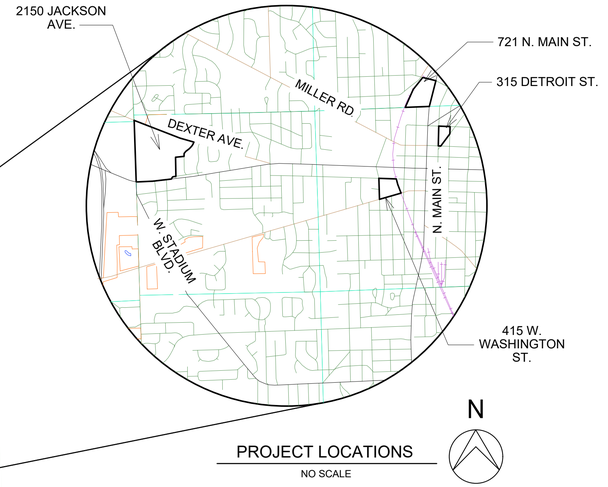
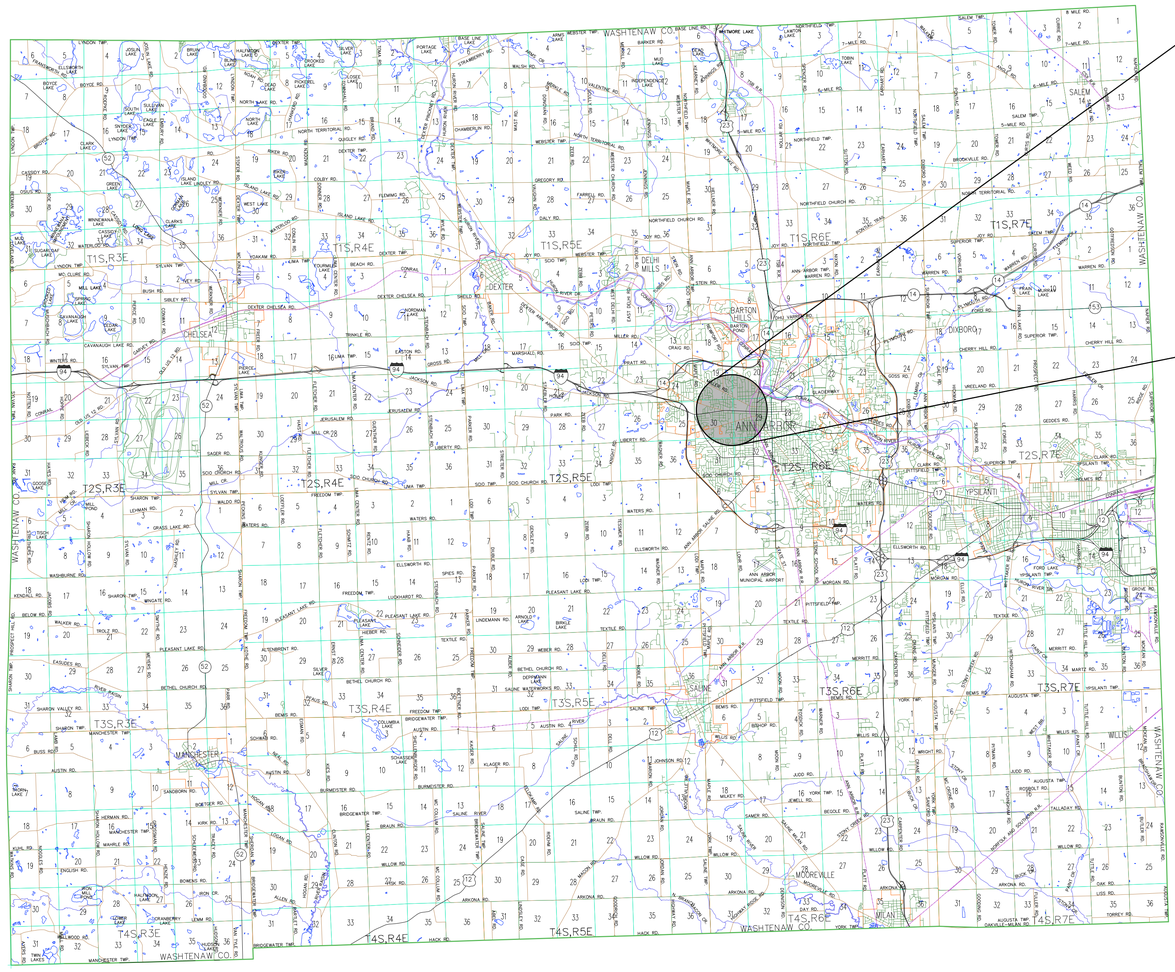
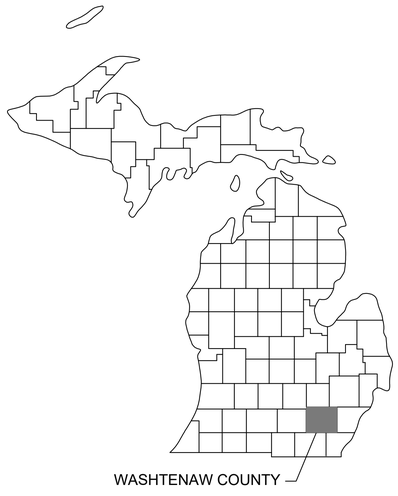
BUILDING DEMOLITION PROJECT
2150 JACKSON, 315 DETROIT, 415 W. WASHINGTON & 721 N. MAIN
CITY OF ANN ARBOR

WASHTENAW COUNTY, MICHIGAN
HRC JOB Nos. 20220118, 20230292, & 20240292



PROJECT LOCATIONS
NO SCALE





N
WASHTENAW COUNTY
NO SCALE

PLAN INDEX — SHEET No.

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NOTICE:
ALL EXISTING UTILITIES SHOWN ON THIS TOPOGRAPHIC SURVEY HAVE BEEN TAKEN FROM VISUAL OBSERVATION AND RECORD MAPPING WHERE AVAILABLE. NO GUARANTEE IS MADE, OR SHOULD BE ASSUMED, AS TO THE COMPLETENESS OR ACCURACY OF THE UTILITIES SHOWN ON THIS DRAWING. PARTIES UTILIZING THIS INFORMATION SHALL FIELD VERIFY THE ACCURACY AND COMPLETENESS PRIOR TO CONSTRUCTION.

811 Know what's **below** **Call** before you dig.

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72 HOURS
(3 WORKING DAYS)
BEFORE YOU DIG
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OR 811
(TOLL FREE)

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CONSULTING ENGINEERS SINCE 1915

555 HULET DRIVE
BLOOMFIELD HILLS, MICH.

P.O. BOX 824
48303 - 0824

PHONE: (248) 454-6300
FAX (1st. Floor): (248) 454-6312
FAX (2nd. Floor): (248) 454-6359
WEB SITE: http: / / www.hrcengr.com

DATE	ISSUED FOR / ADDITIONS / REVISIONS
06/10/24	ISSUED FOR BID
06/03/24	OWNER REVIEW

ORIGINAL PLOT SIZE 24X36

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CITY OF ANN ARBOR - BUILDING DEMOLITION PROJECT – HRC JOB Nos. 20220118, 20230292, AND 20240292

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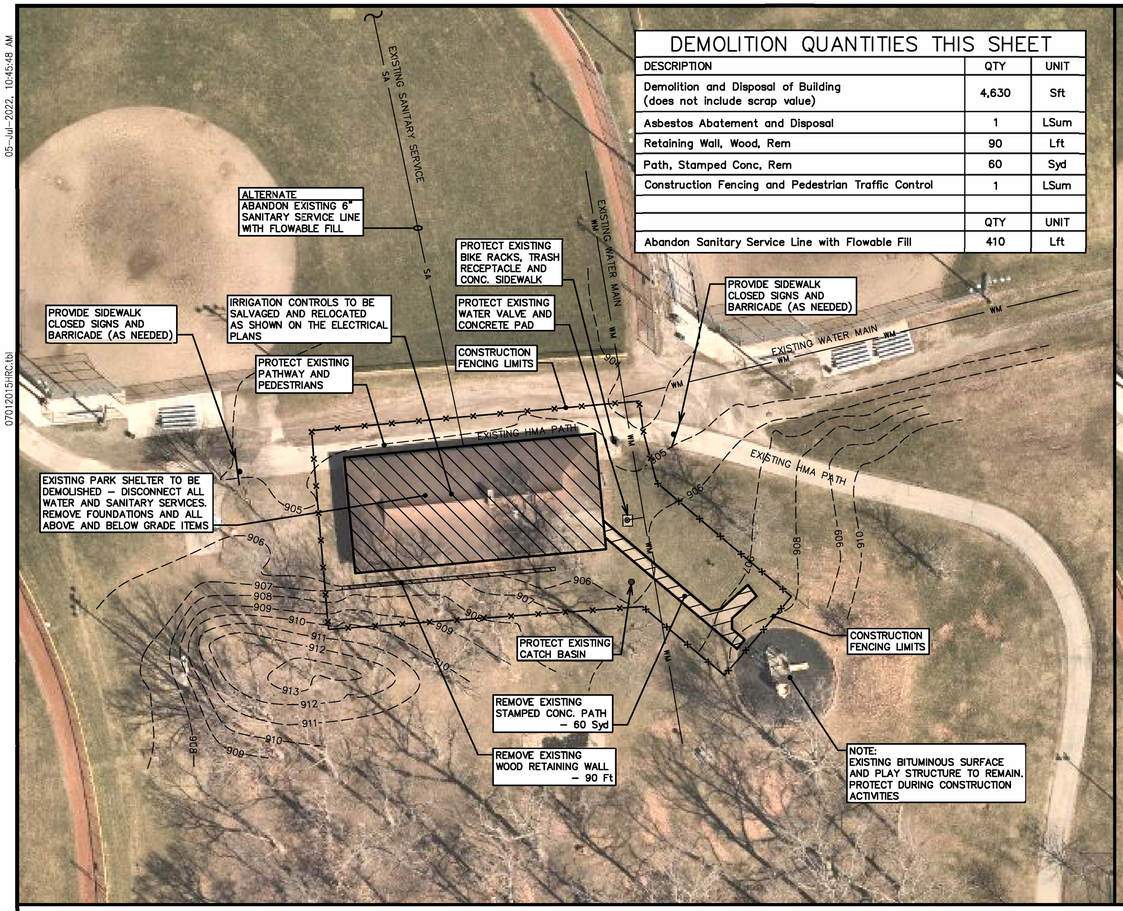
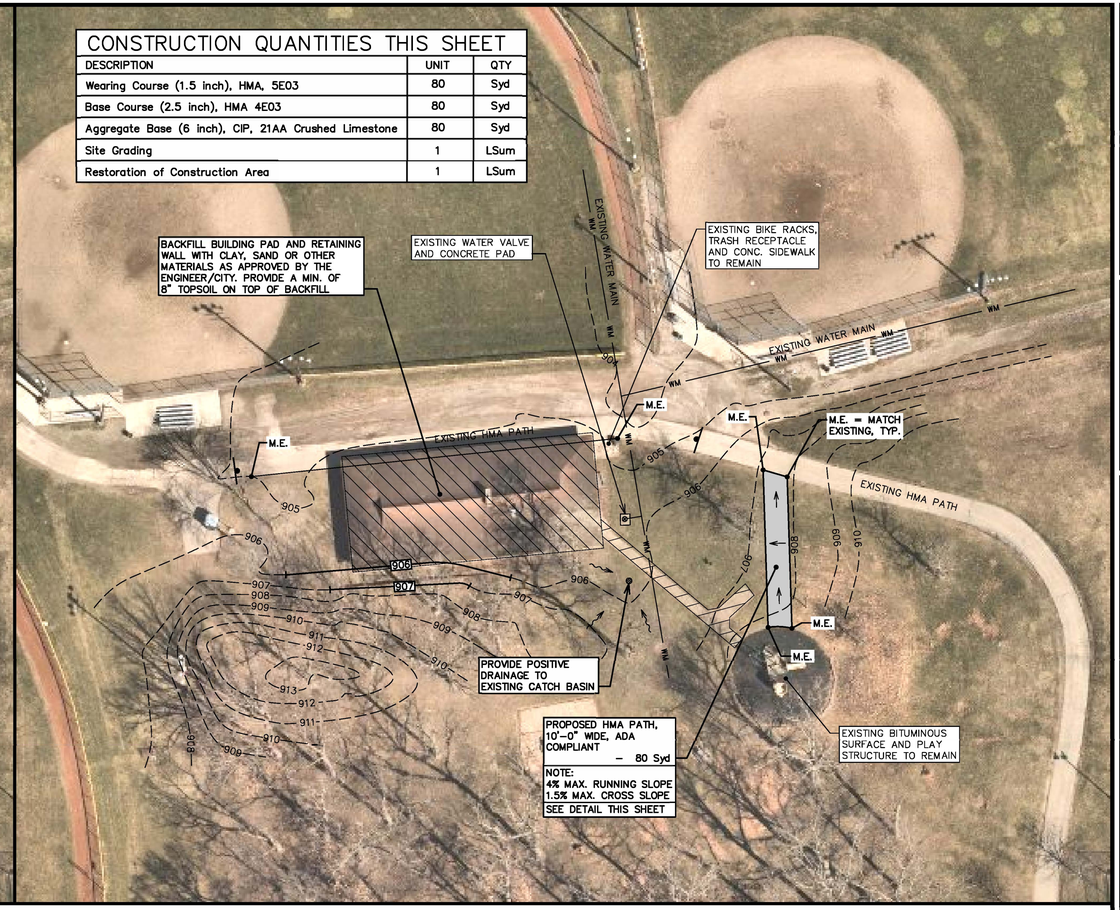
DEMOLITION QUANTITIES THIS SHEET

DESCRIPTION	QTY	UNIT
Demolition and Disposal of Building (does not include scrap value)	4,630	Sft
Asbestos Abatement and Disposal	1	LSum
Retaining Wall, Wood, Rem	90	Lft
Path, Stamped Conc, Rem	60	Syd
Construction Fencing and Pedestrian Traffic Control	1	LSum
	QTY	UNIT
Abandon Sanitary Service Line with Flowable Fill	410	Lft

CONSTRUCTION QUANTITIES THIS SHEET

DESCRIPTION	UNIT	QTY
Wearing Course (1.5 inch), HMA, 5E03	80	Syd
Base Course (2.5 inch), HMA 4E03	80	Syd
Aggregate Base (6 inch), CIP, 21AA Crushed Limestone	80	Syd
Site Grading	1	LSum
Restoration of Construction Area	1	LSum





EXISTING SITE DEMOLITION PLAN

N

0 5 10 30 60

1" = 30'

MISCELLANEOUS QUANTITIES

SEVERAL PAY ITEMS INCLUDED IN THE PROPOSAL ARE NOT SPECIFICALLY SHOWN ON THE PLANS. THESE ITEMS SHALL BE CONSTRUCTED AS DIRECTED BY THE PROJECT ENGINEER OR USED AS NEEDED.

MISCELLANEOUS QUANTITIES

DESCRIPTION	QTY	UNIT
Mobilization, Max 5%	1	LSum
Soil Erosion and Sedimentation Control (incl. permit fees)	1	LSum

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BEFORE YOU DIG
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OR 811
(TOLL FREE)

PLAN LEGEND:

- EXISTING CONTOURS — 911
- PROPOSED CONTOURS — 907
- PROPOSED REMOVALS
- PROPOSED HMA PAVEMENT
- PROPOSED CONSTRUCTION FENCING
- MATCH EXISTING — M.E.
- SIDEWALK CLOSED SIGN
- EXISTING WATER MAIN — WM
- EXISTING WATER VALVE
- EXISTING CATCH BASIN
- EXISTING SANITARY LEAD — SA

CONSTRUCTION NOTES;

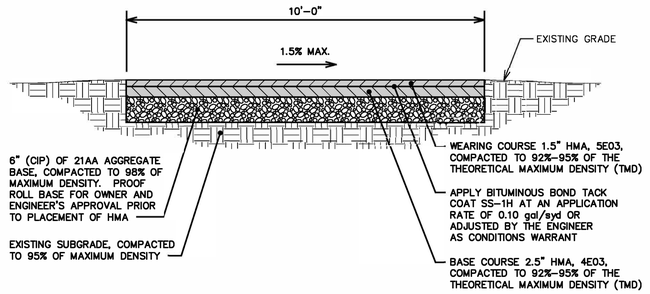
1. CONTRACTOR TO MANAGE PEDESTRIAN TRAFFIC AROUND DEMOLITION AREA. CLOSE ADJACENT PATH DURING CONSTRUCTION. COORDINATE CLOSURES WITH PARK STAFF.
2. CONTRACTOR SHALL PROVIDE 'SIDEWALK CLOSED' SIGNS AND BARRICADES AS REQUIRED.
3. CONTRACTOR SHALL NOT LEAVE AN OPEN HOLE WHEN NOT WORKING. EXCAVATED AREA TO BE COVERED AND FENCED OFF DURING NON–CONSTRUCTION HOURS.
4. CONTRACTOR SHALL PROTECT EXISTING HMA PATH DURING CONSTRUCTION ACTIVITIES. ANY DAMAGE TO THE EXISTING HMA PATH SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.
5. CONTRACTOR SHALL PROTECT ALL TREES DURING CONSTRUCTION ACTIVITIES. NO TREES MAY BE REMOVED WITHOUT PRIOR CONSENT FROM THE OWNER.

CONSTRUCTION SITE PLAN

N

0 5 10 30 60

1" = 30'



TYPICAL CROSS SECTION
HMA, ADA COMPLIANT PATH
NOT TO SCALE

CITY OF ANN ARBOR MICHIGAN

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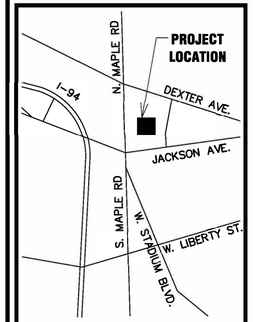
06/10/24	ISSUED FOR BID
09 /06 /23	REISSUED FOR BIDS
07/01/22	ISSUED FOR BIDS
06/07/22	80% OWNER REVIEW
DATE	ISSUED FOR /ADDITIONS / REVISIONS
DESIGNED	R.J.K.
DRAWN	J.A.R.
CHECKED	R.J.K. / J.V.B.
APPROVED	J.F.B.



CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

2150 JACKSON SITE DEMOLITION AND CONSTRUCTION PLAN

HRC JOB NO. 20220118	SCALE 1"=30'
DATE June 2024	SHEET NO. C–1 OF

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N

0 5 10 30 60

1" = 30'

PROJECT AREA – SESC PLAN

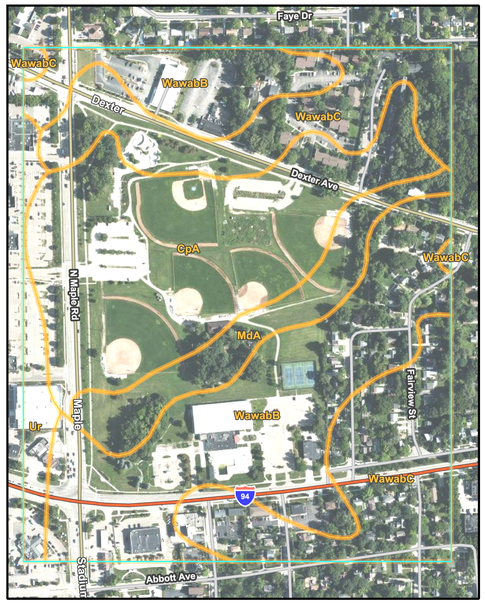
SESC LEGEND:

EROSION CONTROL, SILT FENCE — SF — SF —

EROSION CONTROL, INLET FILTER

LIMITS OF DISTURBANCE

SESC QUANTITIES THIS SHEET (FOR INFORMATIONAL PURPOSES ONLY)		
DESCRIPTION	UNIT	QTY
Erosion Control, Silt Fence	Lft	285
Erosion Control, Inlet Filter	Ea	1



SOILS MAP

N

NOT TO SCALE

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CpA	Conover-Brookston loams, 0 to 2 percent slopes	26.3	27.8%
MdA	Matherton sandy loam, 0 to 4 percent slopes	7.6	8.1%
Ur	Urban land	3.6	3.8%
WawabB	Wawasee loam, 2 to 6 percent slopes	32.1	33.9%
WawabC	Wawasee loam, 6 to 12 percent slopes	25.0	26.4%
Totals for Area of Interest		**94.6**	**100.0%**

NOTE: SOIL SURVEY DATA PER USDA NATIONAL RESOURCES CONSERVATION SURVEY

SEQUENCE OF CONSTRUCTION

PLACE SOIL EROSION CONTROL MEASURES.

DEMOLISH PARK SHELTER.

REMOVE WOOD RETAINING WALL.

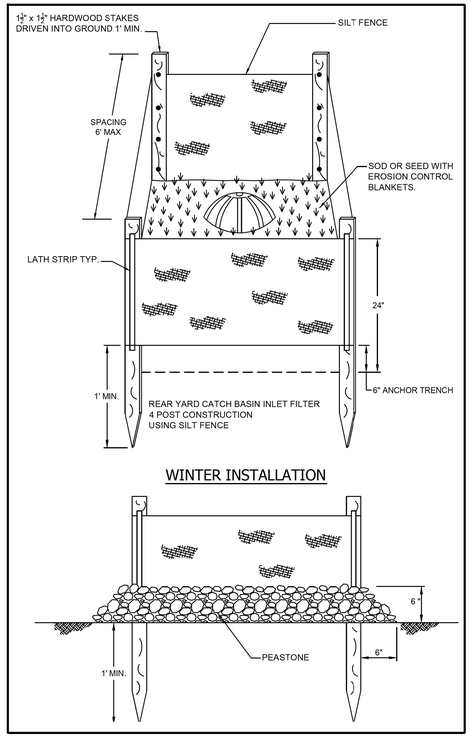
REMOVE STAMPED CONCRETE PATH.

INSTALL NEW HMA PATH.

REGRADE SITE.

SITE RESTORATION WITH TOPSOIL, SEED, MULCH AND/OR SOD.

REMOVE SOIL EROSION CONTROL MEASURES.



INLET FILTER
SCALE: NONE

SOIL EROSION AND SEDIMENTATION CONTROL (SESC) NOTES

GENERAL MAINTENANCE:

CONTRACTOR SHALL CONFORM TO SOIL EROSION AND SEDIMENTATION CONTROL ACT, PART 91 OF ACT No. 451 OF PUBLIC ACTS OF 1994 AS AMENDED, BEING SECTION 324.9101–324.9123 OF MICHIGAN COMPILED LAWS AND TITLE V, CHAPTER 63, CITY OF ANN ARBOR ORDINANCE CODE.

APPROPRIATE SOIL EROSION AND SEDIMENTATION AND CONTROL (SESC) MEASURES SHALL BE IN PLACE PRIOR TO EARTH DISTURBING ACTIVITIES. PLACE TURF ESTABLISHMENT ITEMS AS SOON AS POSSIBLE ON POTENTIAL ERODIBLE SLOPES AS DIRECTED BY THE ENGINEER.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT SESC MEASURES ARE IN PLACE AND MAINTAINED UNTIL THE CONTRACT HAS BEEN COMPLETED AND ACCEPTED MEASURES SHALL BE PAID ONLY ONCE.

TEMPORARY SESC MEASURES SHALL BE INSTALLED, MAINTAINED AND REMOVED BY THE CONTRACTOR.

DAILY MAINTENANCE IS THE CONTRACTOR'S RESPONSIBILITY.

TEMPORARY SESC MEASURES SHALL BE REMOVED AT THE END OF THE PROJECT.

TEMPORARY SESC MEASURES SHALL BE INSTALLED PRIOR TO EARTH DISTURBANCE.

EROSION CONTROL SILT FENCE:

SILT FENCE IS TO BE INSTALLED PER CITY OF ANN ARBOR, PUBLIC SERVICES DEPARTMENT STANDARD SILT FENCE DETAIL, SD–EC–3. SEE DETAIL THIS SHEET.

INSPECT SILT FENCE DAILY AND IMMEDIATELY FOLLOWING EACH RAINFALL.

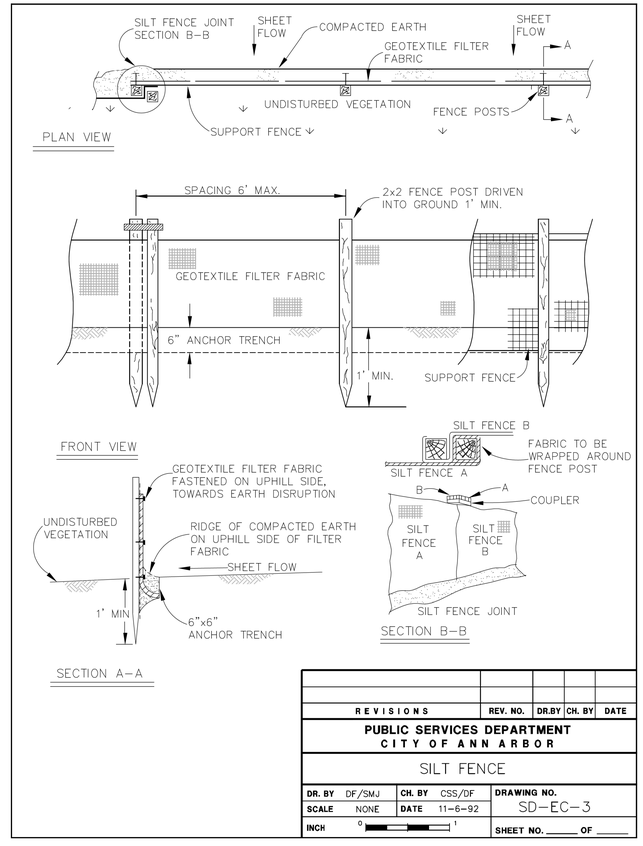
REPAIR SILT FENCE WHEN SAGGING OR HAS BEEN REMOVED/TORN DOWN.

WHEN SILT COLLECTS TO HALF THE HEIGHT OF THE FENCE ALL SILT IS TO BE REMOVED AND FENCE REPAIRED IF DAMAGED.

REMOVE SILT FENCE AT THE END OF CONSTRUCTION AFTER FINAL GRADING AND RESTORATION HAS BEEN COMPLETED.

NEAREST WATER COURSE:

+/– 4,300 Ft TO FIRST SISTER LAKE.



REVISIONS	REV. NO.	DR.BY	CH. BY	DATE

PUBLIC SERVICES DEPARTMENT
CITY OF ANN ARBOR

SILT FENCE

DR. BY	DF/SMJ	CH. BY	CSS/DF
SCALE	NONE	DATE	11–6–92
INCH	0 1		

DRAWING NO. SD–EC–3

SHEET NO. ____ OF ____

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WEB SITE: http: // www.hrcengr.com

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09 /06 /23	REISSUED FOR BIDS
07/01/22	ISSUED FOR BIDS
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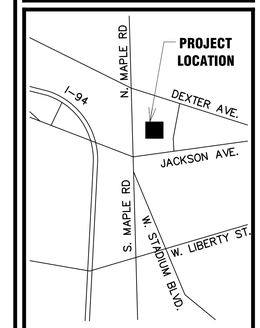

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

SOIL EROSION AND SEDIMENTATION CONTROL PLAN

HRC JOB NO.	SCALE
20220118	AS NOTED
DATE: June 2022	SHEET NO.: C–2

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EXISTING BUILDING TO BE REMOVED IN ITS ENTIRETY

EXISTING SIDEWALK TO PLAY STRUCTURE TO BE REMOVED

EXISTING PAVING FOR BIKE RACK AND TRASH TO REMAIN

EXISTING MANHOLE TO REMAIN - REMOVE WATER LINE FROM BUILDING BACK TO THIS LOCATION AND CAP INSIDE MANHOLE

PHOTO NO. 01

PHOTO NO. 02

REFER TO HAZARDOUS MATERIALS REPORT FOR INFORMATION ON ASBESTOS AND LEAD-BASED PAINT. THESE MATERIALS ARE TO BE ABATED IN ACCORDANCE WITH ALL STATE AND FEDERAL GUIDELINES (TYP.)

EXISTING PLANTER BED WAS REMOVED IN THE PAST - CONTRACTOR TO REMOVE ANY REMAINING BELOW GRADE COMPONENTS

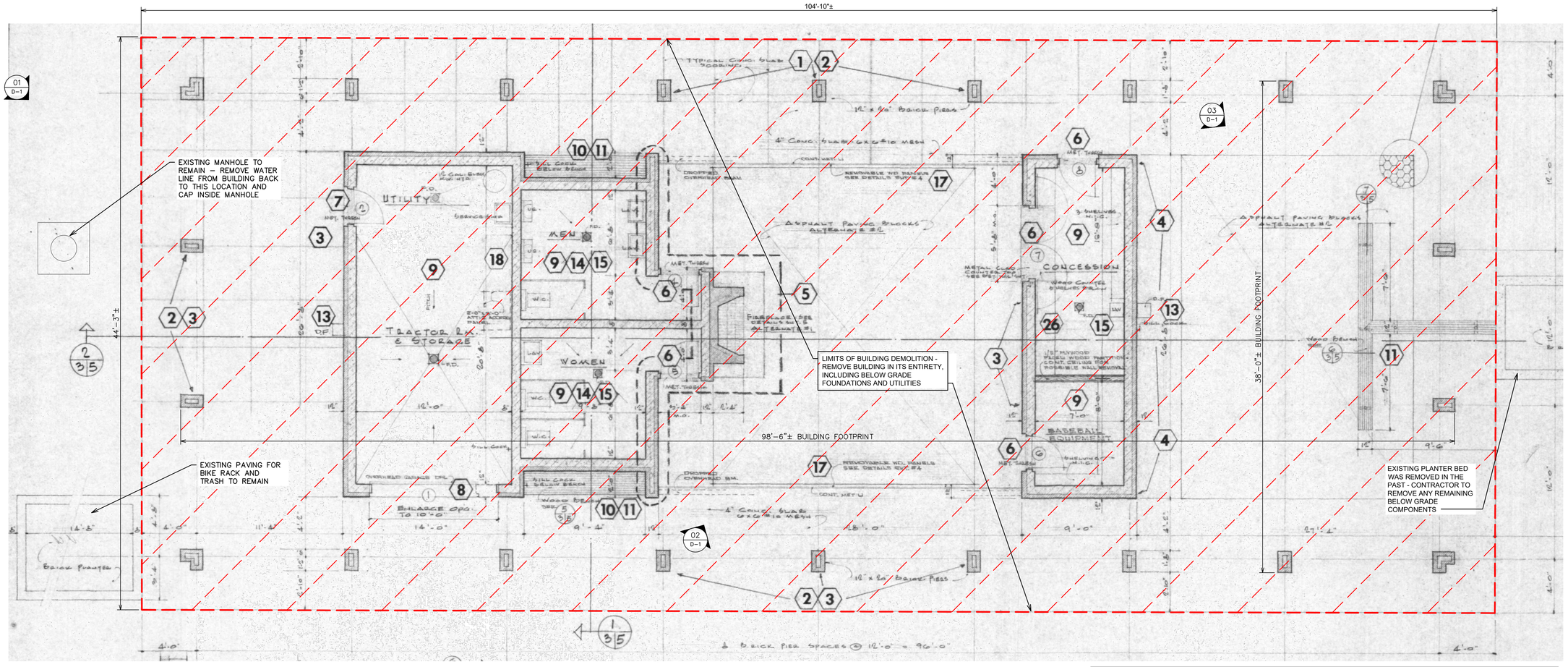
PHOTO NO. 03

EXISTING BUILDING TO BE REMOVED IN ITS ENTIRETY

EXISTING TIMBER RETAINING WALL TO BE REMOVED - REFER TO PLAN SHEET C-1 FOR SITE REGRADING REQUIREMENTS

PHOTO NO. 04

04 D-1



BUILDING DEMOLITION PLAN

SCALE: 1/14" = 1'-0"

N

LEGEND

LIMITS OF BUILDING DEMOLITION

X A-X DENOTES PHOTO NUMBER & SHEET LOCATION

NOTES:

1. DEMOLITION CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UTILITY STUBS TO THE BUILDING AND COORDINATE TERMINATIONS OF LINES AT EDGE OF PROJECT AREA WITH CITY OF ANN ARBOR DPW. ALL UTILITY LINES SHALL BE REMOVED BY THE CONTRACTOR IN THEIR ENTIRETY WITHIN THE LIMITS OF DEMOLITION AREA AFTER THE LEADS HAVE BEEN CAPPED.
2. DEMOLITION CONTRACTOR SHALL SUBMIT TO ENGINEER A PLAN SHOWING A 6'-0" CHAIN LINK PERIMETER FENCE AT DEMOLITION LIMITS AND A SILT FENCE FOR SOIL EROSION AND SEDIMENTATION CONTROL.
3. ALL EXISTING BUILDINGS AND SITE COMPONENTS IN THE VICINITY ARE TO BE PROTECTED FROM DAMAGE.
4. ALL UTILITY INFORMATION IS BASED ON REFERENCE DRAWINGS AND MUST BE FIELD VERIFIED PRIOR TO THE START OF DEMOLITION ACTIVITIES.
5. CONTRACTOR IS TO PROVIDE TEMPORARY POWER AS REQUIRED.
6. REFER TO HAZARDOUS MATERIAL REPORT FOR REMEDIATION REQUIREMENTS AT BUILDING.
7. ALL WORKERS MUST HAVE MIOSHA LEAD IN CONSTRUCTION TRAINING PRIOR TO STARTING WORK.
9. DEMOLITION AND ELECTRICAL PERMITS ARE REQUIRED TO BE OBTAINED WITH THE CITY OF ANN ARBOR AS PART OF THIS WORK SCOPE.

CITY OF ANN ARBOR
FOUNDED 1824 INCORPORATED 1851
MICHIGAN

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06/03/24	OWNER REVIEW

DESIGNED	
DRAWN	
CHECKED	
APPROVED	

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

2150 JACKSON
VETERAN'S PARK SHELTER
BUILDING DEMOLITION PLAN

HRC JOB NO.	SCALE
20220118	1/4"=1'-0"
DATE: June 2024	SHEET NO.: D-1 OF

V:\20220118\A\001_Plot.dwg
Melchior, Adrianna M.
ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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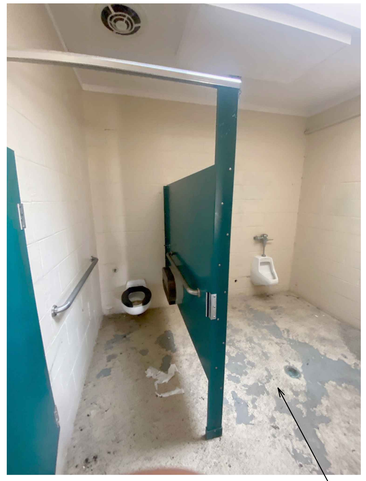

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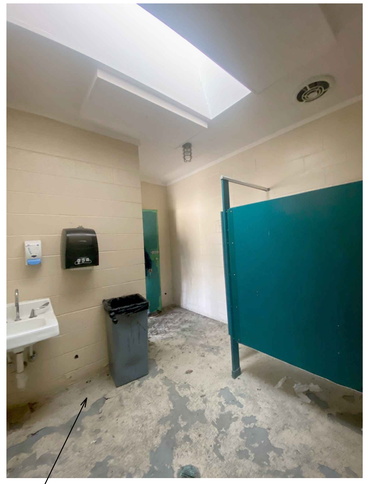


PHOTO NO. 02

ALL BUILDING COMPONENTS TO BE REMOVED IN THEIR ENTIRETY - TYPICAL

PHOTO NO. 03

PHOTO NO. 04

ALL BUILDING COMPONENTS TO BE REMOVED IN THEIR ENTIRETY - TYPICAL

PHOTO NO. 05

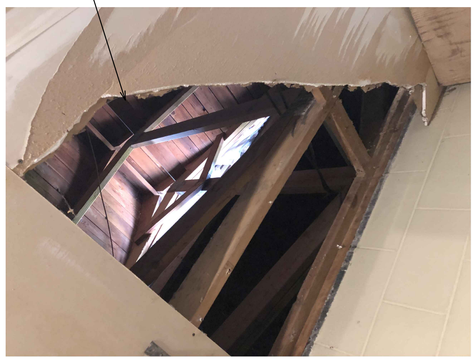
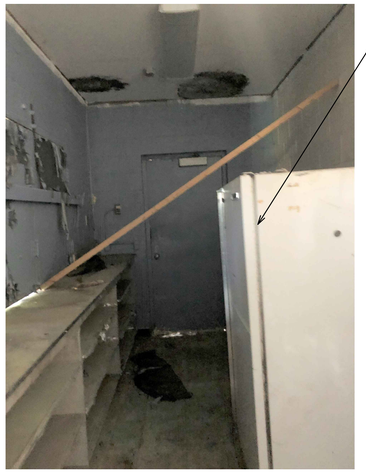


PHOTO NO. 06



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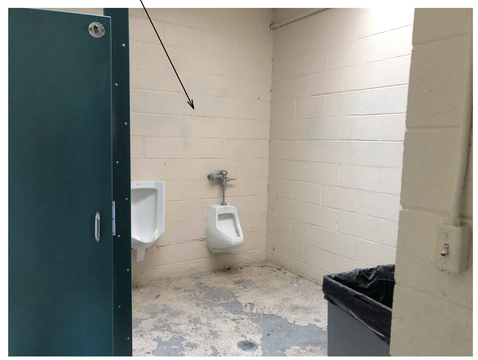
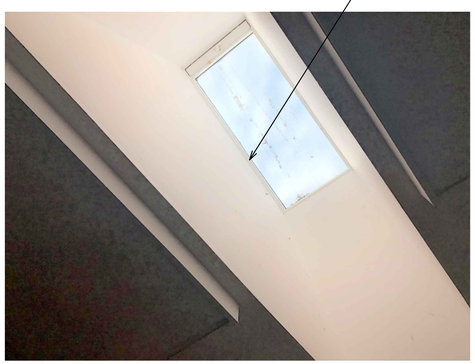


PHOTO NO. 08

ALL BUILDING COMPONENTS TO BE REMOVED IN THEIR ENTIRETY - TYPICAL



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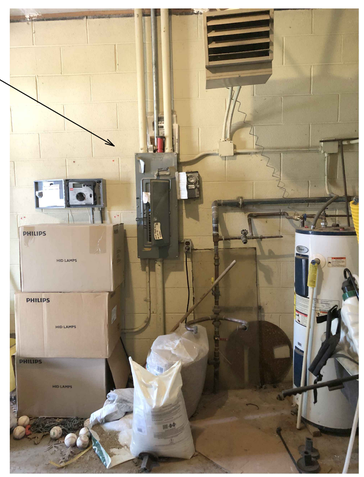

PHOTO NO. 10

CITY OF ANN ARBOR
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CHECKED	
APPROVED	

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

2150 JACKSON
VETERAN'S PARK SHELTER
REFERENCE PHOTOS

HRC JOB NO.	SCALE
20220118	NONE
DATE: May 2024	SHEET NO.: D-2 OF

V:\2022\01\20220118\A\D02_Photo.dwg
Melchior, Adrianna M.
ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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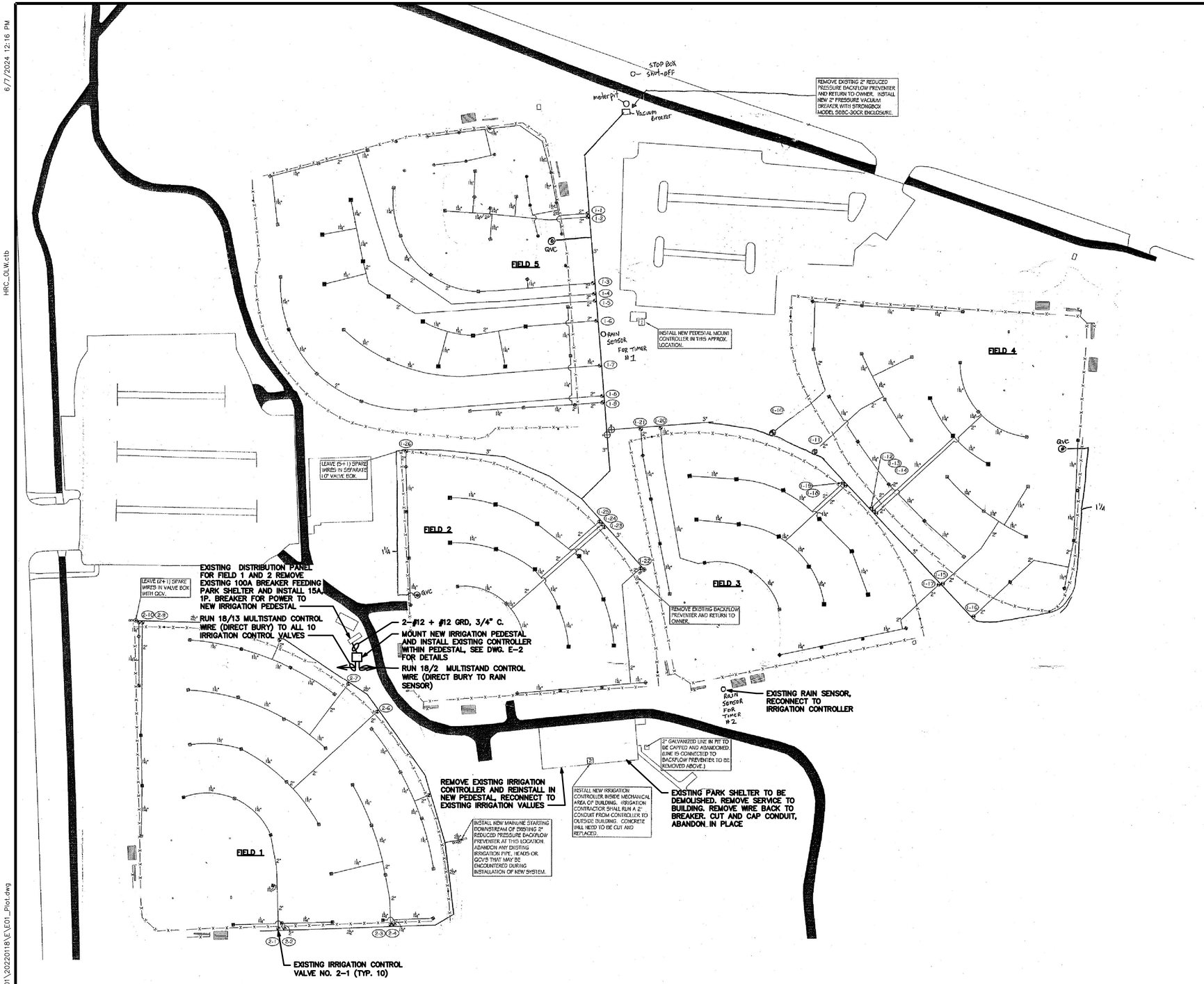

EXISTING ELECTRICAL SITE PLAN WITH PROPOSED MODIFICATIONS

N.T.S.

N

ELECTRICAL QUANTITIES THIS SHEET		
DESCRIPTION	QTY	UNIT
Ball Diamond New Irrigation Piping and System Updates	1	LSum
Ball Diamond New Irrigation System Controls and Electrical	1	LSum

GENERAL ELECTRICAL NOTES:

(APPLY TO ALL DRAWINGS)

1. THE CONTRACTOR SHALL VISIT THE JOB SITE AND THOROUGHLY CHECK THE FIELD CONDITIONS AND THE EXISTING ELECTRICAL INSTALLATION AND UTILITIES PRIOR TO SUBMITTING HIS BID.
2. OTHER PROJECTS ARE, OR MAY BE, UNDER CONSTRUCTION AT THIS SITE, AND THIS CONTRACTOR SHALL COORDINATE WITH THEM SO AS NOT TO DELAY THEIR SCHEDULES OR IMPEDE THEIR WORK.
3. COORDINATE ALL NEW ELECTRICAL UNDERGROUND WORK WITH NEW AND EXISTING UNDERGROUND UTILITIES BEFORE INSTALLATION. SEE DRAWINGS
4. ALL UNDERGROUND CONDUITS BE P.V.C., EXCEPT WHERE ENTERING STRUCTURES. UNDERGROUND CONDUITS SHALL BE RIGID GALVANIZED STEEL WITHIN 5'-0" OF THE STRUCTURE.
5. PROVIDE WATERTIGHT HUBS AT CONDUIT ENTRANCES TO ALL ENCLOSURES MOUNTED OUTDOORS AND AT ALL NEMA TYPE 4 & 4X ENCLOSURES SHALL BE EQUIPPED WITH A DRAIN/BREATHER FITTING.
6. ALL POWER FEEDERS SHALL BE RUN IN INDIVIDUAL CONDUITS, FROM SOURCE TO LOAD, AS INDICATED IN SCHEDULES, WIRING DIAGRAMS, OR BY HOME RUNS ON THE PLANS.
7. GROUND CONDUCTOR SPLICING AND BONDING SHALL BE ACCOMPLISHED BY THE USE OF EXOTHERMIC WELDING.
8. PROVIDE A GREEN GROUND CONDUCTOR IN ALL SYSTEMS CONDUITS, EXCEPT INSTRUMENT SIGNAL AND ALARM CONDUITS, INCLUDING BRANCH CIRCUIT CONDUITS FOR LIGHTING AND RECEPTACLES. GROUND CONDUCTOR SIZING SHALL BE PER N.E.C. TABLE 250.122 (MINIMUM) WHERE NOT SIZED ON THE DRAWINGS.
9. ALL THREADED MECHANICAL CONNECTIONS ON ELECTRICAL EQUIPMENT (CONDUIT, COUPLINGS, JUNCTION BOXES, ETC.) INSTALLED OUTDOORS SHALL BE COATED WITH ANTI-SEIZE COMPOUND PRIOR TO INSTALLATION.
10. IN AREAS WITH EXISTING TREES, THE CONTRACTOR SHALL CAREFULLY EXCAVATE THE CONDUIT RUNS SO AS NOT TO DAMAGE MAIN ROOTS OF TREES. DO NOT CUT OR REMOVE MAIN ROOTS OF TREES, BUT RUN CONDUIT AROUND ROOTS AS MAY BE REQUIRED BY FIELD CONDITIONS.
11. IN AREAS WHERE ELECTRICAL WORK DISTURBS EXISTING SOD, GROUND SHALL BE REGRADED AS REQUIRED AND SOD SHALL BE REPAIRED OR REPLACED, AS REQUIRED, TO RETURN THE SITE TO A CONDITION MEETING OR EXCEEDING THAT PRIOR TO THE BEGINNING OF WORK.
12. ALL SALVAGED MATERIALS SHALL BE TURNED OVER TO THE OWNER OR DISPOSED OF AS DIRECTED BY THE OWNER.

THIS DRAWING HAS BEEN COPIED FROM A PREVIOUS CONSTRUCTION PROJECT AND IS PROVIDED FOR INFORMATION ONLY. THIS DRAWING HAS BEEN REDUCED AND IS THEREFORE NOT TO SCALE, NO GUARANTEE IS MADE, OR SHOULD BE ASSUMED, AS TO THE COMPLETENESS OR ACCURACY OF THE INFORMATION SHOWN ON THIS DRAWING. PARTIES UTILIZING THIS INFORMATION SHALL FIELD VERIFY THE ACCURACY AND COMPLETENESS PRIOR TO CONSTRUCTION ACTIVITIES.

CITY OF ANN ARBOR
FOUNDED 1824
INCORPORATED 1851
MICHIGAN

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WEB SITE: www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
06/10/24	ISSUED FOR BID
06/03/24	OWNER REVIEW

DESIGNED	MJR
DRAWN	KLB
CHECKED	MJR
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

2150 JACKSON
ELECTRICAL SITE PLAN

HRC JOB NO. 20220118	SCALE N.T.S.
DATE June 2022	SHEET NO. E-1 OF

Melchior, Adrianna M.
V:\2022\01\20220118\E\E01_Plot.dwg
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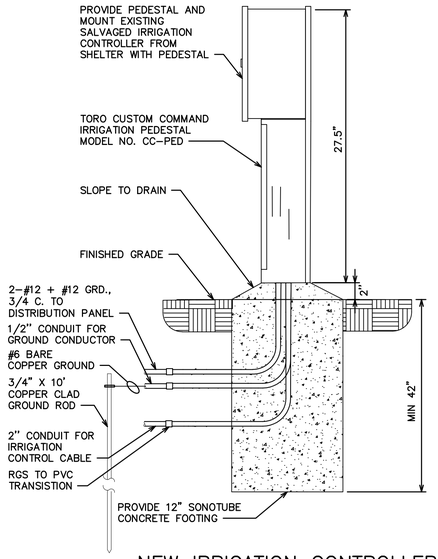

NEW IRRIGATION CONTROLLER PEDESTAL DETAIL

N.T.S.

NOTE: LOCATE NEW IRRIGATION CONTROLLER PEDESTAL AS SHOWN ON SHEET E-1. COORDINATE EXACT LOCATION WITH PARK STAFF.

PHOTO 1

PHOTO 2

CITY OF ANN ARBOR
FOUNDED 1824
INCORPORATED 1851
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CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

2150 JACKSON
ELECTRICAL DETAILS

HRC JOB NO. 20220118	SCALE N.T.S.
DATE June 2022	SHEET NO. E-2 OF

Melchior, Adrianna M.
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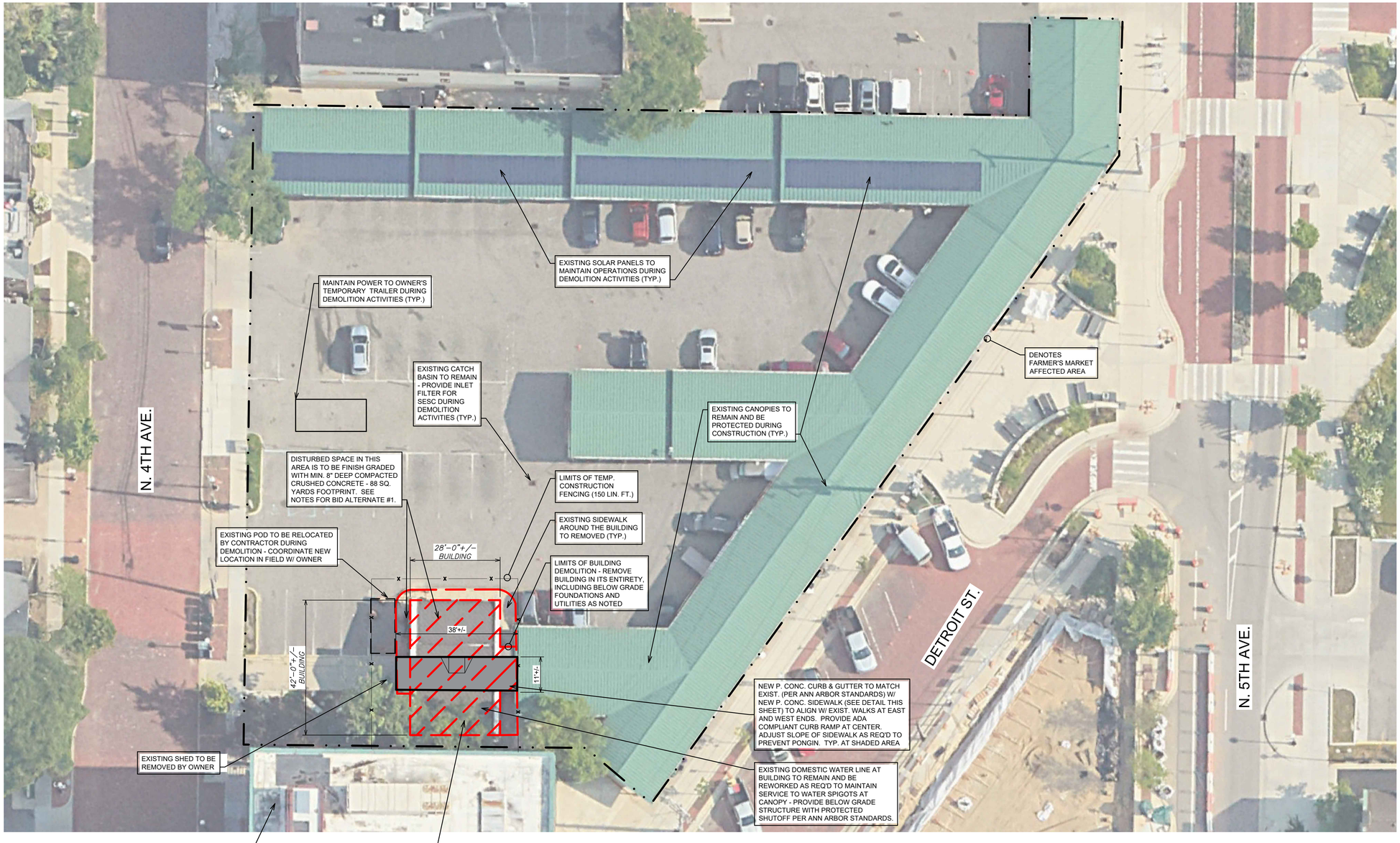
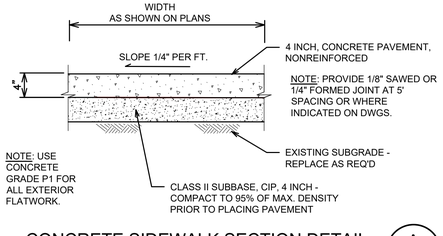


BUILDING DEMOLITION PLAN

SCALE: 1/16" = 1'-0"

N

NOTE: MAX 1:20 IN WALKING DIRECTION AND 1:48 FOR CROSS SLOPE



CONCRETE SIDEWALK SECTION DETAIL

NO SCALE

A / D-3

LEGEND

LIMITS OF BUILDING DEMOLITION

X / A-X — DENOTES PHOTO NUMBER & SHEET LOCATION

GENERAL NOTES:

1. DEMOLITION CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UTILITY STUBS TO THE BUILDING AND COORDINATE TERMINATIONS OF LINES AT EDGE OF PROJECT AREA WITH CITY OF ANN ARBOR DPW. ALL UTILITY LINES AS NOTED SHALL BE REMOVED BY THE CONTRACTOR IN THEIR ENTIRETY WITHIN THE LIMITS OF DEMOLITION AREA AFTER THE LEADS HAVE BEEN CAPPED.
2. DEMOLITION CONTRACTOR SHALL SUBMIT TO ENGINEER A PLAN SHOWING A 6'-0" CHAIN LINK PERIMETER FENCE AT DEMOLITION LIMITS AND A SILT FENCE FOR SOIL EROSION AND SEDIMENTATION CONTROL.
3. ALL EXISTING BUILDINGS AND SITE COMPONENTS IN THE VICINITY ARE TO BE PROTECTED FROM DAMAGE.
4. ALL UTILITY INFORMATION IS BASED ON REFERENCE DRAWINGS AND MUST BE FIELD VERIFIED PRIOR TO THE START OF DEMOLITION ACTIVITIES.
5. CONTRACTOR IS TO PROVIDE TEMPORARY POWER AS REQUIRED.
6. REFER TO HAZARDOUS MATERIAL REPORT FOR REMEDIATION REQUIREMENTS AT BUILDING.
7. ALL WORKERS MUST HAVE MIOSHA LEAD IN CONSTRUCTION TRAINING PRIOR TO STARTING WORK.
8. PROVIDE PEDESTRIAN PROTECTION DURING DEMOLITION ACTIVITIES PER MICHIGAN BUILDING CODE SECTIONS 3303 AND 3306.
9. DEMOLITION, ELECTRICAL AND PLUMBING PERMITS ARE REQUIRED TO BE OBTAINED WITH THE CITY OF ANN ARBOR AS PART OF THIS WORK SCOPE.

PROJECT NOTES:

1. DEMOLITION WORK AT THIS SITE IS PERMITTED TO TAKE PLACE BETWEEN THE MONTHS OF JANUARY AND APRIL, BUT NOT ON SATURDAYS OR SUNDAYS.
2. THE ENTIRE BUILDING, INCLUDING FOUNDATIONS AND ADJACENT SIDEWALKS & APPURTENANCES AS NOTED, ARE TO BE REMOVED IN THEIR ENTIRETY.
2. SANITARY LEAD AT BUILDING TO BE REMOVED AND CAPPED AT THE EDGE OF THE EXCAVATION.
3. WATER LEAD AT BUILDING TO BE REWORKED AS NOTED TO MAINTAIN WATER SERVICE TO CANOPY SPIGOTS. CONTRACTOR WILL BE PERMITTED TO USE THE EXISTING WATER SERVICE FOR DEMOLITION ACTIVITIES.
4. STORM DRAIN LINES CONNECTED TO BUILDING ARE TO BE REMOVED AND CAPPED AT THE EDGE OF THE EXCAVATION.
5. ELECTRICAL SERVICE AND FIBER LINES AT BUILDING TO BE RELOCATED TO NEW OUTDOOR RACK PER ELECTRICAL SHEETS AS NOTED TO MAINTAIN ELECTRICAL SERVICE TO LIGHTING AND OUTLETS AT CANOPIES.
6. **BID ALTERNATE #1: IN LIEU OF CRUSHED CONCRETE BACKFILL AT DEMOLITION FOOTPRINT AREA, PROVIDE HMA PAVING PER CITY OF ANN ARBOR STANDARDS AND MATCHING EXISTING ADJACENT PARKING LOT CONSTRUCTION. ASSUME 4" OF HMA OVER 8" OF 21AA BASE FOR PRICING PURPOSES. CONFIRM CONSTRUCTION IN FIELD PRIOR TO STARTING.**

CITY OF ANN ARBOR
MICHIGAN
FOUNDED 1824
INCORPORATED 1851

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06/03/24	OWNER REVIEW
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DESIGNED	AMM
DRAWN	AG
CHECKED	AMM
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

FARMER'S MARKET DEMOLITION PLAN

HRC JOB NO. 20230292	SCALE AS NOTED
DATE June 2024	SHEET NO. D-3 OF

Melchior, Adrianna M.
V:\2023\20230292\A\Sheets\03_Plot.dwg
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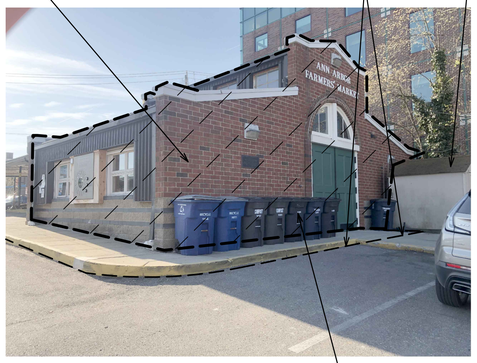
EXISTING ADJACENT BUILDING TO REMAIN AND BE PROTECTED DURING CONSTRUCTION (TYP.)

EXISTING BUILDING TO BE REMOVED IN ITS ENTIRETY

PHOTO NO. 01

NEW FINISHED SURFACING TO ALIGN WITH REMAINING SIDEWALKS, CURB RAMPS AND TOP EDGES OF EXISTING CURBS (TYP.)

EXISTING SHED TO BE REMOVED BY OWNER



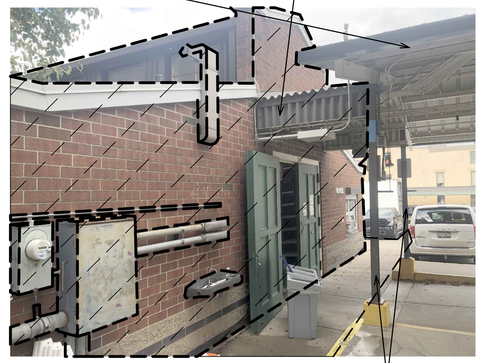
TRASH CANS TO BE RELOCATED BY OWNER (TYP.)

PHOTO NO. 02

EXISTING MARKET CANOPY TO REMAIN AND BE PROTECTED (TYP.)

PHOTO NO. 03

END SECTION OF CANOPY AT BUILDING TO BE CAREFULLY REMOVED - PROVIDE NEW GALV. AND PAINTED STEEL PLATES TO COVER REMOVED ANCHORS AT EXISTING REMAINING CANOPY POSTS FOR CLEAN, FINISHED APPEARANCE



EXISTING CANOPY COLUMNS TO REMAIN AND BE PROTECTED

PHOTO NO. 04

NEW FINISHED SURFACING TO ALIGN WITH REMAINING SIDEWALKS, CURB RAMPS AND TOP EDGES OF EXISTING CURBS (TYP.)

EXISTING SIDEWALK AROUND STRUCTURE TO BE REMOVED (TYP.)

EXISTING STORM DRAIN LINE TO BE REMOVED TO EDGE OF EXCAVATION AND CAPPED (TYP.)

EXISTING ADJACENT SIDEWALK TO REMAIN AND BE PROTECTED (TYP.)

PHOTO NO. 05

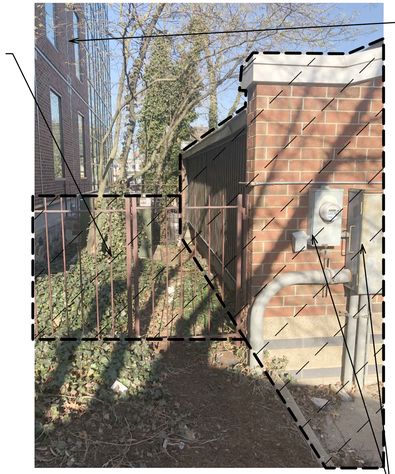
EXISTING DOMESTIC WATER LINE AT BUILDING TO REMAIN AND BE REWORKED AS REQ'D TO MAINTAIN SERVICE TO WATER SPIGOTS AT CANOPY - PROVIDE NEW CONTROL VALVE AT BELOW GRADE VAULT (BELOW FROST LINE) WITH CAST IRON COVER PLATE AT GRADE PER ANN ARBOR STANDARDS. VERIFY EXACT LOCATION OF VAULT W/ OWNER DURING DEMOLITION. PROVIDE SUBMITTAL FOR REVIEW AND APPROVAL ON ALL COMPONENTS.

PHOTO NO. 06

PROVIDE COMPACTED BACKFILL AND CRUSHED CONCRETE TO LIMITS OF EXCAVATION - ALIGN WITH EXISTING ADJACENT SURFACES (TYP.)

EXISTING FENCE TO BE REMOVED

EXISTING ADJACENT BUILDING TO REMAIN AND BE PROTECTED DURING CONSTRUCTION (TYP.)



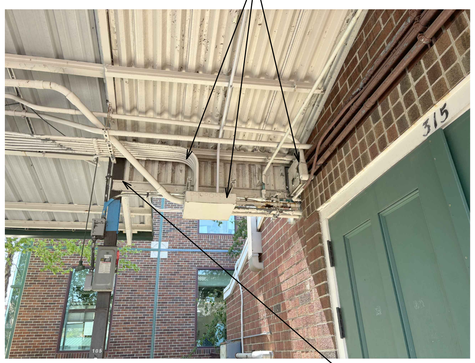
EXISTING ELECTRICAL SERVICE TO BE RELOCATED - REFER TO ELECTRICAL DWGS.

PHOTO NO. 07

EXISTING SOLAR PANEL & EQUIPMENT TO BE RELOCATED BY OWNER - COORDINATE REMOVAL DURING DEMOLITION ACTIVITIES

PHOTO NO. 08

EXISTING ELECTRICAL CONDUIT & INFRASTRUCTURE TO BE REWORKED AS REQ'D TO MAINTAIN POWER TO CANOPIES AND EXISTING SITE ELEMENTS - REFER TO ELECTRICAL SHEETS



SAWCUT EXISTING FRAMING AND GRIND FLUSH WITH EXISTING COLUMNS - PAINT ALL EXPOSED SURFACES TO MATCH EXISTING FOR NEAT APPEARANCE (STEEL TO BE PAINTED WITHIN 24 HOURS OF SAWCUTTING TO PREVENT RUST)

PHOTO NO. 09

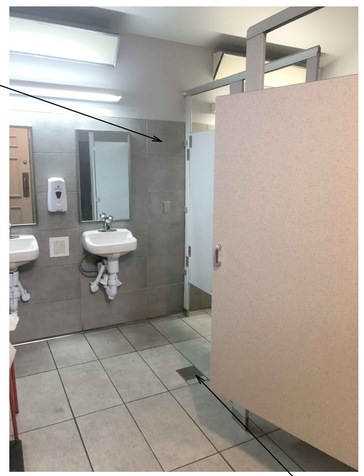
EXISTING SOLAR CONTROL STATION TO BE RELOCATED TO NEW ELECTRICAL RACK - COORDINATE REQ'MNTS. & REMOVAL TIMING DURING DEMOLITION ACTIVITIES

PHOTO NO. 10

NOTE: PROVIDE SEPARATE RACK FOR REMOUNTING SOLAR PANEL CONTROLS (SIM. TO PROPOSED NEW RACK FOR RELOCATING ELECT. EQUIP.) - VERIFY EXACT LOCATION ON SITE WITH OWNER

ALL INTERIOR CONSTRUCTION TO BE REMOVED AT BUILDING (TYP.)

PHOTO NO. 11



EXISTING SANITARY LINES TO BE REMOVED TO EDGE OF EXCAVATION & CAPPED (TYP.)

PHOTO NO. 12

CITY OF ANN ARBOR
MICHIGAN
FOUNDED 1824
INCORPORATED 1851

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WEB SITE: www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
06/10/24	ISSUED FOR BID
06/03/24	OWNER REVIEW

DESIGNED	AMM
DRAWN	AG
CHECKED	AMM
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

FARMER'S MARKET
REFERENCE PHOTOS

HRC JOB NO. 20230292	SCALE NONE
DATE June 2024	SHEET NO. D-4 OF

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Melchior, Adrianna M.
ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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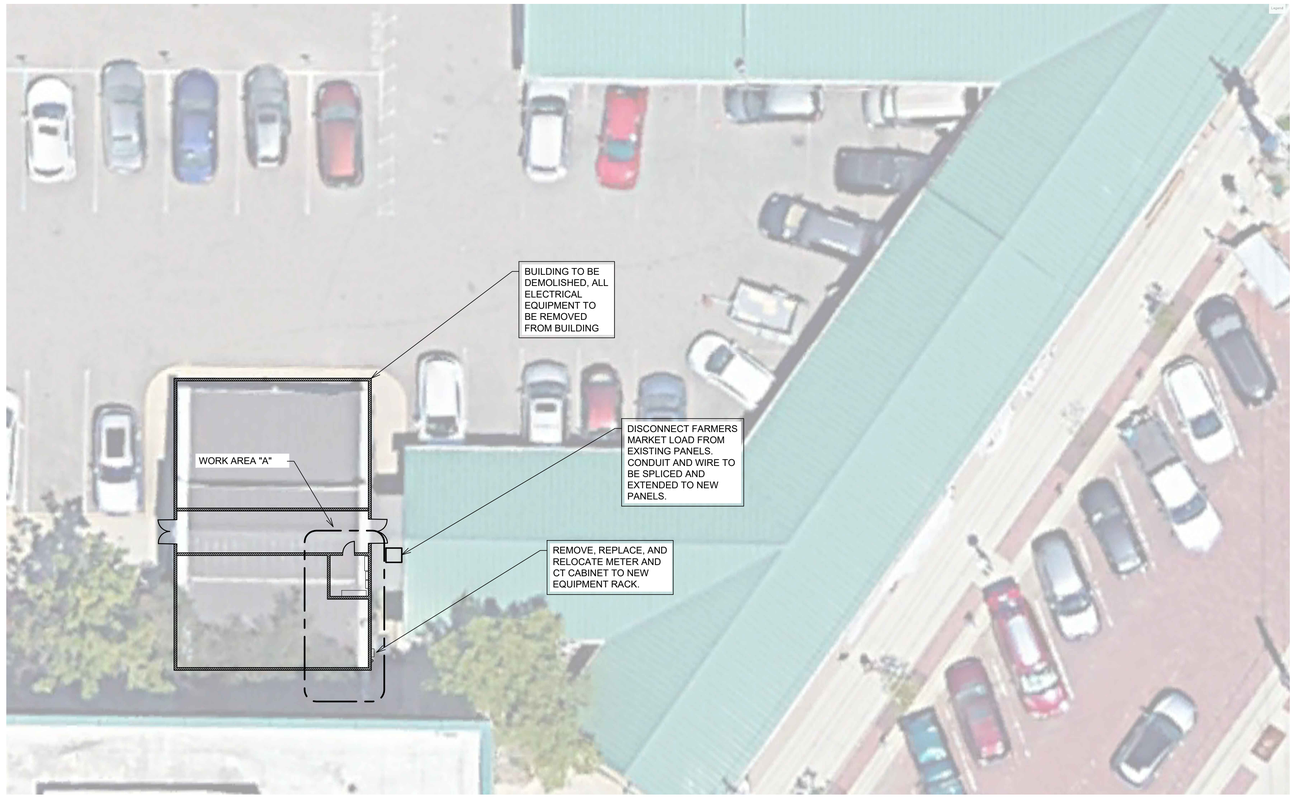
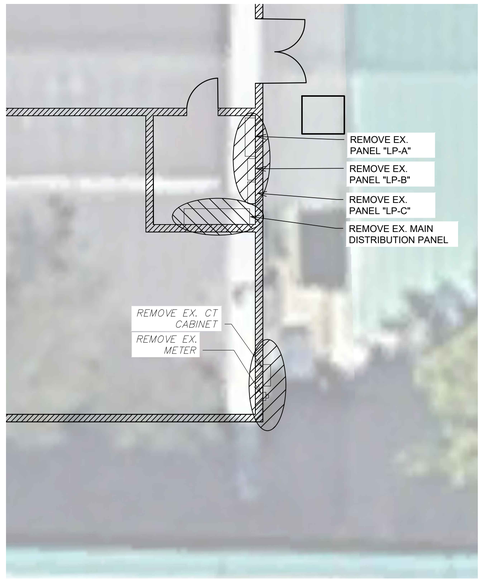


ELECTRICAL SITE PLAN REMOVAL

SCALE: 3/32" = 1'-0"

0 2 4 8 16 24

N



WORK AREA "A"

SCALE: 1/4" = 1'-0"

0 1 2 4 8

N

CITY OF ANN ARBOR
FOUNDED 1824
INCORPORATED 1851
MICHIGAN

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06/03/24	OWNER REVIEW

DESIGNED	MJR
DRAWN	DJK
CHECKED	MJR
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

315 DETROIT ST
ELECTRICAL DEMOLITION PLAN

HRC JOB NO.	SCALE
20240292	AS NOTED
DATE: June 2024	SHEET NO. DE-1 OF

Kitoyama, Denali J.
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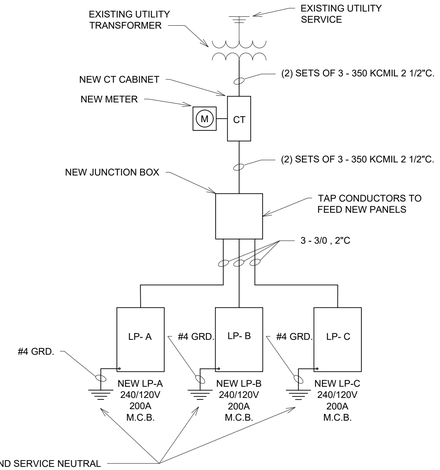

REVISED ONE-LINE DIAGRAM

ELECTRICAL GENERAL NOTES AND SPECIFICATIONS:

(APPLIES TO E-3 THROUGH E-7 DRAWINGS)

GENERAL NOTES

1. OBTAIN AND PAY FOR ALL PERMITS, LICENSES, INSPECTIONS, APPROVALS AND FEES REQUIRED AND ENSURE THAT THE ENTIRE ELECTRICAL INSTALLATION CONFORMS TO CODES AND REGULATIONS REQUIRED BY AUTHORITY OR AGENCY HAVING JURISDICTION OVER THE INSTALLATION, ALTERATION OR CONSTRUCTION OF WORK INCLUDED. ALL FEES SHALL BE INCLUDED IN THE BASE PROPOSAL.
2. ALL ELECTRICAL WORK SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (N.E.C.), N.F.P.A., O.S.H.A., LOCAL AND STATE CODES, ORDINANCES AND REGULATIONS.
3. COORDINATE ALL UNDERGROUND WORK WITH NEW AND EXISTING UNDERGROUND UTILITIES PRIOR TO EXCAVATION. CALL MISS DIG 1-800-482-7171 72 HOURS BEFORE ANY UNDERGROUND WORK IS DONE.
4. THE CONTRACTOR SHALL PAY ALL UTILITY COMPANY COSTS AND FEES ASSOCIATED WITH THE INSTALLATION AND CONNECTION OF NEW ELECTRICAL SERVICES AND REMOVAL OF EQUIPMENT ASSOCIATED WITH DISCONTINUED SERVICES, INCLUDING TEMPORARY CONSTRUCTION SERVICES.
5. ALL POWER WIRING 120 VOLTS AND GREATER SHALL BE INSTALLED IN CONDUIT AND SHALL BE NEW. UNLESS NOTED OTHERWISE, ELECTRICAL METALLIC TUBING SHALL BE USED WHERE CONDUIT IS EXPOSED. PVC SCHEDULE 40 CONDUIT SHALL BE USED UNDERGROUND.
6. ALL UNDERGROUND CONDUITS SHALL BE INSTALLED A MINIMUM OF 30" BELOW FINISHED GRADE. EXPANSION FITTINGS SHALL BE PROVIDED AT ALL TRANSITIONS FROM UNDERGROUND TO EXPOSED CONDUIT.
7. ALL EMPTY CONDUITS SHALL BE PROVIDED WITH A 1/4" DIA. POLYPROPYLENE FISHLINE.
8. ALL CONDUITS SHALL BE ROUTED TO AVOID OPENINGS IN FLOORS, ROOFS, AND WALLS. LADDERS UP WALLS SHALL NOT BE CROSSED BY EXPOSED CONDUIT RUNS. PROVIDE THE MINIMUM CLEAR SPACE REQUIRED BY ALL GOVERNING CODES BETWEEN HANDRAILS AND ALL ELECTRICAL ENCLOSURES AND RACEWAYS, WHICH IN NO CASE SHALL BE LESS THAN 1 1/2" CLEAR.
9. ALL ELECTRICAL FLOOR MOUNTED EQUIPMENT SUCH AS MOTORS, CONTROL PANELS AND METALLIC SUPPORT RACKS SHALL HAVE A MIMIMUM #2 BARE COPPER GROUND CONDUCTOR BETWEEN THE MOTOR, FRAME, ENCLOSURE, OR SUPPORT LEG AND THE BUILDING GROUND SYSTEM.
10. ALL MATERIALS USED SHALL BE NEW AND BEAR THE U.L. LABEL WHERE SUCH SERVICE AND LABEL ARE REGULARLY PROVIDED AND BE OF THE APPROPRIATE NEMA STANDARD.
11. THE CONTRACTOR SHALL FURNISH ALL MATERIALS AND LABOR AS INDICATED ON PLANS AND AS REQUIRED FOR A COMPLETE, REVISED ELECTRICAL SYSTEM.
12. ALL THREADED ELECTRICAL EQUIPMENT (CONDUIT, FITTINGS, BOLTS, SCREWS, ETC.) INSTALLED OUTDOORS SHALL BE COATED WITH ANTI-SEIZE COMPOUND PRIOR TO INSTALLATION. ALL HARDWARE SHALL BE STAINLESS STEEL.
13. EACH OF THE SPECIFIED EQUIPMENT SHALL BE SUBMITTED FOR APPROVAL BY REFERENCE TO MANUFACTURER AND SPECIFIC CATALOG AND MODEL NUMBER.
14. THE CONTRACTOR SHALL VISIT THE JOB SITE, THOROUGHLY CHECK THE EXISTING FIELD CONDITIONS AND EXISTING ELECTRICAL INSTALLATIONS, AND CLARIFY ALL DISCREPANCIES WITH THE ENGINEER BEFORE SUBMITTING A BID, AS NO EXTRAS WILL BE ALLOWED FOR OMITTED WORK DUE TO FAILURE TO INSPECT THE PREMISES.
15. ON COMPLETION OF WORK AND BEFORE FINAL PAYMENT IS MADE, THIS CONTRACTOR SHALL PREPARE "AS-BUILT DRAWINGS". CLEARLY INDICATE ON A SET OF CONTRACT DRAWINGS ALL THE CHANGES MADE DURING CONSTRUCTION, DUE TO FIELD CONDITIONS, ADDENDA, BULLETINS, ETC. DRAWINGS SHALL INDICATE THE INSTALLED LOCATION OF ALL EQUIPMENT, OUTLETS, ETC.
16. WHEN THE JOB IS COMPLETE, CONTRACTOR SHALL PROVIDE THE OWNER WITH CERTIFICATE OF APPROVAL FROM THE ELECTRICAL INSPECTION AUTHORITY AND SHALL PROVIDE THE OWNER WITH A ONE YEAR WRITTEN GUARANTEE ON ALL NEW MATERIALS AND LABOR.
17. RE-SUPPORT EXISTING CONDUIT, BOXES, ETC. WHERE CEILING OR SUPPORT REVISIONS NECESSITATES NEW SUPPORTS. ALL WORK SHALL BE COORDINATED WITH OTHER DISCIPLINES.
18. ALL DEMOLISHED ITEMS SHALL BE DISPOSED OF AWAY FROM THE SITE.
19. CONTRACTOR SHALL COORDINATE SHUTOFF OF THE EXISTING DTE SERVICE AND RELOCATION OF THE SERVICE TO FEED EACH SITE (315 DETROIT ST., 415 W. WASHINGTON, 721 N. MAIN). CONTRACTOR SHALL WORK WITH DTE TO HAVE A SERVICE PLANNER ASSIGNED AND PERFORM THE SERVICE SHUTOFF AND RELOCATION. FIELD VERIFICATION AND ADJUSTMENT OF THE EXISTING SERVICE IS REQUIRED.

BASIC MATERIALS AND METHODS

1. WIRE FOR GENERAL USE SHALL BE COPPER, TYPE THHN/THWN, 90 DEGREES C. ALUMINUM WIRE SHALL NOT BE USED. ALL WIRE SHALL BE RATED AT 600 VOLTS, WET AND DRY LOCATION, MINIMUM SIZE NO. 12 A.W.G. INSTALLED IN CONDUIT, SIZED AS SHOWN ON THE DRAWINGS, MINIMUM SIZE 3/4".
2. BOXES SHALL BE GALVANIZED STEEL, CODE THICKNESS, A MINIMUM OF 1" DEEP AND OF SUFFICIENT SIZE TO ACCOMMODATE THE DEVICES THEY SERVE, ACCORDING TO N.E.C. REQUIREMENTS. PULL BOXES FOR ALL CONDUIT RUNS FOR ALL SYSTEMS SHALL BE INSTALLED AT INTERVALS NOT EXCEEDING 100 FEET OR AFTER 270 DEGREES OF BENDS.
3. CONDUITS SHALL NOT BE SUPPORTED FROM MECHANICAL DUCTS, PIPE, OR PIPE AND DUCT SUPPORTS.
4. ELECTRIC SYSTEM GROUNDING SHALL IN ALL INSTANCES COMPLY WITH THE MINIMUM REQUIREMENTS OF THE N.E.C. ALL CONDUITS SERVING WIRING OF 120 VOLTS OR GREATER SHALL INCLUDE A GROUND WIRE.
5. ELECTRICAL ENCLOSURES, CONDUIT SYSTEMS, ETC., SHALL BE THOROUGHLY GROUNDED IN ACCORDANCE WITH THE N.E.C. AND ALL LOCAL CODES.
6. PROVIDE WATERTIGHT HUBS AT CONDUIT ENTRANCES TO ALL WATERTIGHT ENCLOSURES.
7. ALL CONDUITS SHALL BE ROUTED TO AVOID OPENINGS IN FLOORS, ROOFS, AND WALLS. LADDERS UP WALLS SHALL NOT BE CROSSED BY EXPOSED CONDUIT RUNS. PROVIDE THE MINIMUM CLEAR SPACE REQUIRED BY ALL GOVERNING CODES BETWEEN HANDRAILS AND ALL ELECTRICAL ENCLOSURES AND RACEWAYS, WHICH IN NO CASE SHALL BE LESS THAN 1 1/2" CLEAR.
8. FUSED DISCONNECT SWITCHES FOR 120 VAC, 208 VAC, OR 240 VAC, SINGLE PHASE LOADS SHALL BE FUSIBLE, 30 AMPERE, 2 POLE, 2 WIRE, 240 VAC RATED SWITCHES IN A NEMA TYPE 3R ENCLOSURE, UNLESS INDICATED OTHERWISE ON THE DRAWING, SIMILAR TO EATON CUTLER-HAMMER NO. DH-221NDK, SQUARE D NO. H221AWK, OR EQUAL. DISCONNECT SWITCHES FOR 120 VAC LOADS SHALL HAVE A FUSE ELIMINATOR IN THE NEUTRAL PHASE LEG.
9. ELECTRICAL METALLIC TUBING (EMT) SHALL BE THIN WALL, GALVANIZED STEEL CONDUIT AS MANUFACTURED BY WHEATLAND TUBE, ALLIED TUBE, OR APPROVED EQUAL.
10. FUSES SHALL BE DUAL ELEMENT OR CURRENT LIMITED TYPE, CLASS R OR AS OTHERWISE REQUIRED FOR INSTALLATION IN EXISTING EQUIPMENT OR IN THE EQUIPMENT FURNISHED, AND AS SHOWN ON THE DRAWINGS. FUSES SHALL PROVIDE TYPE II PROTECTION FOR MOTOR CIRCUITS.
11. CIRCUIT BREAKERS FOR PANELBOARDS SHALL BE OF THE BOLT-IN-PLACE TYPE USING SINGLE POLE OR COMMON TRIP, TWO OR THREE POLE AS INDICATED ON THE DRAWINGS. CIRCUIT BREAKERS SHALL BE ON MOLDED CASE TYPE WITH THERMAL MAGNETIC TRIP AND BREAKER HANDLES INDICATING "ON" - "OFF" AND "TRIP" POSITIONS. GROUND FAULT CIRCUIT INTERRUPTER (GFCI) TYPE BREAKERS SHALL BE PROVIDED WHERE INDICATED ON THE DRAWINGS. BREAKERS SHALL HAVE 10,000 AMPERE INTERRUPTING CAPACITY MINIMUM AND SHALL BE APPROVED FOR "SWITCHING DUTY." ALL CIRCUIT BREAKERS SHALL BE LOCKABLE. CIRCUIT BREAKERS SHALL BE EATON-CUTLER-HAMMER, SQUARE D BY SCHNEIDER ELECTRIC, OR ABB.
12. THE DISTRIBUTION PANELBOARDS SHALL BE FACTORY ASSEMBLED FOR 240Y/120V, SINGLE PHASE SERVICE. PANELBOARDS SHALL HAVE MAIN CIRCUIT BREAKERS AS INDICATED ON THE DRAWINGS. PANELBOARD SHALL HAVE A NEMA TYPE 3R. THE PANELBOARDS SHALL BE LISTED BY UL WITH AN INTEGRATED INTERRUPTING CAPACITY OF 22,000 RMS SYMMETRICAL AMPERES AT 240 VAC, MINIMUM. PANELBOARDS SHALL BE BY EATON, SCHNEIDER ELECTRIC, OR ABB. THE PANELS SHALL BE PROVIDED WITH A DIRECTORY ON THE INSIDE OF THE DOOR.
13. CONDUIT SHALL BE ELECTRICAL METALLIC TUBING (EMT) AND SHALL BE THIN WALL, GALVANIZED STEEL CONDUIT AS MANUFACTURED BY WHEATLAND TUBE, ALLIED TUBE, OR APPROVED EQUAL.

LIGHTING PANEL LP–A

240/120V, 1PH., 3W., 200A. M.C.B. PANEL, NEUTRAL BUS & GND. BUS, SERVICE RATED, NEMA 3R RATED

CIRC. NO.	BRKR. SIZE	ITEM SERVED	LOAD (WATTS) A		LOAD (WATTS) B		ITEM SERVED	BRKR. SIZE	CIRC. NO.
1	20A	LIGHTS CANOPY B SE					LIGHTS CANOPY B/A NE	20A	2
3	20A	LIGHTS CANOPY A NE					LIGHTS CANOPY C	20A	4
5	20A	LIGHTS CANOPY D/A SW					LIGHTS CANOPY B SOUTH MID	20A	6
7	20A	LIGHTS CANOPY B SW					LIGHTS CANOPY B NORTH MID	20A	8
9	20A	LIGHTS CANOPY D/A NW					LIGHTS CANOPY A MID	20A	10
11	20A	LIGHTS CANOPY B					COL. #68	20A	12
13	20A	COL. #68					COL. #124	20A	14
15	20A	COL. #116					COL. SIGN REAR	20A	16
17	30A	SOLAR					SOLAR	30A	18
19									20
21		SPARE					SPARE		22
23		SPARE					SPARE		24
25		SPARE					SPARE		26
27		SPARE					SPARE		28
29		SPARE					SPARE		30

LIGHTING PANEL LP–B

240/120V, 1PH., 3W., 200A. M.C.B. PANEL, NEUTRAL BUS & GND. BUS, SERVICE RATED, NEMA 3R RATED

CIRC. NO.	BRKR. SIZE	ITEM SERVED	LOAD (WATTS) A		LOAD (WATTS) B		ITEM SERVED	BRKR. SIZE	CIRC. NO.
1	20A	COL. #96					COL. #67	20A	2
3	20A	COL. #101					COL. #73	20A	4
5	20A	COL. #100					COL. #63	20A	6
7	20A	COL. #97					COL. #70	20A	8
9	20A	COL. #60					COL. #72	20A	10
11	20A	COL. #8					COL. #71	20A	12
13	20A	COL. #61					COL. #65	20A	14
15	20A	COL. #62					COL. #66	20A	16
17	20A	COL. #7					COL. #69	20A	18
19	20A	COL. #5					COL. #117	20A	20
21	20A	COL. #120					COL. #114	20A	22
23	20A	COL. #123					COL. #115	20A	24
25	20A	COL. #122					COL. CALLBOX	20A	26
27	20A	COL. #125					COL. #121 (POP MACHINE)	20A	28
29	20A	COL. #7					DYNO PACK	20A	30

LIGHTING PANEL LP–C

240/120V, 1PH., 3W., 200A. M.C.B. PANEL, NEUTRAL BUS & GND. BUS, SERVICE RATED, NEMA 3R RATED

CIRC. NO.	BRKR. SIZE	ITEM SERVED	LOAD (WATTS) A		LOAD (WATTS) B		ITEM SERVED	BRKR. SIZE	CIRC. NO.
1	20A	COL. #59					PANEL D	100A	2
3	20A	COL. #58							4
5	20A	COL. #57					COL. #88	20A	6
7	20A	COL. #56					COL. #90	20A	8
9	20A	COL. #86					COL. #74	20A	10
11	20A	COL. #75					COL. #72	20A	12
13	20A	COL. #110					DOOR OPENERS	20A	14
15	20A	COL. #115							16
17	20A	COL. #10							18
19	20A	COL. #9					COL. #94	20A	20
21							COL. #90	20A	22
23							COL. #89	20A	24
25	20A	COL. #92							26
27	20A	COL. #118					COL. #76	20A	28
29		SPARE					COL. #79	20A	30

CITY OF ANN ARBOR MICHIGAN — FOUNDED 1824 — INCORPORATED 1851

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WEB SITE: www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
06/10/24	ISSUED FOR BID
06/03/24	OWNER REVIEW

DESIGNED	MJR
DRAWN	DJK
CHECKED	MJR
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

315 DETROIT ST.
ONE-LINE DIAGRAM

HRC JOB NO. 20240292	SCALE NO SCALE
DATE June 2024	SHEET NO. E–3 OF

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Kitayama, Denali J.
ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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Melchior, Adrianna M.
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ELECTRICAL SITE PLAN - PROPOSED WORK

SCALE: 3/32" = 1'-0"

0 2 4 8 16 24

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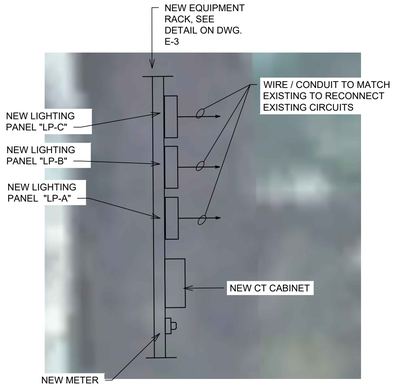


WORK AREA "B"

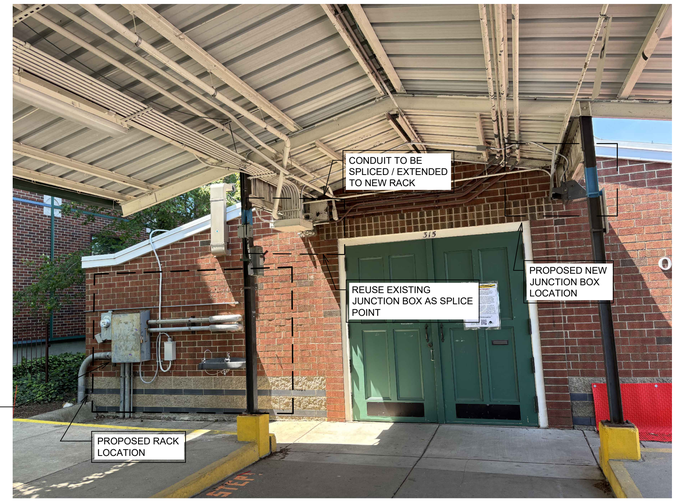
SCALE: 1/2" = 1'-0"

0 1 2 4

N

NOTE: PROVIDE SIMILAR SEPARATE RACK FOR REMOUNTING SOLAR PANEL CONTROLS - VERIFY EXACT LOCATION ON SITE WITH OWNER

SERVICE EQUIPMENT TO BE REMOVED, NEW EQUIPMENT MOUNTED ON EQUIPMENT RACK IN FRONT OF BUILDING



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CITY OF ANN ARBOR MICHIGAN — FOUNDED 1824 — INCORPORATED 1851

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WEB SITE: www.hrcengr.com

WORK AREA "B"

06/10/24 MJR	ISSUED FOR BID
06/03/24 DJK	OWNER REVIEW
DATE MJR	ADDITIONS AND/OR REVISIONS

DESIGNED JFB	MJR
DRAWN	DJK
CHECKED	MJR
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

ELECTRICAL PROPOSED PLAN

315 DETROIT ST.
ELECTRICAL PROPOSED PLAN

AS NOTED

HRC JOB NO. 20240292	E-2 AS NOTED
DATE June 2024	SHEET NO. E-4 OF

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)

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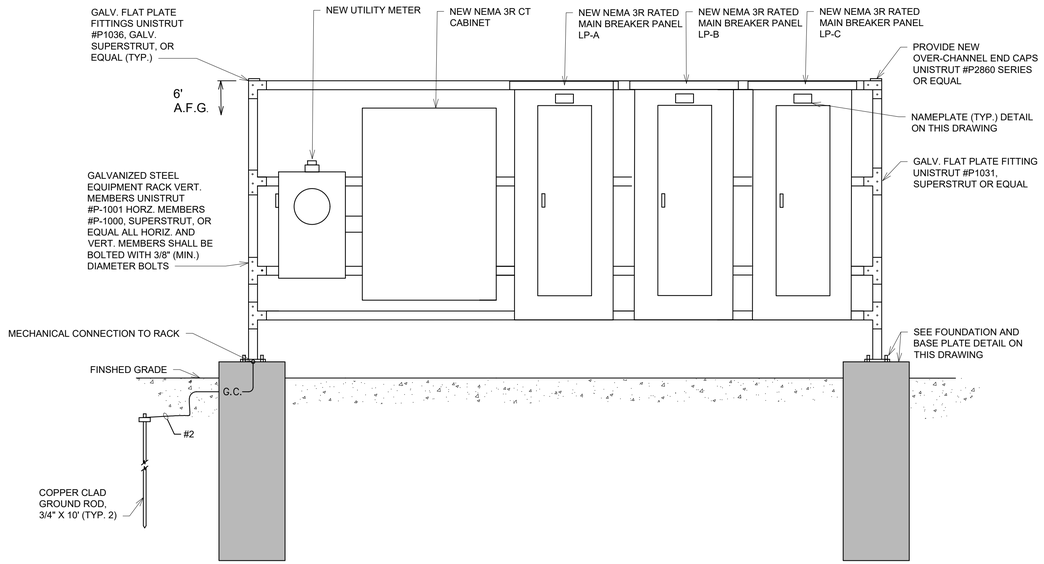
Melchior, Adrionna M.

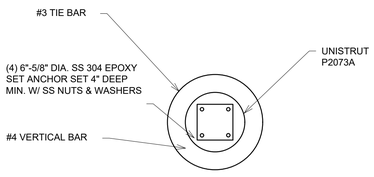


✳ EXACT WIDTH OF SUPPORT RACK SHALL BE DETERMINED BY THE EQUIPMENT SUPPLIED.

EQUIPMENT SUPPORT RACK ON CONCRETE SLAB DETAIL

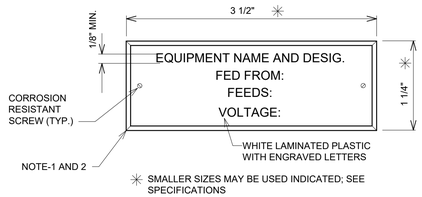
N.T.S.
(CONDUIT NOT SHOWN FOR CLARITY)

IMPORTANT: ELECTRICAL CONTRACTOR IS TO COORDINATE WITH DTE REGARDING RELOCATION OF ALL DTE EQUIPMENT (METERS, TRANSFORMERS, ETC.) AND ELECTRIC SHUTOFFS. ELECTRICAL CONTRACTOR MUST HAVE FAMILIARITY WITH THIS TYPE OF WORK WITHIN DTE SERVICE TERRITORY. AFTER CONTRACT IS AWARDED, ELECTRICAL CONTRACTOR IS TO CONTACT DTE TO HAVE A PLANNER CREATE THE WORK REQUEST FOR EACH SITE SEPARATELY.



EQUIPMENT RACK BASE PLATE DETAIL

N.T.S.



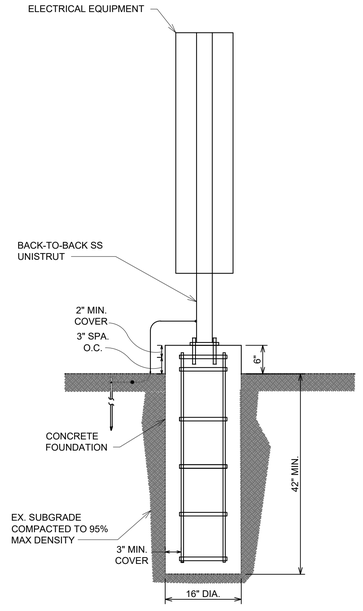
✳ SMALLER SIZES MAY BE USED INDICATED; SEE SPECIFICATIONS

NAMEPLATE DETAIL

FULL SCALE

NOTES:

1. NAMEPLATES SHALL BE PROVIDED FOR ALL NEW BRANCH CIRCUITS IN NEW DISTRIBUTION PANELS, AND RECEPTACLE PANELS.
2. NAMEPLATES SHALL BE PROVIDED FOR NEW BRANCH CIRCUITS AND/OR MODIFICATIONS TO EXISTING SWITCHGEARS, DISTRIBUTION PANELS, AND RECEPTACLE PANELS.



TYPICAL EQUIPMENT RACK & FOUNDATION DETAIL

N.T.S.

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915
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WEB SITE: www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
06/10/24	ISSUED FOR BID
06/03/24	OWNER REVIEW

DESIGNED	MJR
DRAWN	DJK
CHECKED	MJR
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

ELECTRICAL DETAILS

HRC JOB NO.	SCALE
20240292	AS NOTED
DATE: June 2024	SHEET NO. E-5 OF

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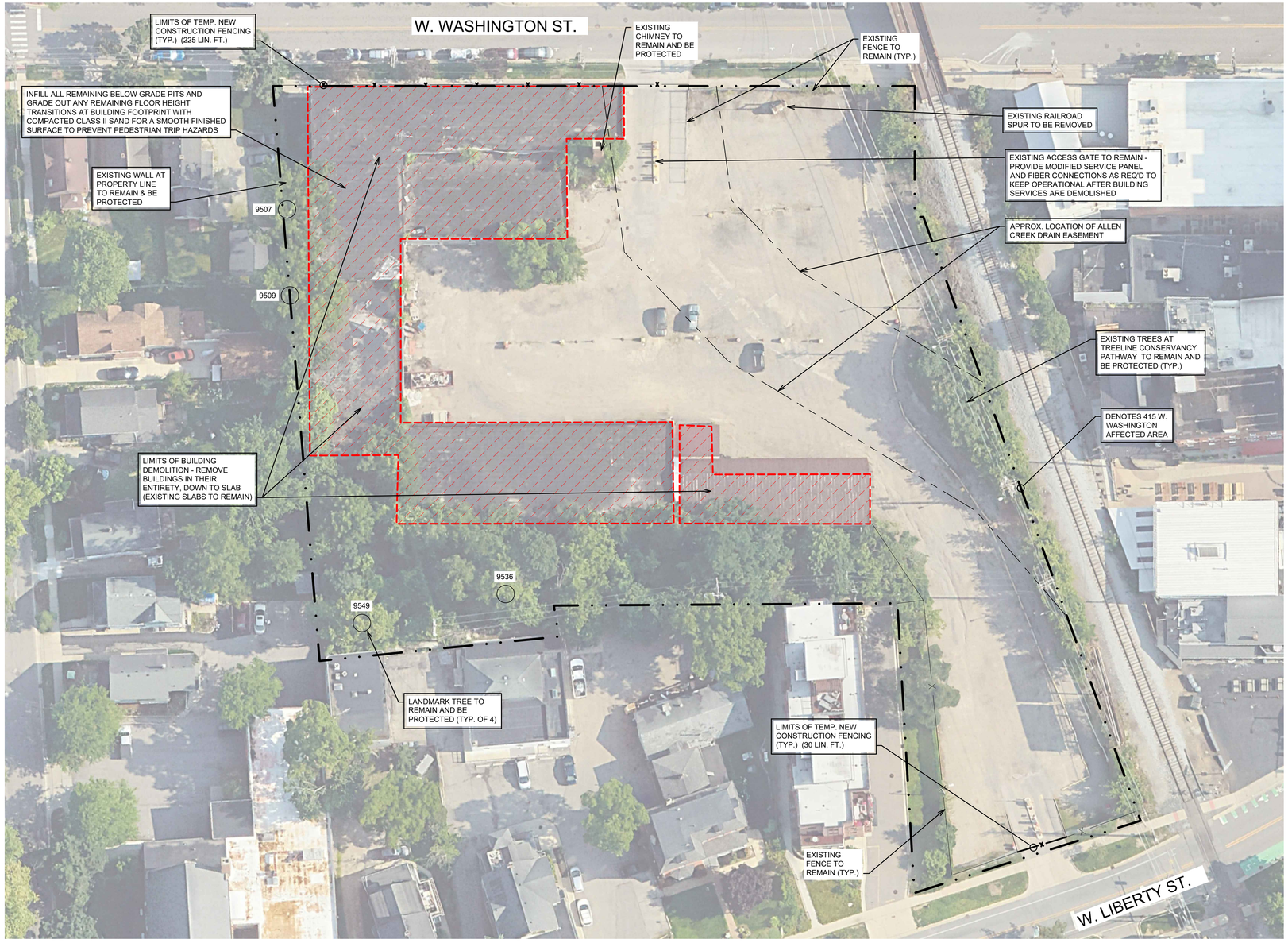
GENERAL NOTES:

1. DEMOLITION CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UTILITY STUBS TO THE BUILDING AND COORDINATE TERMINATIONS OF LINES AT EDGE OF PROJECT AREA WITH CITY OF ANN ARBOR DPW.
2. DEMOLITION CONTRACTOR SHALL SUBMIT TO ENGINEER A PLAN SHOWING A 6'-0" CHAIN LINK PERIMETER FENCE AT DEMOLITION LIMITS AND A SILT FENCE FOR SOIL EROSION AND SEDIMENTATION CONTROL.
3. ALL REMAINING EXISTING BUILDINGS AND SITE COMPONENTS IN THE VICINITY ARE TO BE PROTECTED FROM DAMAGE.
4. ALL UTILITY INFORMATION IS BASED ON REFERENCE DRAWINGS AND MUST BE FIELD VERIFIED PRIOR TO THE START OF DEMOLITION ACTIVITIES.
5. CONTRACTOR IS TO PROVIDE TEMPORARY POWER AS REQUIRED.
6. REFER TO HAZARDOUS MATERIAL REPORT FOR REMEDIATION REQUIREMENTS AT BUILDING.
7. ALL WORKERS MUST HAVE MIOSHA LEAD IN CONSTRUCTION TRAINING PRIOR TO STARTING WORK.
8. PROVIDE PEDESTRIAN PROTECTION DURING DEMOLITION ACTIVITIES PER MICHIGAN BUILDING CODE SECTIONS 3303 AND 3306.
9. DEMOLITION AND ELECTRICAL PERMITS ARE REQUIRED TO BE OBTAINED WITH THE CITY OF ANN ARBOR AS PART OF THIS WORK SCOPE.

PROJECT NOTES:

1. DEMOLITION WORK AT THIS SITE MUST START NO LATER THAN SEPTEMBER 10, 2024 - COORDINATE SCHEDULE WITH OWNER PRIOR TO START OF DEMOLITION.
2. WORKING HOURS ARE REQUIRED TO BE STRICTLY OBSERVED SO AS NOT TO DISTURB ANY CHIMNEY SWIFT BIRDS ROOSTING AT EXISTING REMAINING CHIMNEY. DEMOLITION AND/OR CONSTRUCTION ACTIVITIES AROUND THE CHIMNEY ARE **NOT** PERMITTED BEFORE THE CHIMNEY SWIFTS HAVE DEPARTED FROM THE SITE AT FIRST LIGHT, OR AFTER THEY RETURN AT 30 MINUTES BEFORE DUSK, OR ANYTIME THERE IS A STORM. THE CHIMNEY SWIFTS BEGIN MIGRATION MID-SEPTEMBER, AND SHOULD BE COMPLETELY GONE FROM THE SITE BY THE 3RD WEEK OF OCTOBER.
3. THE BUILDINGS ARE TO BE REMOVED IN THEIR ENTIRETY, DOWN TO THE EXISTING MAIN LEVEL FLOOR SURFACES. EXISTING SLABS, FOUNDATIONS, AND BELOW-GRADE STRUCTURES TO REMAIN.
2. SANITARY LEADS AT BUILDING HAVE NOT YET BEEN DISCONNECTED BY DPW - ALL PIPING PENETRATING THROUGH SLABS ARE TO BE CAPPED FLUSH AT GRADE.
3. WATER LEADS AT BUILDING HAVE BEEN DISCONNECTED BY DPW - ALL PIPING PENETRATING THROUGH SLABS ARE TO BE CAPPED FLUSH AT GRADE. CONTRACTOR WILL BE REQUIRED TO SUPPLY THEIR OWN WATER FOR DEMOLITION PROCEEDINGS.
4. ANY STORM DRAIN LINES CONNECTED TO BUILDING ARE TO BE REMOVED ABOVE GRADE AND CAPPED FLUSH AT SLAB PENETRATIONS.
5. ANY REMAINING BELOW GRADE UTILITY STRUCTURES TO BE CRACKED AND FILLED WITH PEA GRAVEL TO PREVENT PONDING.
6. ELECTRICAL AND FIBER INFRASTRUCTURE AT BUILDING TO BE REWORKED AS NOTED TO MAINTAIN ELECTRICAL SERVICE TO ENTRANCE GATE. ALL REMAINING CONDUITS FOR DISCONNECTED SERVICES TO BE CAPPED FLUSH AT GRADE.
7. NATURAL GAS LEADS AT BUILDINGS TO BE CUT AND CAPPED FLUSH AT GRADE. COORDINATE EXACT REQUIREMENTS WITH DPW.
8. NO PERMANENT WORK IS TO OCCUR WITHIN THE ALLEN CREEK DRAIN FLOODWAY.
9. THE SITE HAS CONTAMINATED SOIL AND GROUNDWATER. CONTAMINATED SAMPLE MATERIAL CURRENTLY STORED IN THE BUILDING IS TO BE DISPOSED OF IN ACCORDANCE WITH ALL STATE AND FEDERAL REQUIREMENTS. MONITORING WELLS ARE TO REMAIN AND BE CAPPED FLUSH AT GRADE.
10. ONCE BUILDING HAS BEEN REMOVED, CONTRACTOR SHALL PROVIDE COMPACTED CLASS II SAND BACKFILL AT SURFACES OF SLABS TO SMOOTH OUT ELEVATION CHANGES AT ALL REMAINING CURBS, PIT ENCLOSURES, SLAB EDGES, AND RAISED EQUIPMENT PADS. MAXIMUM SLOPE OF TRANSITIONS SHALL BE 1:2.



BUILDING DEMOLITION PLAN

SCALE: 1" = 30'-0"

N

LEGEND

LIMITS OF BUILDING DEMOLITION

X
A-X
DENOTES PHOTO NUMBER & SHEET LOCATION

CITY OF ANN ARBOR
FOUNDED 1824
INCORPORATED 1851
MICHIGAN

HRC
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DATE	ADDITIONS AND/OR REVISIONS
06/10/24	ISSUED FOR BID
06/03/24	OWNER REVIEW

DESIGNED	AMM
DRAWN	AG
CHECKED	AMM
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

415 W. WASHINGTON
DEMOLITION PLAN

HRC JOB NO. 20240292	SCALE AS NOTED
DATE June 2024	SHEET NO. D-5 OF

Melchior, Adrianna M.
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ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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PHOTO NO. 01

REMOVE BUILDINGS IN THEIR ENTIRETY, DOWN TO SLAB (EXISTING SLABS TO REMAIN)

EXISTING CHIMNEY TO REMAIN AND BE PROTECTED

EXISTING GATE TO REMAIN AND BE PROTECTED (TYP.)

PHOTO NO. 02

EXISTING DEBRIS ADJACENT TO BUILDING TO BE REMOVED AS PART OF FINAL CLEANUP

EXISTING ANTENNA TOWER TO BE REMOVED

PHOTO NO. 03

EXISTING TREES TO BE REMOVED AS REQ'D TO ACCOMMODATE DEMOLITION ACTIVITIES (TYP.)

REMOVE BUILDINGS IN THEIR ENTIRETY, DOWN TO SLAB (EXISTING SLABS TO REMAIN)

PHOTO NO. 04

PHOTO NO. 05

REMAINING PORTION OF EXISTING SITE OUTSIDE OF BUILDINGS TO REMAIN - REGRADE ADJACENT TO BUILDING FLOOR SLABS FOR SMOOTH TRANSITION (TYP.)

EXISTING SECTION OF FENCE TO REMAIN AND BE PROTECTED

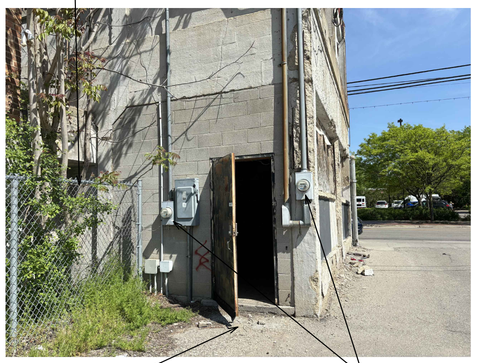

PHOTO NO. 06

REFER TO ELECTRICAL DRAWINGS FOR RELOCATION OF METER AND ELECTRICAL SERVICE

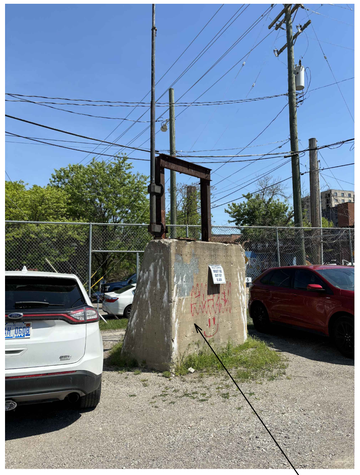

PHOTO NO. 07

EXISTING RAILROAD SPUR TO BE REMOVED DOWN TO GRADE

EXISTING SHED AND EQUIPMENT INSIDE, AS WELL AS FENCING SURROUND TO BE REMOVED DOWN TO GRADE

PHOTO NO. 08

EXISTING ABOVE GRADE EXPOSED POWER AND FIBER LINES TO BE REMOVED BACK TO SOURCE (TYP. U.N.O.)

EXISTING BUILDING TO BE REMOVED DOWN TO GRADE (TYP.)

PHOTO NO. 09

EXISTING SIDEWALK ON W. WASHINGTON STREET TO REMAIN AND BE PROTECTED - REPLACE ANY DAMAGED SECTIONS WITH NEW TO MATCH EXISTING AS PART OF FINAL SITE CLEANUP (TYP.)

SAWCUT EXISTING SLAB & FOUNDATIONS DOWN ALONG W. WASHINGTON AS REQ'D FOR SMOOTH TRANSITION BETWEEN EXISTING SIDEWALK AND REMAINING BUILDING AT GRADE TO PREVENT TRIP HAZARDS (TYP.)

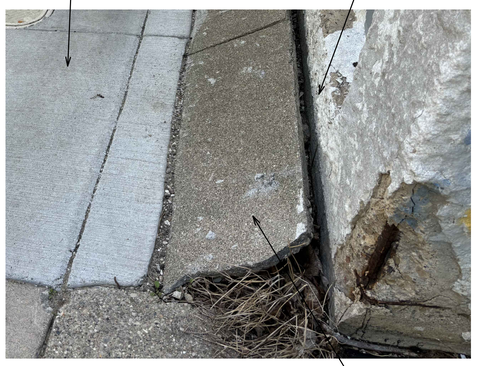

PHOTO NO. 10

SLAB TRANSITION FILLER TO BE REMOVED (TYP.)

EXISTING ABOVE GRADE EXPOSED POWER AND FIBER LINES TO BE REMOVED BACK TO SOURCE (TYP. U.N.O.)

PHOTO NO. 11

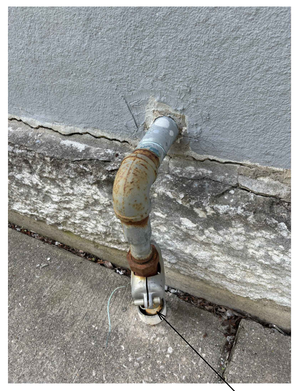

PHOTO NO. 12

EXISTING PIPING PENETRATIONS TO BE REMOVED AND CAPPED FLUSH AT GRADE - SAWCUT AND REPLACE CONCRETE SIDEWALK WITH NEW TO MATCH EXISTING AS REQ'D

CITY OF ANN ARBOR
FOUNDED 1824 INCORPORATED 1851 MICHIGAN

HRC
HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915
555 HULET DRIVE
BLOOMFIELD HILLS, MICH.
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WEB SITE: www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
06/10/24	ISSUED FOR BID
06/03/24	OWNER REVIEW

DESIGNED	AMM
DRAWN	AG
CHECKED	AMM
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

415 W WASHINGTON
REFERENCE PHOTOS

HRC JOB NO. 20240292	SCALE AS NOTED
DATE June 2024	SHEET NO. D-6 OF

V:\2024\02\20240292\A\Sheets\D6_415-Photos_Plot.dwg
Melchior, Adrionna M.
ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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PHOTO NO. 13

EXISTING ELECTRICAL INFRASTRUCTURE TO BE REMOVED - CUT AND CAP ALL UTILITY PENETRATIONS FLUSH AT GRADE. (TYP.)

PHOTO NO. 14

PHOTO NO. 15

INFILL ALL REMAINING BELOW GRADE PITS AND GRADE OUT ANY REMAINING FLOOR HEIGHT TRANSITIONS AT BUILDING FOOTPRINT WITH COMPACTED CLASS II SAND FOR A SMOOTH FINISHED SURFACE TO PREVENT PEDESTRIAN TRIP HAZARDS

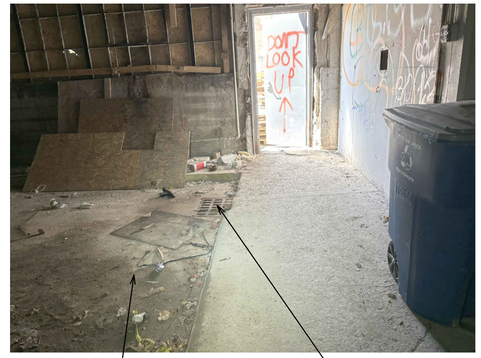

PHOTO NO. 16

REMAINING BELOW GRADE UTILITY STRUCTURES TO BE CRACKED AND FILLED WITH PEA GRAVEL AND CAPPED FLUSH WITH GRADE TO PREVENT PONDING (TYP.)

PHOTO NO. 17

ALL BUILDING COMPONENTS AND CONTENTS TO BE REMOVED DOWN TO FIRST FLOOR SLAB (TYP.)

PHOTO NO. 18

CONTAMINATED SAMPLE MATERIALS, SALT, AND INDUSTRIAL PRODUCTS ARE TO BE HANDLED AND DISPOSED OF IN ACCORDANCE WITH ALL CITY, STATE AND FEDERAL REQUIREMENTS (TYP.)

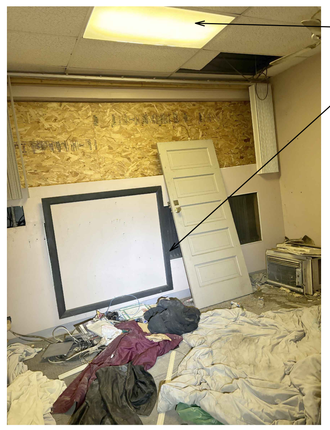

PHOTO NO. 19

ALL BUILDING CONTENTS TO BE REMOVED AS PART OF BUILDING DEMOLITION (TYP.)

PHOTO NO. 20

ALL BUILDING CONTENTS TO BE REMOVED DOWN TO FIRST FLOOR SLAB AS PART OF BUILDING DEMOLITION (TYP.)

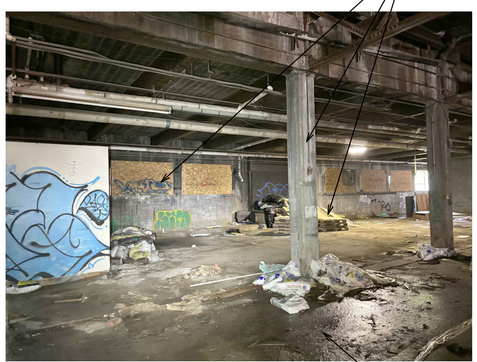

PHOTO NO. 21

EXISTING GRADE LEVEL SLABS TO REMAIN (TYP.)

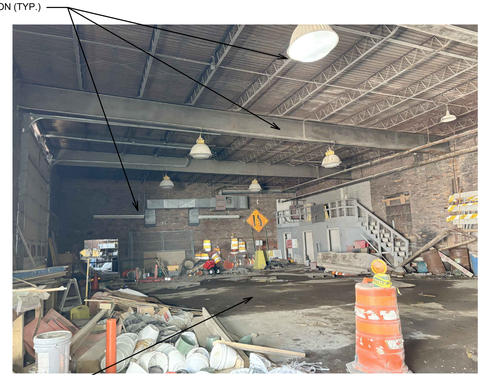

PHOTO NO. 22

ALL FLOOR PENETRATIONS TO BE CAPPED FLUSH AT GRADE (TYP.)

PHOTO NO. 23

EXISTING BELOW GRADE PITS TO REMAIN AND BE BACKFILLED TO GRADE - REMOVE EQUIPMENT, PIPING, AND LOOSE DEBRIS PRIOR TO BACKFILLING (TYP.)

INFILL ALL REMAINING BELOW GRADE PITS AND GRADE OUT ANY REMAINING FLOOR HEIGHT TRANSITIONS AT BUILDING FOOTPRINT WITH COMPACTED CLASS II SAND FOR A SMOOTH FINISHED SURFACE TO PREVENT PEDESTRIAN TRIP HAZARDS

PHOTO NO. 24

CITY OF ANN ARBOR
FOUNDED 1824 INCORPORATED 1851 MICHIGAN

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DESIGNED	AMM
DRAWN	AG
CHECKED	AMM
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

415 W WASHINGTON
REFERENCE PHOTOS

HRC JOB NO. 20240292	SCALE AS NOTED
DATE June 2024	SHEET NO. D-7 OF

Melchior, Adrianna M.
V:\2024\02\20240292\A\Sheets\D7_415-Photos_Plot.dwg
ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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PHOTO NO. 25

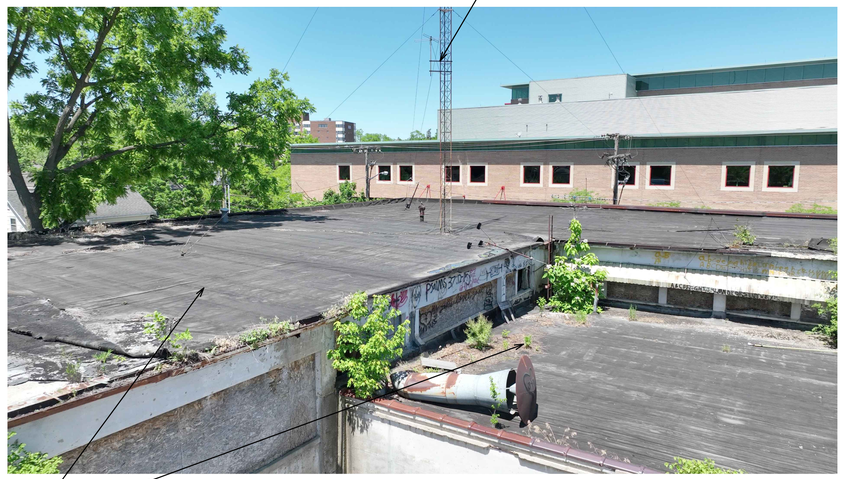

PHOTO NO. 26

PHOTO NO. 27

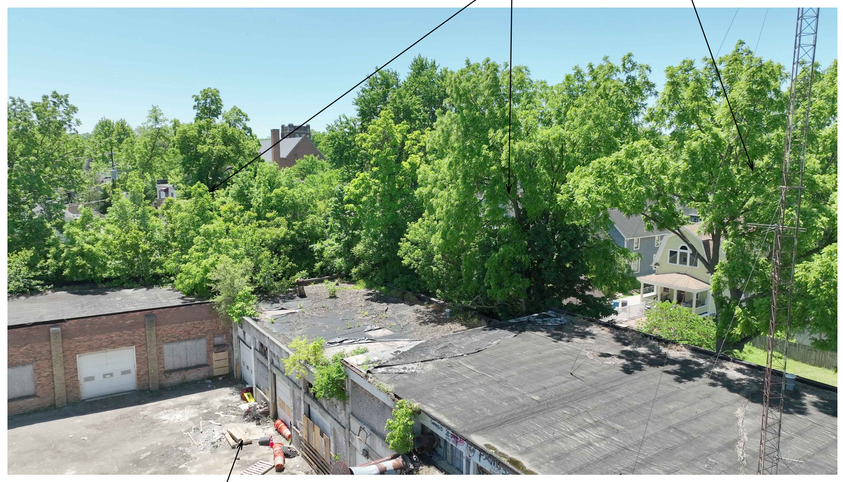

PHOTO NO. 28

CITY OF ANN ARBOR
FOUNDED 1824 INCORPORATED 1851
MICHIGAN

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CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

415 W WASHINGTON
REFERENCE PHOTOS

HRC JOB NO.	SCALE
20240292	AS NOTED
DATE: June 2024	SHEET NO. D-8 OF

Melchior, Adrianna M.
V:\202402\20240292\A\Sheets\D8_415-Photos_Plot.dwg
ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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Melchior, Adrianna M.

EXISTING CHIMNEY TO REMAIN AND BE PROTECTED

EXISTING BUILDING TO BE REMOVED IN ITS ENTIRETY

PHOTO NO. 01

SALVAGE 250 BRICK MASONRY UNITS FOR REUSE IN CHIMNEY

PHOTO NO. 02

RAKE- OUT LOOSE MORTAR AND REPOINT THE BED AND HEAD JOINTS IN THE TOP 4' OF COURSES ON THE EXTERIOR AND INSIDE THE SHAFT

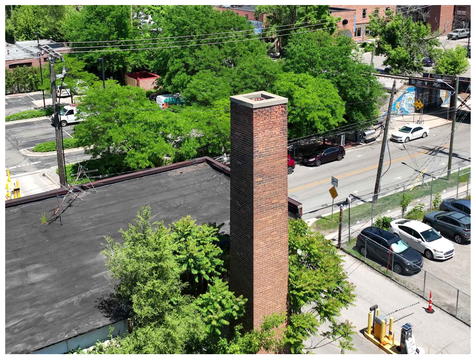

PHOTO NO. 03

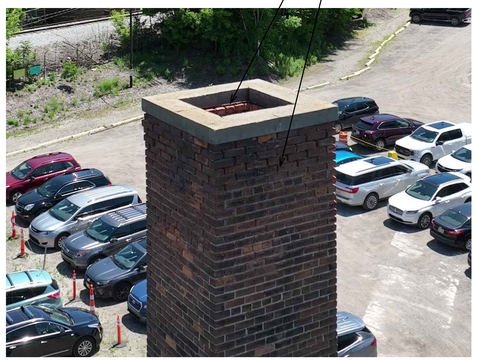

PHOTO NO. 04

REMOVE EXISTING BRICK ON EACH SIDE AS NECESSARY TO TOOTH IN SALVAGED BRICK FROM GARAGE DEMOLITION AND FILL IN OPENING, ASSUME 3 WYTHES

EXISTING CONCRETE FLUE TO BE SHORED AND CAREFULLY REMOVED

FINISH ROW LOCK COURSE ACROSS OPENING

PHOTO NO. 05

EXISTING NON- LOAD BEARING CMU WALL TO BE REMOVED

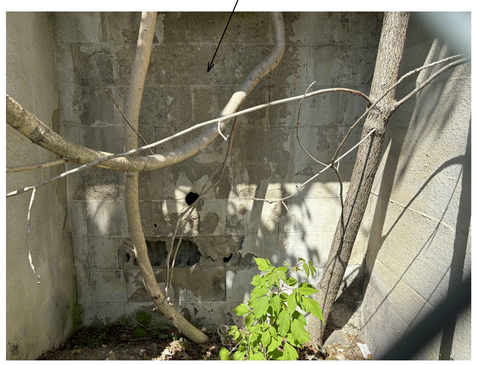

PHOTO NO. 06

MASONRY:

1. ALL CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C 90 AND C 140.

2. MORTAR SHALL CONFORM TO ASTM C 270, AS FOLLOWS:
   IN CONTACT WITH EARTH - TYPE M
   NOT IN CONTACT WITH EARTH - TYPE M OR S

3. GROUT SHALL CONFORM TO ASTM C 476, WITH PEA GRAVEL AGGREGATE AND WITH MINIMUM STRENGTH IN ACCORDANCE WITH THE TABLE BELOW.

4. BASED ON THE FOLLOWING MINIMUM STRENGTHS SPECIFIED ABOVE FOR BLOCK, MORTAR AND GROUT, THE MINIMUM COMPOSITE MASONRY COMPRESSIVE STRENGTH, f'm, SHALL BE AS FOLLOWS:

USE	COMPRESSIVE STRENGTH, f'm (PSI)	UNIT STRENGTH (PSI)	GROUT STRENGTH (PSI)	MORTAR TYPE
TYPICAL U.N.O.	1500 MIN.	1900 MIN.	2000 MIN.	M OR S

5. REPLACEMENT FACE BRICK SHALL BE ASTM C216, TYPE FBX, GRADE SW, COLOR SHALL BE AS SELECTED BY THE OWNER TO MATCH EXISTING. PROVIDE NEW GALV. TIES AS REQUIRED.

MASONRY REPOINTING SPECIFICATIONS

1. DETERIORATED MORTAR JOINTS IN EXISTING BUILDING MASONRY, AND OTHER AREAS THAT MAY BE SHOWN ON THE DRAWINGS, SHALL BE CLEANED OUT AND REFILLED WITH FRESH MORTAR.
2. ALL NEW MORTAR INSTALLED AS PART OF THIS WORK SHALL MATCH THE COLOR OF THE ADJACENT MORTAR FOR THE AREA BEING WORKED ON.
3. JOINTS SHALL BE CONSIDERED DETERIORATED IF THEY ARE ERODED BACK 1/4 INCH OR MORE FROM THE FACE OF THE MASONRY UNITS; MORTAR HAS FALLEN OUT OF THE JOINT; HAIRLINE CRACKS RUN THROUGH THE MORTAR; OR THE BOND BETWEEN MORTAR AND MASONRY UNIT IS BROKEN.

4. RAKING THE OLD MORTAR JOINTS:
   - 4.1. MORTAR JOINTS SHOULD BE RAKED OUT TO AT LEAST 1/2 INCH DEPTH OR, IF THE JOINT IS MORE THAN 1/2 INCH THICK, TO A DEPTH AS GREAT AS THE THICKNESS OF THE MORTAR JOINT.
   - 4.2. IF THE MORTAR IS STILL UNSOUND AT 1/2 INCH, THE JOINT SHALL BE CUT DEEPER.
   - 4.3. ALL UNSOUND MORTAR SHALL BE REMOVED WITHOUT DISTURBING THE BRICK.

5. MORTAR MAY BE REMOVED WITH A HAND-HELD GRINDER, A SMALL MASON'S CHISEL, OR A SPECIAL RAKING TOOL.
   - 5.1. IF THE GRINDER IS USED TO RAKE VERTICAL JOINTS, CARE SHALL BE TAKEN NOT TO CUT THE BRICK IN THE NEXT COURSE ABOVE OR BELOW THE JOINT.
   - 5.2. BEFORE TUCKPOINTING, BRUSH ALL LOOSE FRAGMENTS AND DUST FROM THE JOINT OR FLUSH THEM OUT WITH A STREAM OF WATER.

6. TUCKPOINTING MORTAR SHOULD CLOSELY MATCH THE EXISTING MORTAR IN STRENGTH, HARDNESS, COLOR, AND TEXTURE.

7. TEST THE EXISTING MORTAR TO SEE WHAT MIX PROPORTIONS WERE USED. TYPE N MORTAR MAY BE USED IF THE ORIGINAL MORTAR CAN'T BE DUPLICATED. TYPE N MORTAR SHOULD BE MADE FROM 1 PART PORTLAND CEMENT, 1 PART TYPE S HYDRATED LIME, AND 4 ½ TO 6 PARTS SAND. ORDINARY GRAY OR WHITE MORTARS CAN BE RETEMPERED AS NEEDED WITHIN THE FIRST 2 ½ HOURS AFTER THEY'RE MIXED.
   - 7.1. THE MORTAR INGREDIENTS SHALL BE HIGH QUALITY.
     - a. PORTLAND CEMENT (GRAY OR WHITE) SHALL MEET THE REQUIREMENTS OF ASTM C 150, TYPE I OR IA.
     - b. HYDRATED MASON'S LIME SHOULD MEET THE REQUIREMENTS OF ASTM C 207, TYPE S. HYDRAULIC QUICKLIME.
     - c. SAND SHOULD MEET ASTM C 5 AND C 144 REQUIREMENTS, RESPECTIVELY.
     - d. DO NOT USE ADMIXTURES.
   - 7.2 TO COMPENSATE FOR SHRINKAGE, A PREHYDRATION PROCESS SHALL BE USED.
     - a. MIX THE DRY INGREDIENTS WITH ONLY ENOUGH WATER TO PRODUCE A DAMP, UNWORKABLE MIX THAT RETAINS ITS FORM WHEN PRESSED INTO A BALL.
     - b. KEEP THE MORTAR IN THIS DAMP CONDITION FOR 1 TO 2 HOURS AND THEN ADD THE REMAINING WATER REQUIRED.
     - c. MORTAR FOR TUCKPOINTING SHOULD BE SOMEWHAT DRIER THAN MORTAR USED TO LAY MASONRY UNITS.
     - d. THIS DRIER MIX IS EASIER TO PLACE:
     - e. IT DOESN'T FLOW TO THE BOTTOM OF THE JOINT AFTER IT'S BEEN PUSHED INTO THE JOINT WITH THE TUCKPOINTER'S TROWEL.

CHIMNEY SCOPE ITEMS

DESCRIPTION	UNIT	AMOUNT
BRICK REPOINTING	LF	450
BROKEN/ DAMAGED BRICK REPLACEMENT	EA	150

EXISTING BUILDING MASONRY NOTES:

- EXISTING MORTAR AT MASONRY JOINTS TO BE REPOINTED AT CRACKED AND/OR DAMAGED LOCATIONS. EXACT QUANTITY TO BE DETERMINED IN FIELD, AT OWNER WALK THROUGH DURING CONSTRUCTION. FOR PRICING PURPOSES IN BID PROPOSAL, CONTRACTOR TO INCLUDE REPOINTING QUANTITIES NOTED ON THIS SHEET, AND UNIT PRICING PER LINEAL FOOT.
- EXISTING CRACKED AND/OR DAMAGED BRICK UNITS TO BE REMOVED AND REPLACED WITH NEW TO MATCH EXISTING SIZE, COLOR, MODULE AND TEXTURE. EXACT QUANTITY TO BE DETERMINED IN FIELD, AT OWNER WALK THROUGH DURING CONSTRUCTION. FOR PRICING PURPOSES IN BID PROPOSAL, CONTRACTOR TO INCLUDE SALVAGING REPLACEMENT BRICK QUANTITIES NOTED ON THIS SHEET, AND UNIT PRICING PER BRICK.

PROJECT NOTES:

1. WORKING HOURS ARE REQUIRED TO BE STRICTLY OBSERVED SO AS NOT TO DISTURB ANY CHIMNEY SWIFT BIRDS ROOSTING AT EXISTING REMAINING CHIMNEY. DEMOLITION AND/OR CONSTRUCTION ACTIVITIES AROUND THE CHIMNEY ARE **NOT** PERMITTED BEFORE THE CHIMNEY SWIFTS HAVE DEPARTED FROM THE SITE AT FIRST LIGHT, OR AFTER THEY RETURN AT 30 MINUTES BEFORE DUSK, OR ANYTIME THERE IS A STORM. THE CHIMNEY SWIFTS BEGIN MIGRATION MID-SEPTEMBER, AND SHOULD BE COMPLETELY GONE FROM THE SITE BY THE 3RD WEEK OF OCTOBER.

CITY OF ANN ARBOR MICHIGAN FOUNDED 1824 INCORPORATED 1851

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06/03/24	OWNER REVIEW

DESIGNED	JY
DRAWN	AG
CHECKED	AMM
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

415 W. WASHINGTON
CHIMNEY REFERENCE INFORMATION

HRC JOB NO. 20240292	SCALE AS NOTED
DATE June 2024	SHEET NO. S-1 OF

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)

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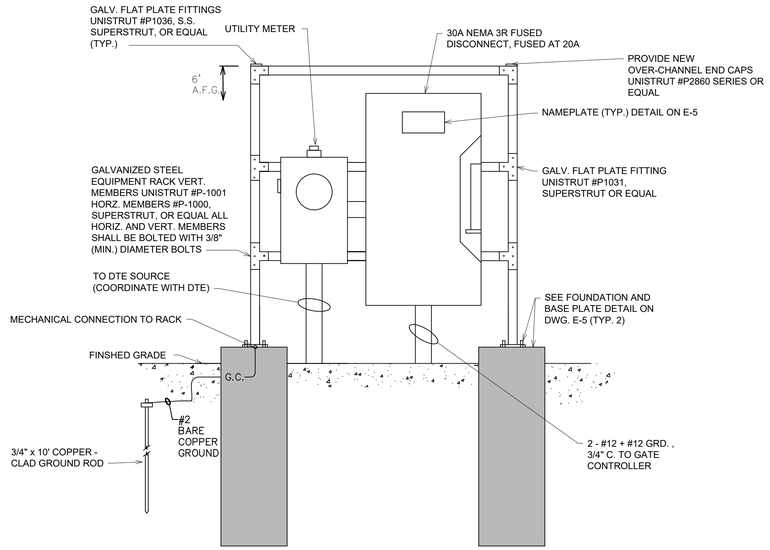
Melchior, Adrianna M.

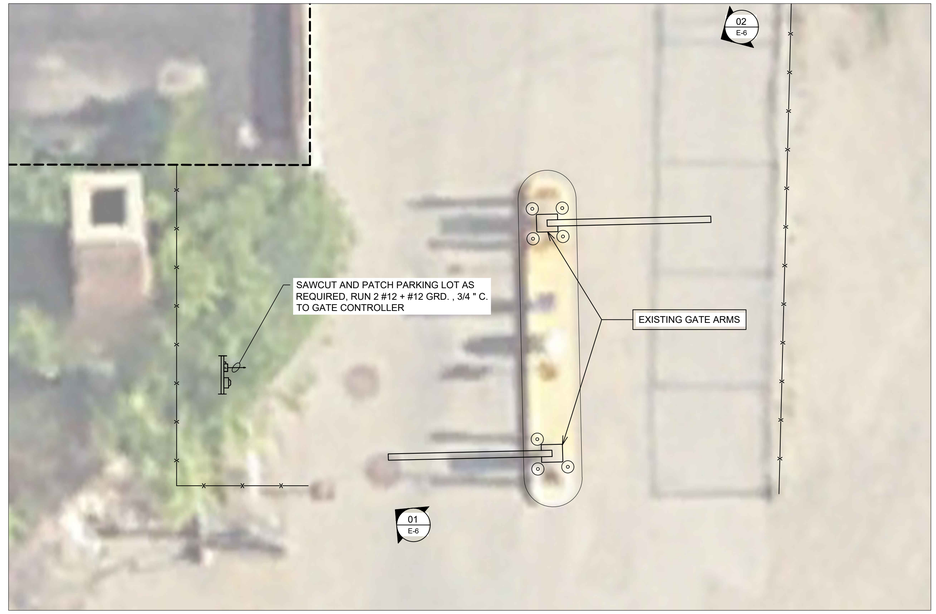
IMPORTANT: ELECTRICAL CONTRACTOR IS TO COORDINATE WITH DTE REGARDING RELOCATION OF ALL DTE EQUIPMENT (METERS, TRANSFORMERS, ETC.) AND ELECTRIC SHUTOFFS. ELECTRICAL CONTRACTOR MUST HAVE FAMILIARITY WITH THIS TYPE OF WORK WITHIN DTE SERVICE TERRITORY. AFTER CONTRACT IS AWARDED, ELECTRICAL CONTRACTOR IS TO CONTACT DTE TO HAVE A PLANNER CREATE THE WORK REQUEST FOR EACH SITE SEPARATELY.



* EXACT WIDTH OF SUPPORT RACK SHALL BE DETERMINED BY THE EQUIPMENT SUPPLIED.

EQUIPMENT SUPPORT RACK ON CONCRETE SLAB DETAIL

N.T.S.



ELECTRICAL SITE PLAN - PROPOSED WORK

N

SCALE: 1" = 5'

0 2.5 5 10

PHOTO NO. 01

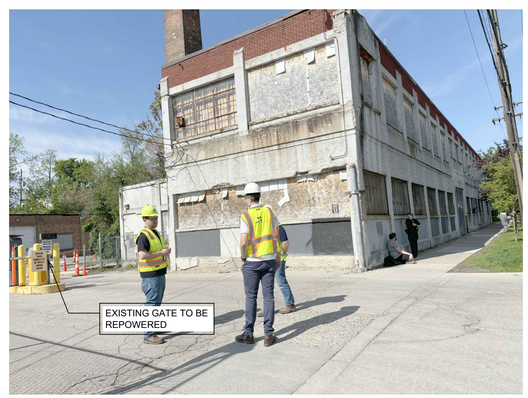


PHOTO NO. 02

CITY OF ANN ARBOR MICHIGAN
FOUNDED 1824 INCORPORATED 1851

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06/10/24	ISSUED FOR BID
06/03/24	OWNER REVIEW

DESIGNED	MJR
DRAWN	DJK
CHECKED	MJR
APPROVED	JFB

415 W. WASHINGTON
ELECTRICAL PROPOSED PLAN

HRC JOB NO. 20240292	SCALE AS NOTED
DATE June 2024	SHEET NO. E-6 OF

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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Water Utilities Tap Card Database

Street Name	N MAIN ST	Tap Number	8508	Fence Line	9
Street Number	721	Size	2	Main to Curb Box	28 Feet
Lot Number		Material	Copper	Cover	5
Property ID		Disconnected	☐	Main Size	6
				ROW in Feet	0
Date	9/5/1929	Initial	ALT		
Remarks	Tapped on W. Summit St #123 70' E of WPL, 98' W of EPL	Verified	☐		
		QAQC Initial			
Sketch	☐				

Tap Location Description

Rec Numt	Description
10159316	E to WPL fo N Main
10159906	W to RR track

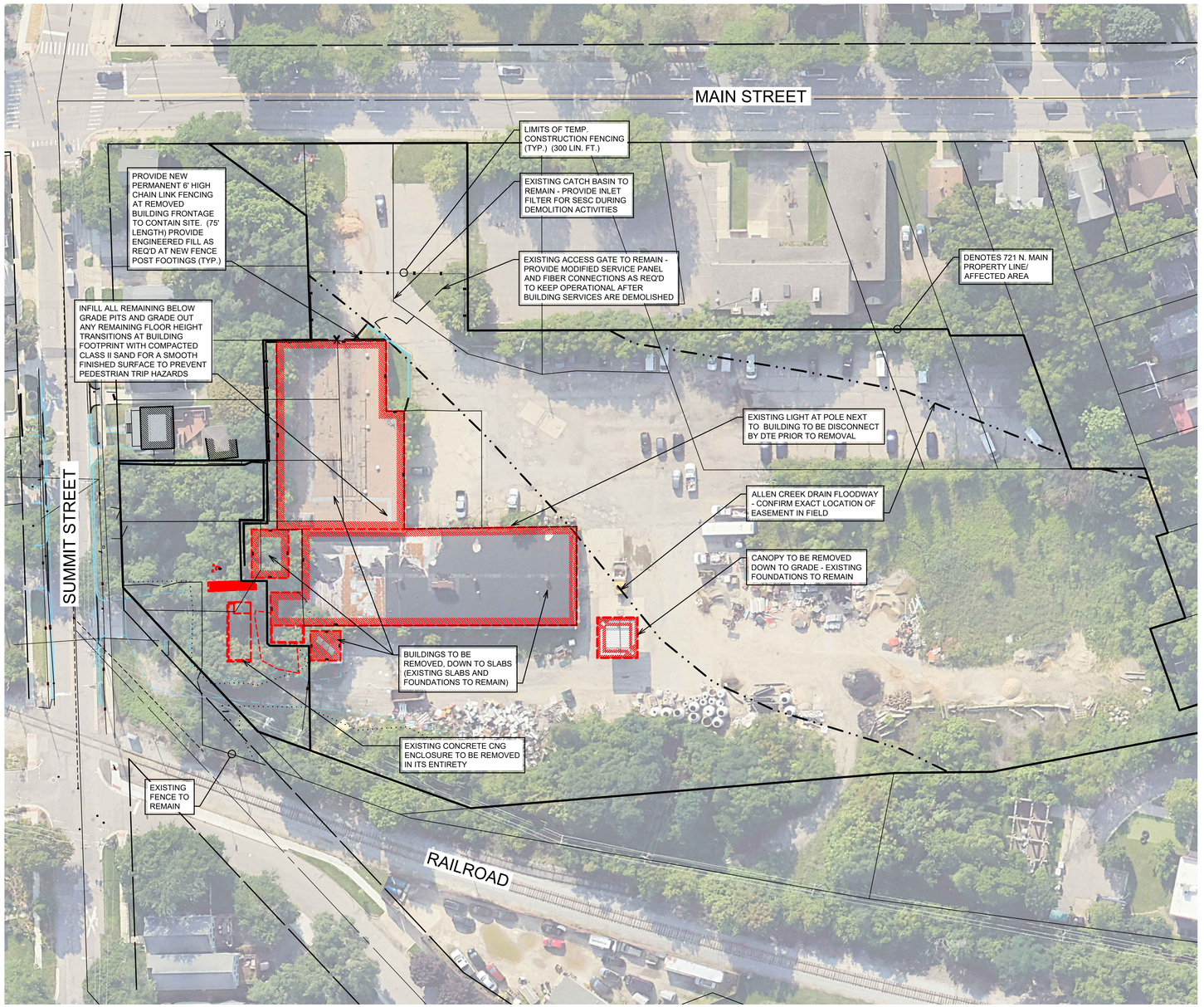
CITY OF ANN ARBOR WATER UTILITIES

Street Name	N MAIN ST	Tap Number		Fence Line	
Street Number	721	Size	1.5	Main to Curb Box	Feet
Lot Number		Material	Copper	Cover	
Property ID		Disconnected	☐	Main Size	
				ROW in Feet	0
Date	12/11/1952	Initial	ALT		
Remarks	Tap runs along E side of City drive cuts under fench just E of E gate post and	Verified	☐		
		QAQC Initial			
Sketch	☑				

Tap Location Description

Rec Numt	Description
10158	2' W of WPL of 128 Felch St
10158	43' to go 90o then E 40' to Corp. On PL

CITY OF ANN ARBOR WATER UTILITIES



SITE DEMOLITION PLAN
SCALE: 1" = 40'-0"

N

LEGEND

LIMITS OF BUILDING DEMOLITION

X / A-X — DENOTES PHOTO NUMBER & SHEET LOCATION

GENERAL NOTES:

1. DEMOLITION CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UTILITY STUBS TO THE BUILDING AND COORDINATE TERMINATIONS OF LINES AT EDGE OF PROJECT AREA WITH CITY OF ANN ARBOR DPW.
2. DEMOLITION CONTRACTOR SHALL SUBMIT TO ENGINEER A PLAN SHOWING A 6'-0" CHAIN LINK PERIMETER FENCE AT DEMOLITION LIMITS AND A SILT FENCE FOR SOIL EROSION AND SEDIMENTATION CONTROL.
3. ALL REMAINING EXISTING BUILDINGS AND SITE COMPONENTS IN THE VICINITY ARE TO BE PROTECTED FROM DAMAGE.
4. ALL UTILITY INFORMATION IS BASED ON REFERENCE DRAWINGS AND MUST BE FIELD VERIFIED PRIOR TO THE START OF DEMOLITION ACTIVITIES.
5. CONTRACTOR IS TO PROVIDE TEMPORARY POWER AS REQUIRED.
6. REFER TO HAZARDOUS MATERIAL REPORT FOR REMEDIATION REQUIREMENTS AT BUILDING.
7. ALL WORKERS MUST HAVE MIOSHA LEAD IN CONSTRUCTION TRAINING PRIOR TO STARTING WORK.
8. PROVIDE PEDESTRIAN PROTECTION DURING DEMOLITION ACTIVITIES PER MICHIGAN BUILDING CODE SECTIONS 3303 AND 3306.
9. DEMOLITION AND ELECTRICAL PERMITS ARE REQUIRED TO BE OBTAINED WITH THE CITY OF ANN ARBOR AS PART OF THIS WORK SCOPE.

PROJECT NOTES:

1. DEMOLITION WORK AT THIS SITE IS PERMITTED TO TAKE PLACE AT THE CONTRACTOR'S DISCRETION WITH INPUT FROM THE OWNER - COORDINATE SCHEDULE WITH OWNER PRIOR TO START OF DEMOLITION.
2. THE BUILDINGS ARE TO BE REMOVED IN THEIR ENTIRETY, DOWN TO THE EXISTING MAIN LEVEL FLOOR SURFACES. EXISTING SLABS, FOUNDATIONS, AND BELOW-GRADE STRUCTURES TO REMAIN, U.N.O..
2. SANITARY LEADS AT BUILDING HAVE BEEN DISCONNECTED BY THE DPW - ALL REMAINING PIPING PENETRATING THROUGH SLABS ARE TO BE CAPPED FLUSH AT GRADE.
3. WATER LEADS AT BUILDING HAVE BEEN DISCONNECTED BY DPW - ALL REMAINING PIPING PENETRATING THROUGH SLABS ARE TO BE CAPPED FLUSH AT GRADE. CONTRACTOR WILL BE REQUIRED TO SUPPLY THEIR OWN WATER FOR DEMOLITION PROCEEDINGS
4. ANY STORM DRAIN LINES CONNECTED TO BUILDING ARE TO BE REMOVED ABOVE GRADE AND CAPPED FLUSH AT SLAB PENETRATIONS.
5. ANY REMAINING BELOW GRADE UTILITY STRUCTURES TO BE CRACKED AND FILLED WITH PEA GRAVEL TO PREVENT PONDING.
6. ELECTRICAL AND FIBER INFRASTRUCTURE AT BUILDING TO BE REWORKED AS NOTED TO MAINTAIN ELECTRICAL SERVICE TO ENTRANCE GATE. ALL REMAINING CONDUITS FOR DISCONNECTED SERVICES TO BE CAPPED FLUSH AT GRADE.
7. NATURAL GAS AND CNG LEADS AT BUILDINGS TO BE CUT AND CAPPED FLUSH AT GRADE. COORDINATE EXACT REQUIREMENTS WITH DPW.
8. NO PERMANENT WORK IS TO OCCUR WITHIN THE ALLEN CREEK DRAIN FLOODWAY.
10. ONCE BUILDING HAS BEEN REMOVED, CONTRACTOR SHALL PROVIDE COMPACTED CLASS II SAND BACKFILL AT SURFACES OF SLABS TO SMOOTH OUT ELEVATION CHANGES AT ALL REMAINING CURBS, PIT ENCLOSURES, SLAB EDGES, AND RAISED EQUIPMENT PADS. MAXIMUM SLOPE OF TRANSITIONS SHALL BE 1:2.

CITY OF ANN ARBOR
FOUNDED 1824 — INCORPORATED 1851
MICHIGAN

HRC
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WEB SITE: www.hrcengr.com

DATE	ADDITIONS AND/OR REVISIONS
06/10/24	ISSUED FOR BID
06/03/24	OWNER REVIEW

DESIGNED	AMM
DRAWN	AG
CHECKED	AMM
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

721 N. MAIN ST.
SITE DEMOLITION PLAN

HRC JOB NO. 20240292	SCALE AS NOTED
DATE June 2024	SHEET NO. D-9 OF

V:\2024\02\20240292\A\Sheets\D9_721-Plan_Plot.dwg
Melchior, Adrianna M.
ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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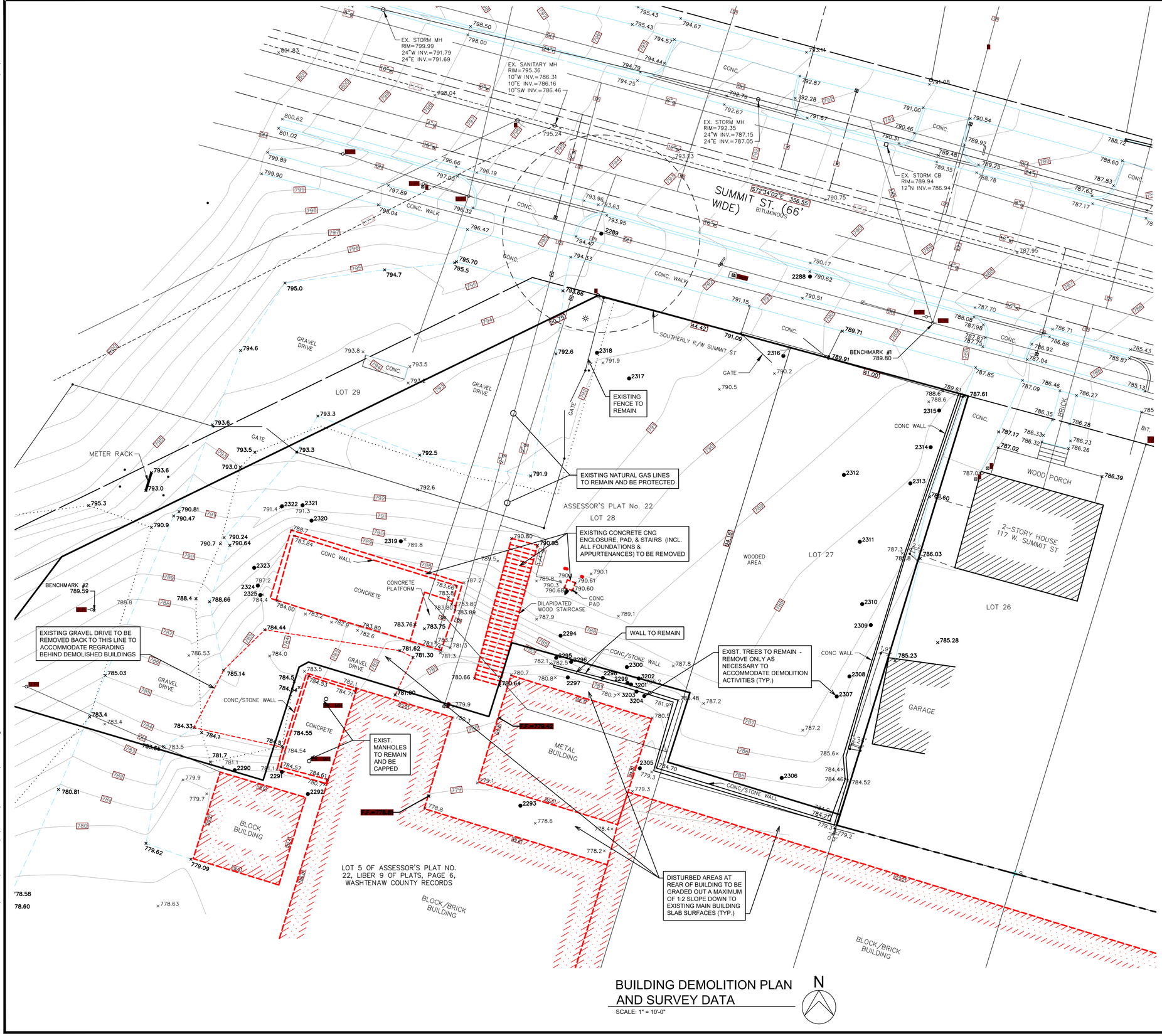

BUILDING DEMOLITION PLAN AND SURVEY DATA

SCALE: 1" = 10'-0"

LEGEND

838	EXIST. CONTOUR
×836.2	EXIST. SPOT ELEVATION
U.P.	EXIST. UTILITY POLE
	GUY WIRE
	EXIST. AC UNIT
OH	EXIST. OVERHEAD UTILITY LINE
	EXIST. LIGHT POLE
e	EXIST. ELECTRIC LINE
g	EXIST. GAS LINE
	EXIST. GATE VALVE IN BOX
	EXIST. GATE VALVE IN WELL
	EXIST. CURB STOP & BOX
r	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
s	EXIST. SANITARY SEWER
	SIGN
	ELECTRIC METER
	GAS METER
	POST
	FENCE
	SINGLE TREE
	TREE OR BRUSH LIMIT
F	FOUND IRON PIPE
IR	FOUND IRON ROD

TREE LIST

TAG#	DBH	COMMON NAME	GENUS/SPECIES	STEMS	SCORE	LM	INV
2288	12"	Siberian Elm	Ulmus pumila				X
2289	22"	Honey Locust	Gleditsia triacanthos		14	X	
2290	7"	Siberian Elm	Ulmus pumila				X
2291	7"	Tree-of-heaven	Ailanthus altissima				X
2292	10"	Tree-of-heaven	Ailanthus altissima	twin			X
2293	6"	Black Walnut	Juglans nigra				
2294	12"	Siberian Elm	Ulmus pumila				X
2295	18"	Siberian Elm	Ulmus pumila				X
2296	14"	Siberian Elm	Ulmus pumila				X
2297	22"	Siberian Elm	Ulmus pumila				X
2298	6"	American Elm	Ulmus americana				
2299	8"	American Elm	Ulmus americana				
2300	16"	Siberian Elm	Ulmus pumila				X
2301	11"	American Elm	Ulmus americana				
2302	8"	American Elm	Ulmus americana				
2303	7"	American Elm	Ulmus americana				
2304	6"	Box Elder	Acer negundo				
2305	11"	Tree-of-heaven	Ailanthus altissima				X
2306	7"	Tree-of-heaven	Ailanthus altissima				X
2307	7"	Tree-of-heaven	Ailanthus altissima	twin			X
2308	7"	Box Elder	Acer negundo				
2309	8"	Box Elder	Acer negundo				
2310	12"	Box Elder	Acer negundo				
2311	6"	Cottonwood	Populus deltoides				
2312	8"	Cottonwood	Populus deltoides	twin			
2313	7"	Norway Spruce	Picea abies				
2314	9"	Siberian Elm	Ulmus pumila	twin			X
2315	8"	Tree-of-heaven	Ailanthus altissima	twin			X
2316	7"	Siberian Elm	Ulmus pumila				X
2317	7"	Siberian Elm	Ulmus pumila				X
2318	6"	Tree-of-heaven	Ailanthus altissima				X
2319	6"	Tree-of-heaven	Ailanthus altissima				X
2320	9"	Tree-of-heaven	Ailanthus altissima	twin			X
2321	8"	Siberian Elm	Ulmus pumila				X
2322	10"	Siberian Elm	Ulmus pumila				X
2323	7"	Tree-of-heaven	Ailanthus altissima	twin			X
2324	7"	Tree-of-heaven	Ailanthus altissima				X
2325	9"	Tree-of-heaven	Ailanthus altissima				X
2326	13"	Blue Spruce	Picea pungens				

CITY OF ANN ARBOR
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06/03/24	OWNER REVIEW

DESIGNED	AMM
DRAWN	AMM
CHECKED	AMM
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

721 N. MAIN
BUILDING DEMOLITION
PLAN AND SURVEY DATA

HRC JOB NO. 20240292	SCALE 1"=10'
DATE June 2024	SHEET NO. D-10 OF

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)

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PHOTO NO. 01

EXISTING BUILDING TO BE REMOVED IN ITS ENTIRETY DOWN TO SLAB (TYP.)

PHOTO NO. 02

EXISTING CANOPY AND BOLLARDS TO BE REMOVED DOWN TO SLAB (TYP.)

PHOTO NO. 03

EXISTING BUILDING TO BE REMOVED IN ITS ENTIRETY DOWN TO SLAB (TYP.)

PHOTO NO. 04

EXISTING BUILDING TO BE REMOVED DOWN TO SLAB

PHOTO NO. 05

EXISTING WOOD STAIR TO BE REMOVED IN ITS ENTIRETY, INCLUDING ANY FOUNDATIONS

PHOTO NO. 06

EXISTING GATE TO REMAIN - PROVIDE NEW POURED CONCRETE FOOTING AND SUPPORT POST AT CORNER WHERE BUILDING IS BEING DEMOLISHED

PROVIDE NEW PERMANENT 6' HIGH CHAIN LINK FENCING AT REMOVED BUILDING FRONTAGE TO CONTAIN SITE. PROVIDE ENGINEERED FILL AS REQ'D AT NEW FENCE POST FOOTINGS (TYP.)

PHOTO NO. 07

REMOVE DEBRIS DIRECTLY ADJACENT TO BUILDING AS PART OF SITE CLEANUP (TYP.)

PHOTO NO. 08

EXISTING SHED TO BE REMOVED - RAILROAD SPUR LINE TO REMAIN

PHOTO NO. 09

EXISTING CNG ENCLOSURE TO BE REMOVED IN ITS ENTIRETY, INCLUDING ANY FOUNDATIONS

PHOTO NO. 10

ALL BUILDING COMPONENTS ABOVE GRADE TO BE REMOVED - HAZARDOUS MATERIALS TO BE REMEDIATED PER SPECS. (TYP.)

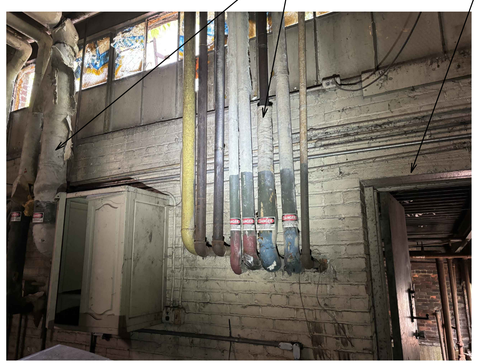

PHOTO NO. 11

ALL ELECTRICAL EQUIPMENT TO BE REMOVED AND CONDUITS TO BE CAPPED FLUSH AT GRADE (TYP.)

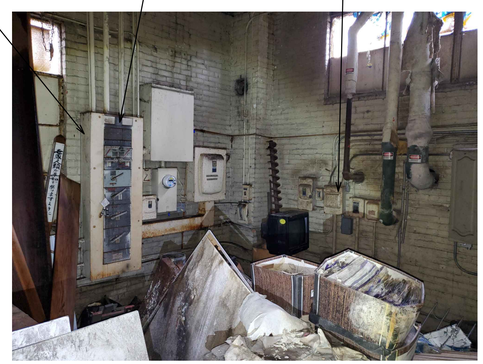

PHOTO NO. 12

CITY OF ANN ARBOR
FOUNDED 1824 INCORPORATED 1851 MICHIGAN

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06/03/24	OWNER REVIEW

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DRAWN	AG
CHECKED	AMM
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

721 N. MAIN
REFERENCE PHOTOS

HRC JOB NO. 20240292	SCALE AS NOTED
DATE June 2024	SHEET NO. D-11 OF

v:\2024\02\20240292\A\Sheets\D11_721-Photos_Plot.dwg
Melchior, Adrianna M.
ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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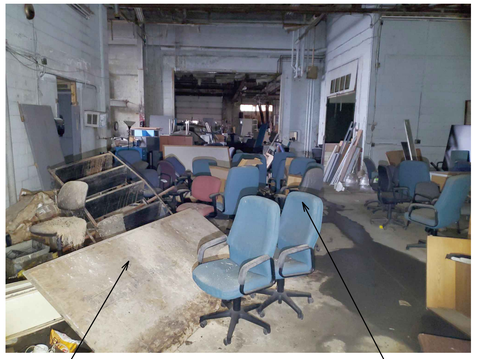
PHOTO NO. 13

ALL BUILDING CONTENTS TO BE REMOVED AS PART OF BUILDING DEMOLITION (TYP.)



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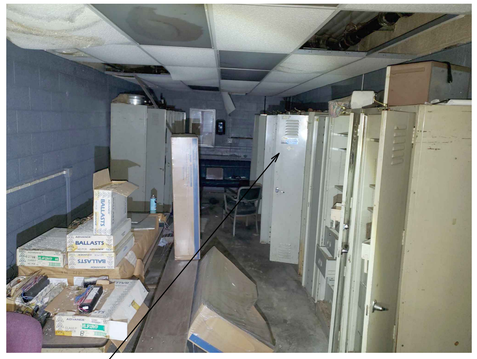


ALL BUILDING CONTENTS TO BE REMOVED AS PART OF BUILDING DEMOLITION (TYP.)

PHOTO NO. 15

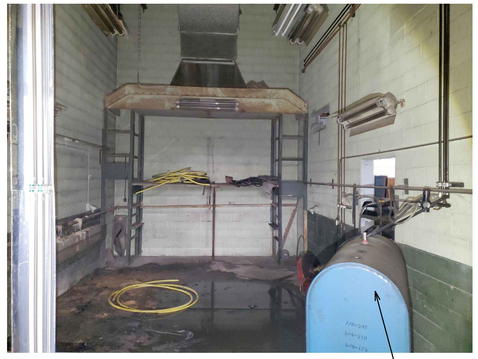


PHOTO NO. 16

FUELS, SOLVENTS AND OTHER HAZARDOUS MATERIALS TO BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH ALL CITY, STATE AND FEDERAL REQUIREMENTS (TYP.)

PHOTO NO. 17

PORTIONS OF EXISTING CONCRETE WALLS ABOVE GRADE AT THIS LOCATION TO BE SAWCUT AND REMOVED DOWN TO GRADE (TYP.)

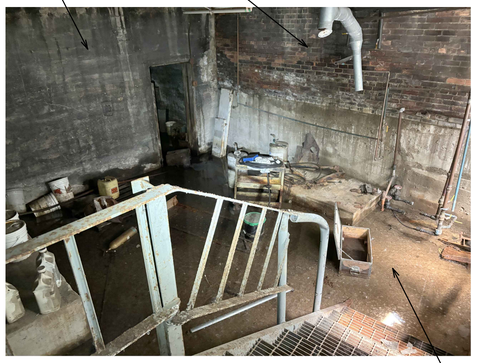
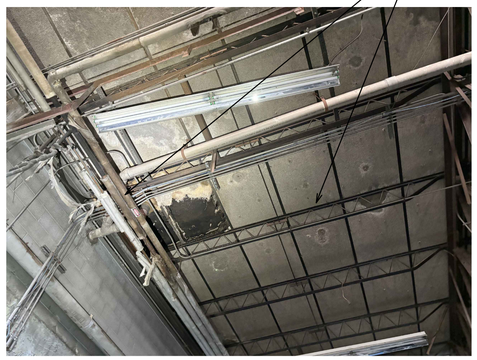


PHOTO NO. 18



ALL BUILDING CONTENTS TO BE REMOVED AS PART OF BUILDING DEMOLITION (TYP.)

PHOTO NO. 19

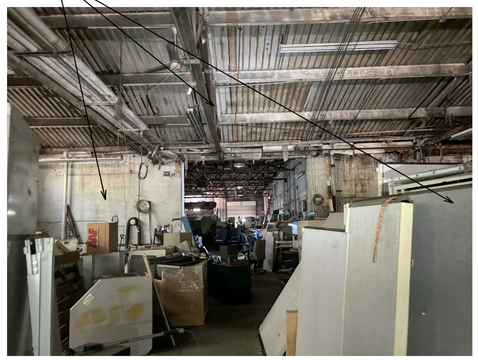


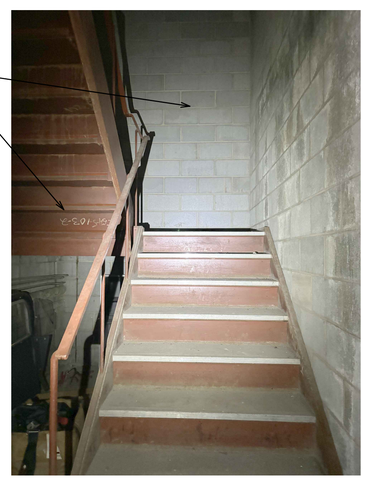
PHOTO NO. 20

INFILL ALL REMAINING BELOW GRADE PITS AND GRADE OUT ANY REMAINING FLOOR HEIGHT TRANSITIONS AT BUILDING FOOTPRINT WITH COMPACTED CLASS II SAND FOR A SMOOTH FINISHED SURFACE TO PREVENT PEDESTRIAN TRIP HAZARDS

ALL BUILDING CONTENTS TO BE REMOVED AS PART OF BUILDING DEMOLITION (TYP.)

ALL FLOOR PENETRATIONS TO BE CAPPED FLUSH AT GRADE (TYP.)

PHOTO NO. 21



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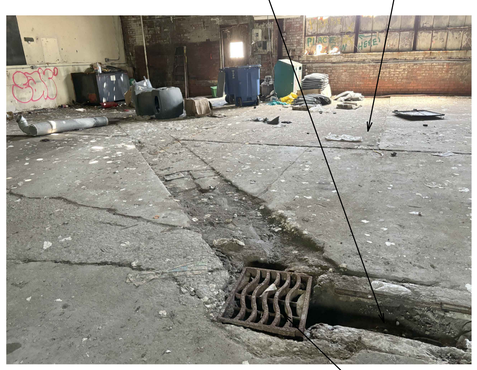
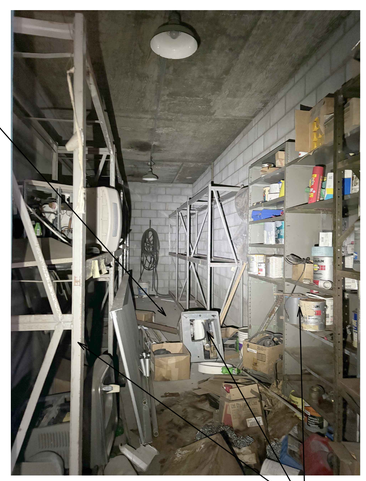


ALL FLOOR PENETRATIONS TO BE CAPPED FLUSH AT GRADE (TYP.)

PHOTO NO. 23

EXISTING GRADE LEVEL SLABS TO REMAIN (TYP.)



ALL BUILDING CONTENTS TO BE REMOVED AS PART OF BUILDING DEMOLITION (TYP.)

PHOTO NO. 24

CITY OF ANN ARBOR
FOUNDED 1824
INCORPORATED 1851
MICHIGAN

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06/10/24	ISSUED FOR BID
06/03/24	OWNER REVIEW

DESIGNED	AMM
DRAWN	AG
CHECKED	AMM
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

721 N. MAIN
REFERENCE PHOTOS

HRC JOB NO. 20240292	SCALE AS NOTED
DATE June 2024	SHEET NO. D-12 OF

V:\2024\20240292\A\Sheets\D12_721-Photos_Plot.dwg
Melchior, Adrianna M.
ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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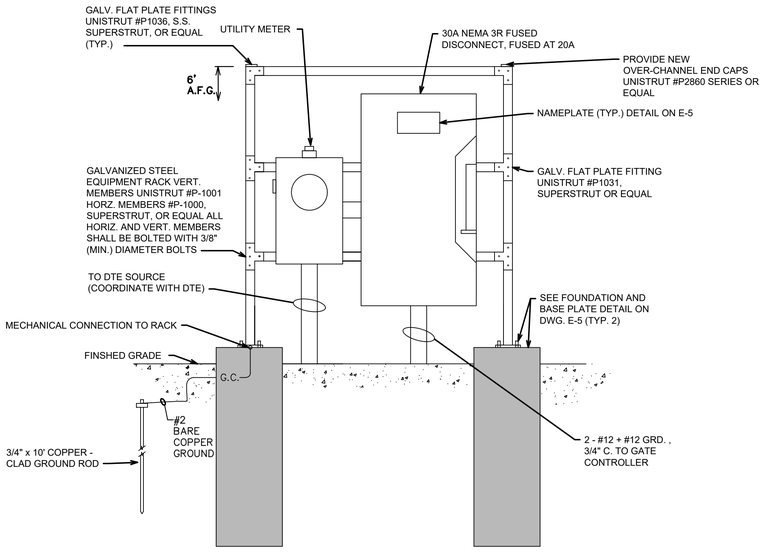
Melchior, Adrianna M.

IMPORTANT: ELECTRICAL CONTRACTOR IS TO COORDINATE WITH DTE REGARDING RELOCATION OF ALL DTE EQUIPMENT (METERS, TRANSFORMERS, ETC.) AND ELECTRIC SHUTOFFS. ELECTRICAL CONTRACTOR MUST HAVE FAMILIARITY WITH THIS TYPE OF WORK WITHIN DTE SERVICE TERRITORY. AFTER CONTRACT IS AWARDED, ELECTRICAL CONTRACTOR IS TO CONTACT DTE TO HAVE A PLANNER CREATE THE WORK REQUEST FOR EACH SITE SEPARATELY.



* EXACT WIDTH OF SUPPORT RACK SHALL BE DETERMINED BY THE EQUIPMENT SUPPLIED.

EQUIPMENT SUPPORT RACK ON CONCRETE SLAB DETAIL

N.T.S.

ELECTRICAL SITE PLAN-PROPOSED WORK

SCALE: 1" = 10'

0 5 10 20

N

PHOTO NO. 01

CITY OF ANN ARBOR
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06/03/24	OWNER REVIEW

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DRAWN	DJK
CHECKED	MJR
APPROVED	JFB

CITY OF ANN ARBOR

BUILDING DEMOLITION PROJECT

721 N. MAIN
ELECTRICAL PROPOSED PLAN

HRC JOB NO. 20240292	SCALE AS NOTED
DATE June 2024	SHEET NO. E-7 OF

ORIGINAL PLOT SIZE: ARCH FULL BLEED D (36.00 X 24.00 INCHES)
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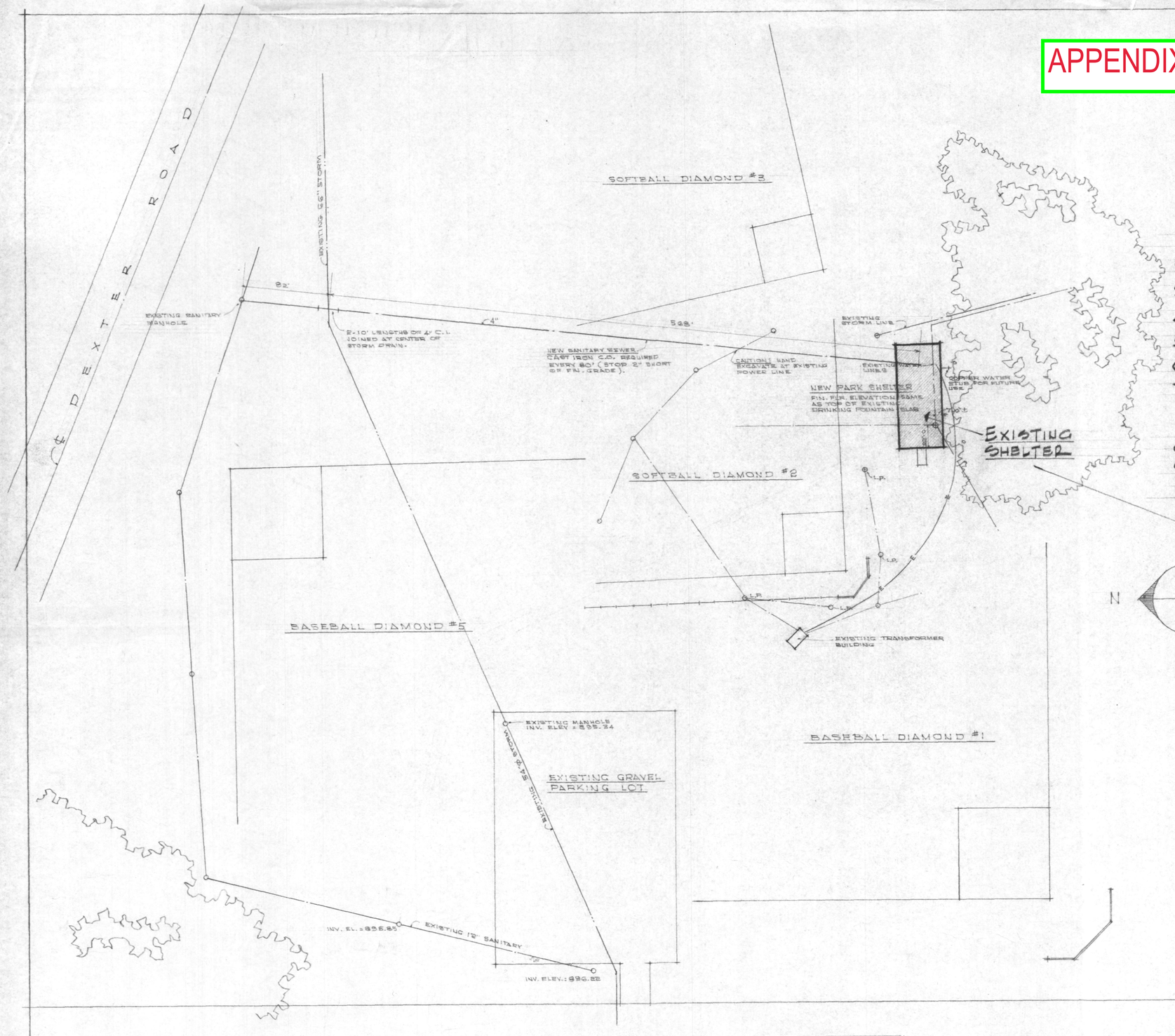
APPENDIX B - BUILDING REFERENCE DRAWINGS



INDEX TO DRAWINGS

1. PLOT PLAN
2. FOUNDATION & FOOTING PLAN
3. FLOOR PLAN
4. ELEVATIONS & DETAILS
5. BUILDING SECTIONS & DETAILS
6. ROOF FRAMING PLAN
7. MECHANICAL & ELECTRICAL PLAN

SPECIFICATIONS

8. GENERAL CONDITIONS · EXCAVATING & GRADING · CONCRETE · MASONRY · STRUCT. & MISC. METALS · CARPENTRY & MILLWORK.
9. ROOF & SHEET MET. · HOLLOW MET. FRAMES · TOILET PARTITIONS · ASPHALT PAVERS · PAINTING & CAULKING · PLUMBING
10. ELECTRICAL

NOTE: CONTRACTOR SHALL CONSULT THE REVISED SPECIFICATIONS FOR CHANGES AND ADDITIONS TO ABOVE ORIGINAL SPECS.

SEE SHT. 2 FOR KEY TO NEW WORK TO BE DONE ON EXISTING BUILDING.

N

DOOR SCHEDULE

REVISED
PLOT PLAN

SCALE 1" = 50'-0"

REVISED · APRIL 23, 1971
REVISED AUG. 17, 1973

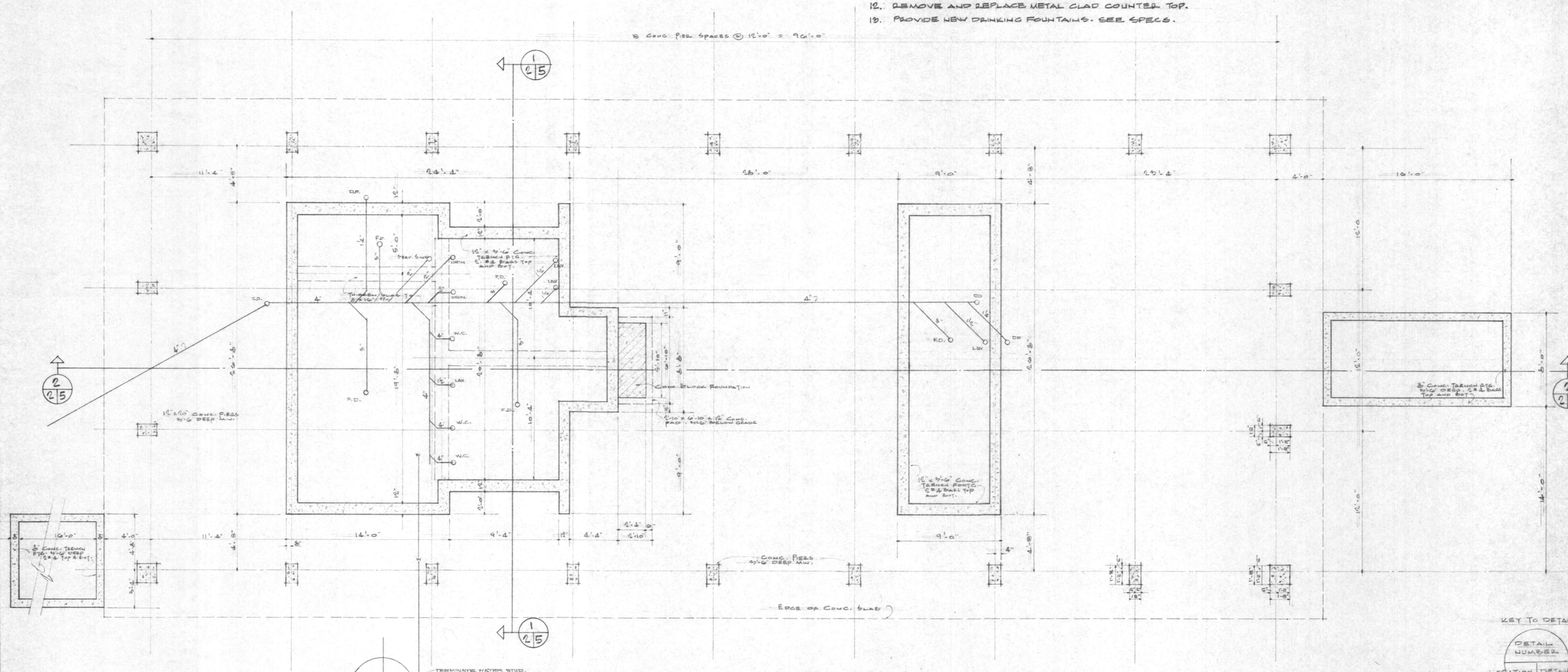
PROJECT	OWNER	ARCHITECT	JOB # 0463
RENOVATIONS TO VETERANS PARK SHELTER ANN ARBOR, MICHIGAN	CITY of ANN ARBOR	JAMES P. WONG & ASSOC. 2378 E. STADIUM BLVD. ANN ARBOR, MICHIGAN	1

KEY TO NEW WORK TO BE DONE ON EXISTING BUILDING

NOTE: (3) INDICATES NUMBERS ON DRAWINGS CORRESPONDING TO THE FOLLOWING NUMBERED ITEMS.

1. REMOVE AND REPLACE APPROX. 1/2 OF DAMAGED BRICK PIER.
2. RESET, LEVEL AND REGROUT EXISTING WOOD BEAM ANCHORS.
3. REMOVE AND REPLACE CHIPPED AND DAMAGED BRICKWORK.
4. REMOVE TOP 8" OF MASONRY WALL AND RE-PLACE INCLUDING WOOD PLATE ANCHOR BOLTS.
5. REMOVE AND REPLACE ENTIRE BRICK AND BLOCK WALLS INCLUDING CHIMNEY AND FIREPLACE. LIMITS OF DEMOLITION ARE APPROXIMATE AND MASON SHALL USE HIS DISCRETION TO FACILITATE KEEPING IN HIS WORK.
6. REMOVE EXISTING DOORS AND FRAMES AND RE-PLACE WITH NEW. SEE DOOR SCHED. AND SPECS.
7. SAND AND REFINISH EXISTING DOOR AND FRAME.
8. ENLARGE EXISTING MASONRY OPENING AND FURNISH NEW LINTEL, OVERHEAD DOOR AND FRAME.
9. STEAM CLEAN, OR USE OTHER METHOD AS NECESSARY TO CLEAN EXISTING MASONRY WALLS.
10. RESET SECURELY BENCH ANCHOR SUPPORTS.
11. REPLACE EXIST'G. WOOD BENCHES WITH CONCRETE TYPE AS DETAILED.
12. REMOVE AND REPLACE METAL CLAD COUNTER TOP.
13. PROVIDE NEW DRINKING FOUNTAINS. SEE SPECS.
14. REMOVE EXISTING TOILET PARTITIONS AND REPLACE WITH NEW. SEE SPECS.
15. REMOVE ALL EXIST'G. PLUMBING FIXTURES AND REPLACE WITH NEW.
16. PROVIDE ENTIRE NEW ROOF STRUCTURE INCLUDING WOOD SUPPORTING BEAMS, TRUSSES, SHINGLES, FASCIA, ANCHORS, BLOCKING, LOUVERS AND ALL NECESSARY MATERIALS AND LABOR AS REQUIRED.
17. PROVIDE 14 NEW REMOVEABLE WALL PANELS AS SHOWN AND SPECIFIED.
18. PATCH DAMAGED WATER LINE AS REQUIRED.
19. PROVIDE ALL NEW LIGHTING FIXTURES AS INDICATED IN LIGHTING SCHEDULE AND AS SPECIFIED.
20. PROVIDE NEW WALL OUTLET AND WIRING AS REQ'D.
21. PROVIDE NEW ELECTRIC SPACE HEATING EQUIPM'T. WHERE SHOWN AND AS SPECIFIED.
22. PROVIDE NEW EXHAUST FAN AS SPECIFIED.
23. PROVIDE NEW SWITCHES AND WIRING.
24. PROVIDE NEW ELECT. HOT WATER HEATER.
25. PROVIDE NEW LIGHT PANEL AND SAFETY SWITCH.
26. PROVIDE WOOD COUNTER-TOPS THROUGHOUT.

8 Conc. Pier Spaces @ 12'-0" = 96'-0"



FOOTING & FOUNDATION PLAN

SCALE 4"

NOTE: PLUMBING SHOWN IS SCHEMATIC.

KEY TO DETAIL

DETAIL NUMBER | LOCATION SHEET | DETAIL SHEET

REVISED APRIL 23, 1971

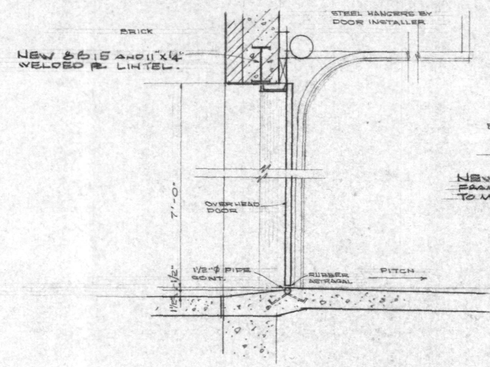
PROJECT	OWNER	ARCHITECT	Job No. 0463
RENOVATIONS TO VETERANS PARK SHELTER, ANN ARBOR, MICHIGAN	CITY of ANN ARBOR	JAMES P. WONG & ASSOC. 2378 E. STADIUM BLVD. ANN ARBOR, MICHIGAN	DATE 6-27-69 2

DOOR SCHEDULE

NO.	SIZE	TYPE	FRAME	REMARKS
1	10'-0" x 7'-0" x 1¾"	OVERHD. WOOD	STEEL - SEE THIS SHT	SEE ELEVATION THIS SHT. NO. 4
2	2'-6" x 7'-0" x 1¾"	FLUSH WD. SOLID C.	HOLLOW METAL	SEE DET. THIS SHT.
3	3'-0" x 7'-0" x 1¾"	FLUSH HOLL. MET.	HOLLOW MET.	do
4	do	do	do	do
5	do	do	do	do
6	do	do	do	do
7	2'-6" x 7'-0" x 1¾"	do	do	SEE ELEV. AND DET. SHT. NO. 5
8	3'-0" x 7'-0" x 1¾"	do	do	do

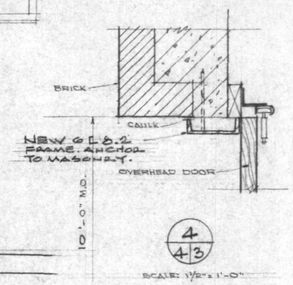
METAL THRESHOLDS REQ. ALL DOORS EXCEPT NO. 1, 3, 7.
INCLUDE IN HARDWARE ALLOWANCE

NOTE - ALL DOORS #2 THRU #8 SHALL HAVE PRECAST CONC. LINTELS 8"x8" WITH 2-#4 BARS AND 2½" x 3½" x ⅜" L BRICK LINTEL.



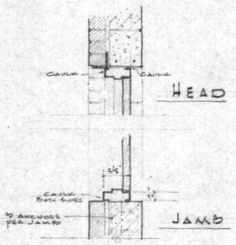
3/4|3

SCALE: 3/4" = 1'-0"

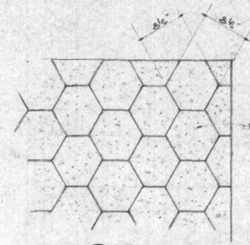


4/4|3

SCALE: 1½" = 1'-0"



• TYPICAL HOLLOW METAL FRAME DETAIL • SCALE 3"



• DETAIL PLAN OF ASPHALT PAVING BLOCKS • SCALE 1"=1'-0"

1/3|5

TYPICAL CONC. SLAB 9"DEEP W/ 2 #5 CONT. BOTTOM BARS

12" x 20" BRICK PIERS

4" CONC. SLAB 6'x6' @ #10 MESH CONT. WET U

DROPPED OVERHEAD BEAM

REMOVABLE WD PANELS SEE DETAILS SHT #4

ASPHALT PAVING BLOCKS ALTERNATE #1

FIREPLACE SEE DETAILS SHTS & ALTERNATE #1

MET. THRESH.

P.O.

UTILITY

SERVICE SINK

MEN

WOMEN

W.C.

LAV.

U.C.

TRACTOR RM. & STORAGE

F.D.

20"x28'-0" ATTIC ACCESS PANEL

PITCH

OVERHEAD GARAGE DR.

BALANCE OPG. 12'-10"x8'-0"

SILL CAST BELOW BRICK

WOOD BLOCK SEE 5/3|5

CONCESSION

METAL CLAD COUNTER TOP SEE DET. THIS SHT.

WOOD COUNTER & SHELVES BELOW

3 SHELVES W.C.

J&T PLYWOOD PANEL WOOD PARTITION CONT. CEILING FOR POSSIBLE WALL REMOVAL

BASEBALL EQUIPMENT

SHELVING W.C.

ASPHALT PAVING BLOCKS ALTERNATE #2

WOOD BENCH 6/3|5

CONC. CAP

BRICK PLANTER

EXP. JT. FILLER CONC. CAP EXP. JOINTS IN ALL BLOCKS

WATERPROOF

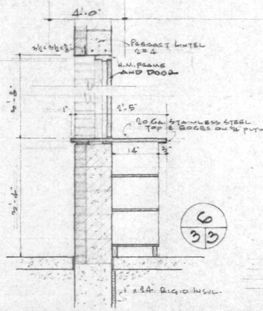
4 BLOCKS

• CONCRETE CAP DETAIL • SCALE 3"

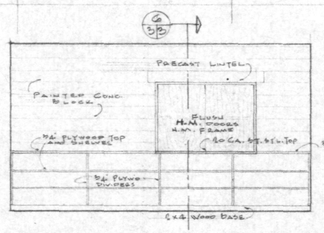
BRICK PLANTER

12'-5" 4'-0" 11'-4" 14'-0" 9'-4" 12'-0" 28'-0" 9'-0" 27'-4" 16'-0"

8 BRICK PIER SPACES @ 12'-0" = 96'-0"



6/3|3



6/3|5

• ELEVATION & DETAILS of CONCESSION COUNTER • SCALE 1" & ½"

N

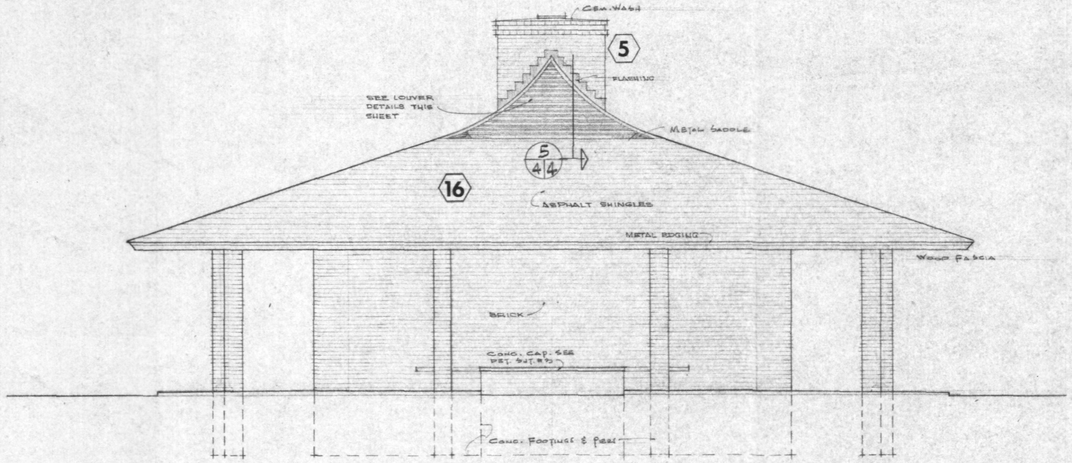
• FLOOR PLAN • SCALE 1"

KEY TO DETAILS

DETAIL NUMBER | LOCATION SHEET | DETAIL SHEET

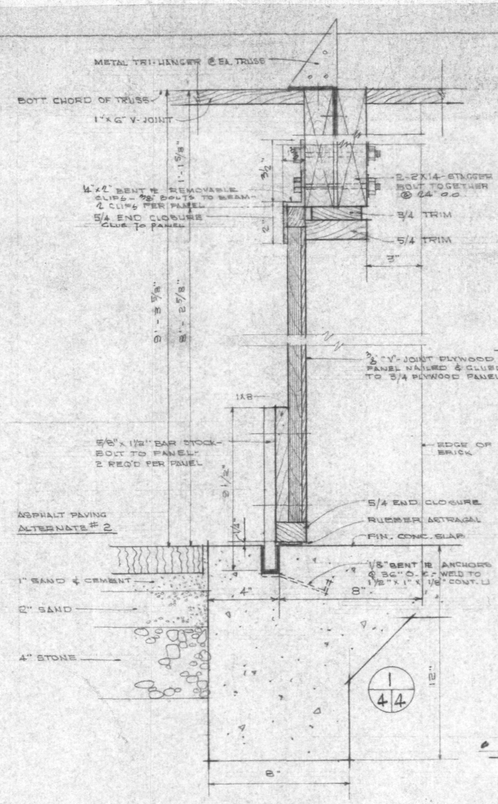
REVISED APRIL 23, 1971

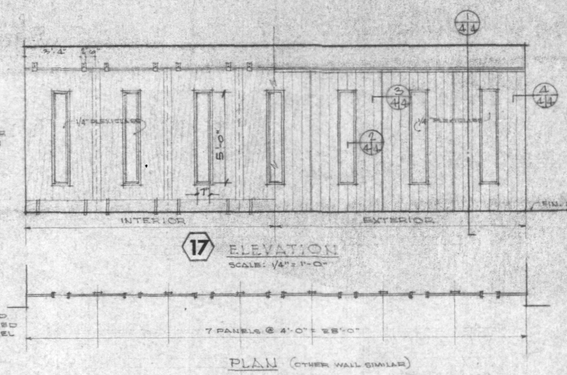
PROJECT	OWNER	ARCHITECT	JOB NO. 0269 DATE 6-27-69
VETERANS PARK SHELTER ANN ARBOR, MICHIGAN	CITY of ANN ARBOR	JAMES P. WONG & ASSOC. 2576 E. STADIUM BLVD. ANN ARBOR, MICHIGAN	3



SOUTH ELEVATION

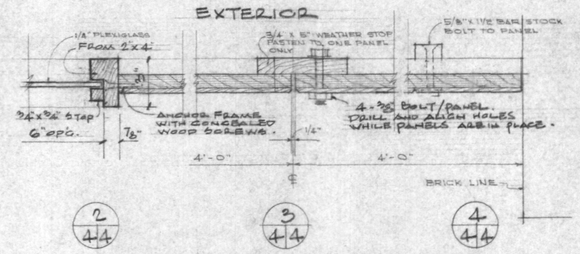
NORTH ELEVATION SIMILAR





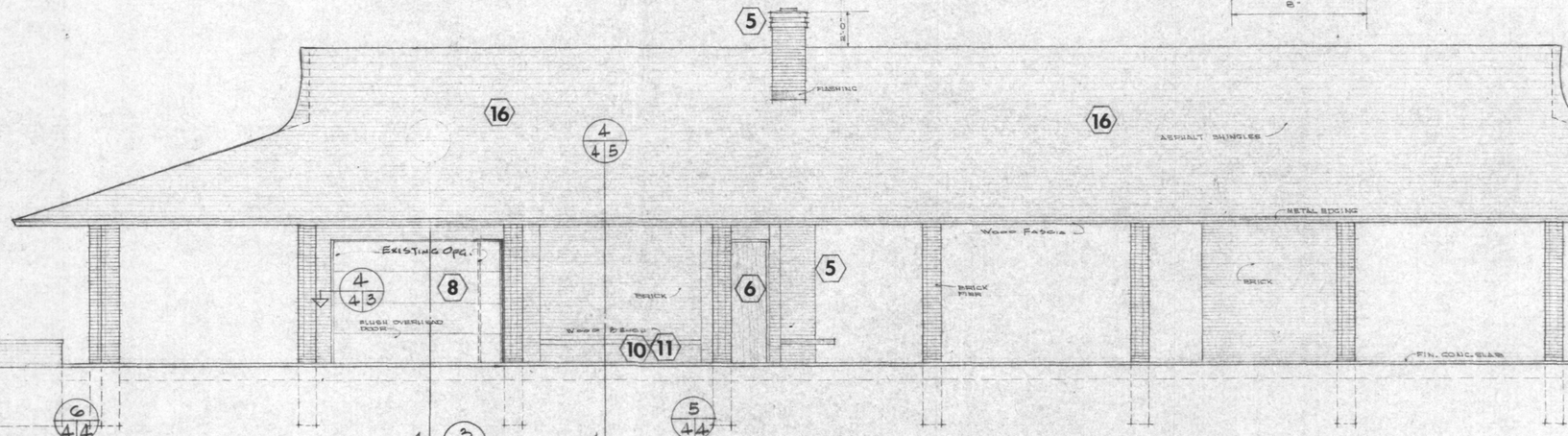
PLAN (other wall similar)

Scale: 1/4" = 1'-0"



REMOVABLE WOOD PANEL DETAILS

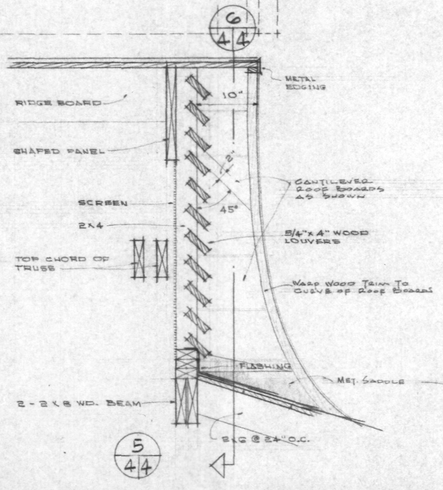
SCALE: 3" = 1'-0"

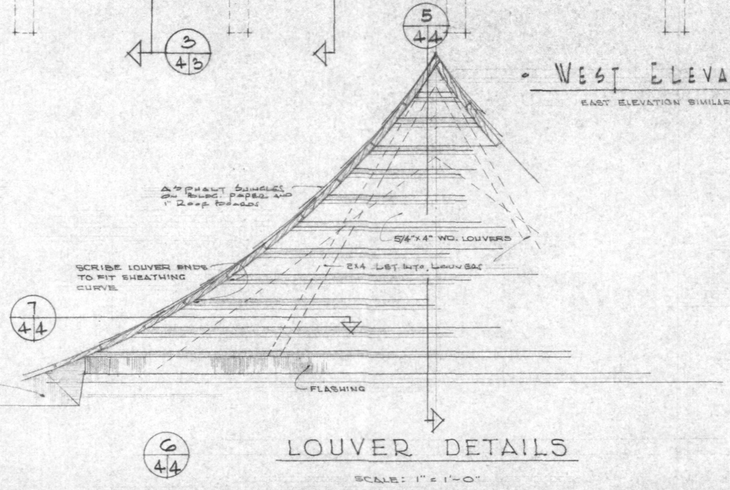


WEST ELEVATION

SCALE 4"

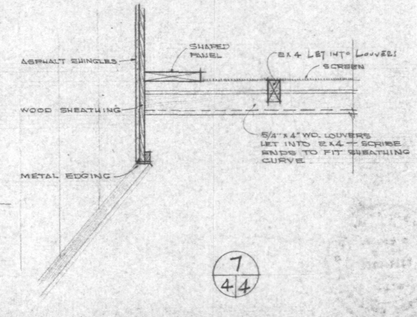
EAST ELEVATION SIMILAR





LOUVER DETAILS

SCALE: 1" = 1'-0"



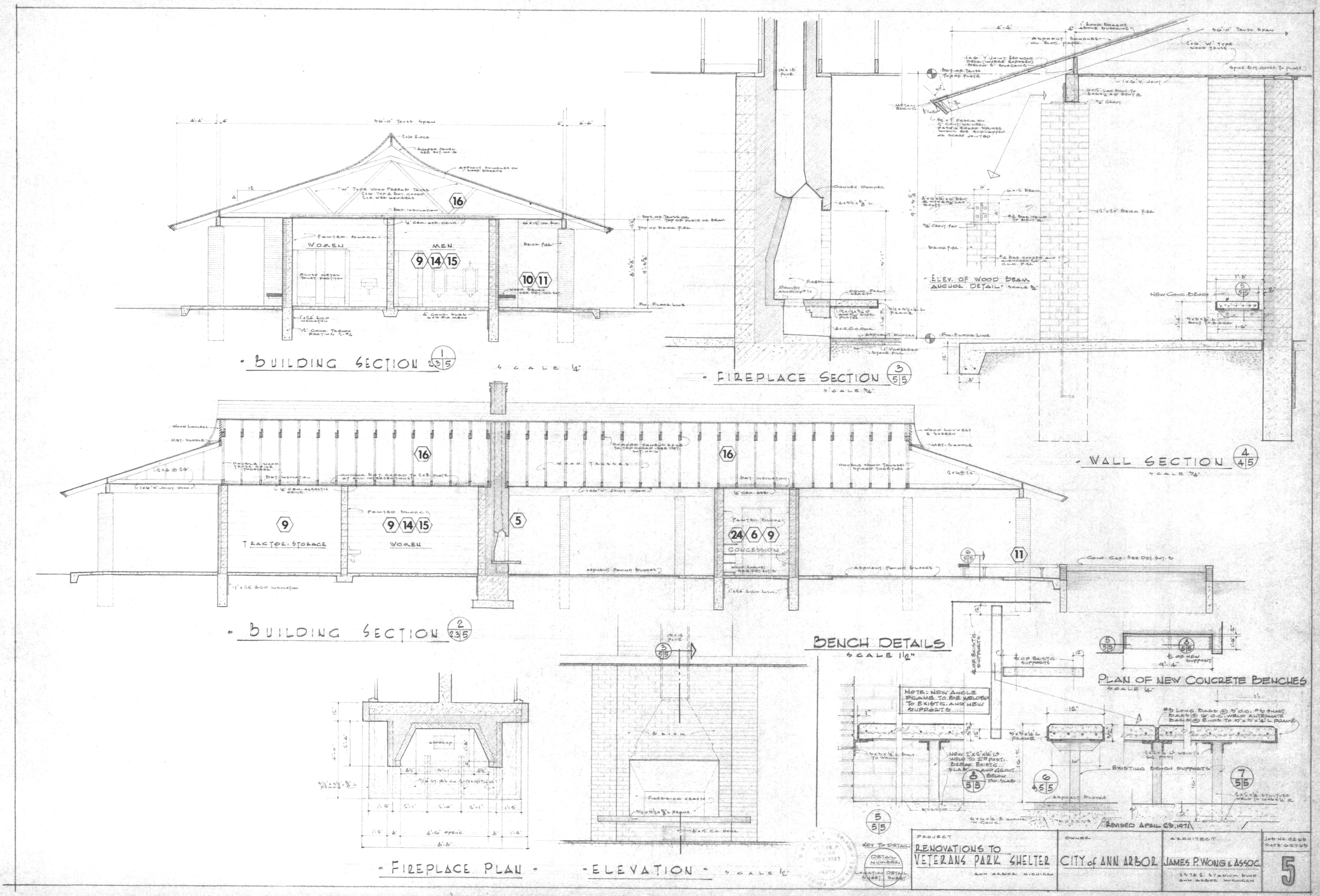
Key to details

DETAIL NUMBER

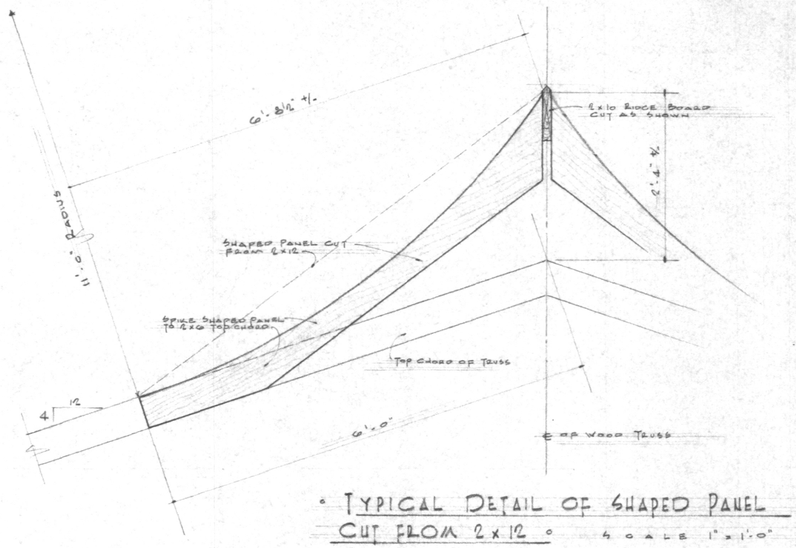
LOCATION SHEET | DETAIL SHEET

Revised April 23, 1971

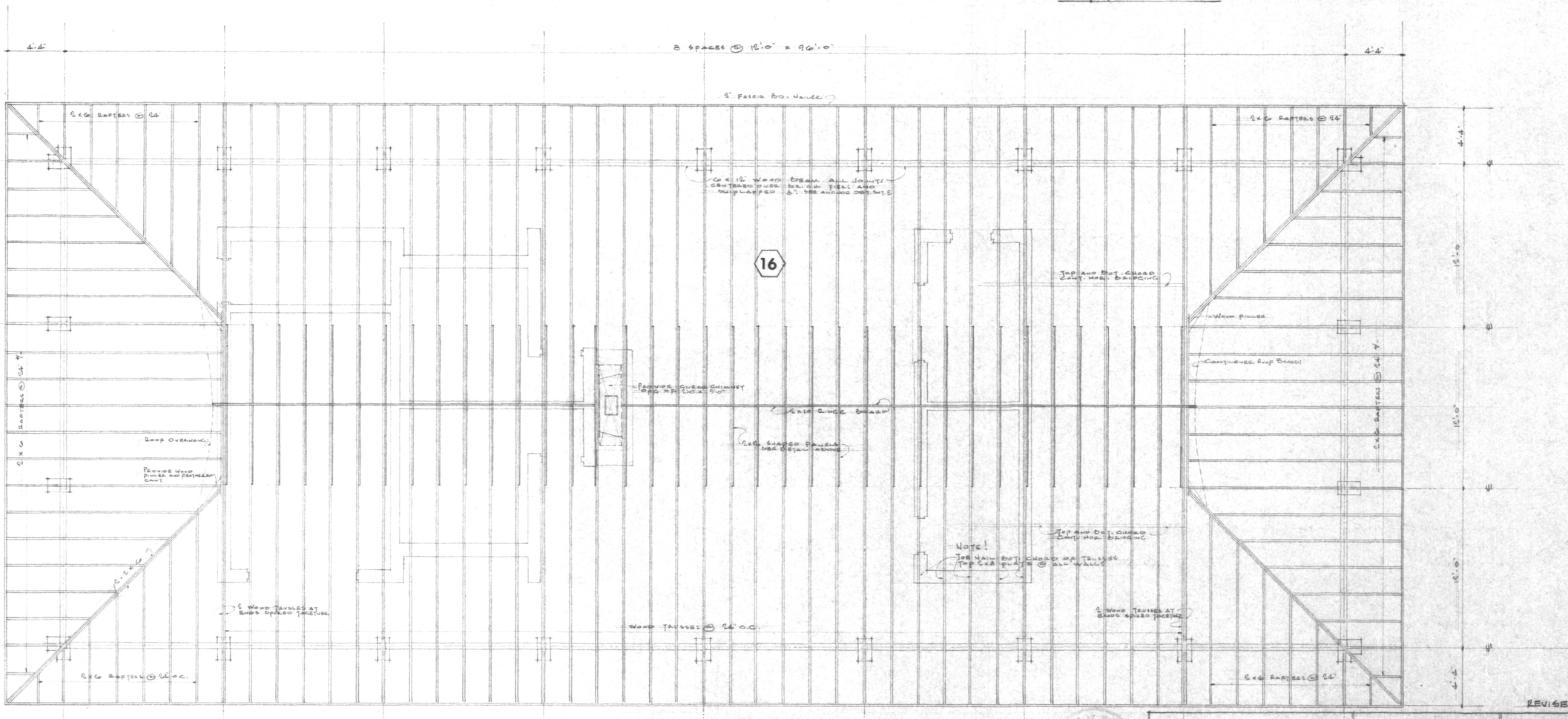
Project	Owner	Architect	Job No. 0669 Date 6-10-69
Renovations to Veterans Park Shelter, Ann Arbor Michigan	City of Ann Arbor	James P. Wong & Assoc. 2978 E. Stadium Blvd. Ann Arbor, Michigan	4



BUILDING SECTION 1/2,3/5
SCALE 1/4"
FIREPLACE SECTION 3/5/5
SCALE 3/4"
ELEV. OF WOOD BEAM ANCHOR DETAIL SCALE 3/4"
WALL SECTION 4/4/5
SCALE 3/4"
BUILDING SECTION 2/2,3/5
TRACTOR STORAGE
WOMEN
CONCESSION
BENCH DETAILS
SCALE 1 1/2"
PLAN OF NEW CONCRETE BENCHES
SCALE 1/4"
FIREPLACE PLAN
ELEVATION
SCALE 1/2"
REVISED APRIL 23, 1971
KEY TO DETAIL
DETAIL NUMBER
LOCATION SHEET
DETAIL SHEET
PROJECT
RENOVATIONS TO VETERANS PARK SHELTER
ANN ARBOR MICHIGAN
OWNER
CITY of ANN ARBOR
ARCHITECT
JAMES P. WONG & ASSOC.
2378 E. STADIUM BLVD.
ANN ARBOR MICHIGAN
JOB NO. 0463
DATE 6-27-63
5



• TYPICAL DETAIL OF SHAPED PANEL CUT FROM 2 x 12 • SCALE 1" = 1'-0"



• ROOF FRAMING PLAN • SCALE 4"

REVISED APRIL 23, 1971

PROJECT	OWNER	ARCHITECT	JOB NO. & A/C DATE 6-27-69
RENOVATIONS TO VETERANS PARK SHELTER ANN ARBOR MICHIGAN	CITY of ANN ARBOR	JAMES P. WONG & ASSOC. 1818 E. STADIUM BLVD. ANN ARBOR MICHIGAN	6

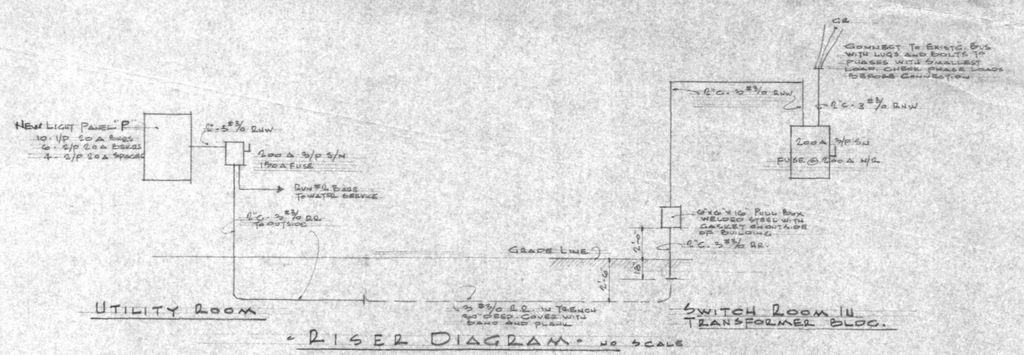
LIGHTING FIXTURE SCHEDULE

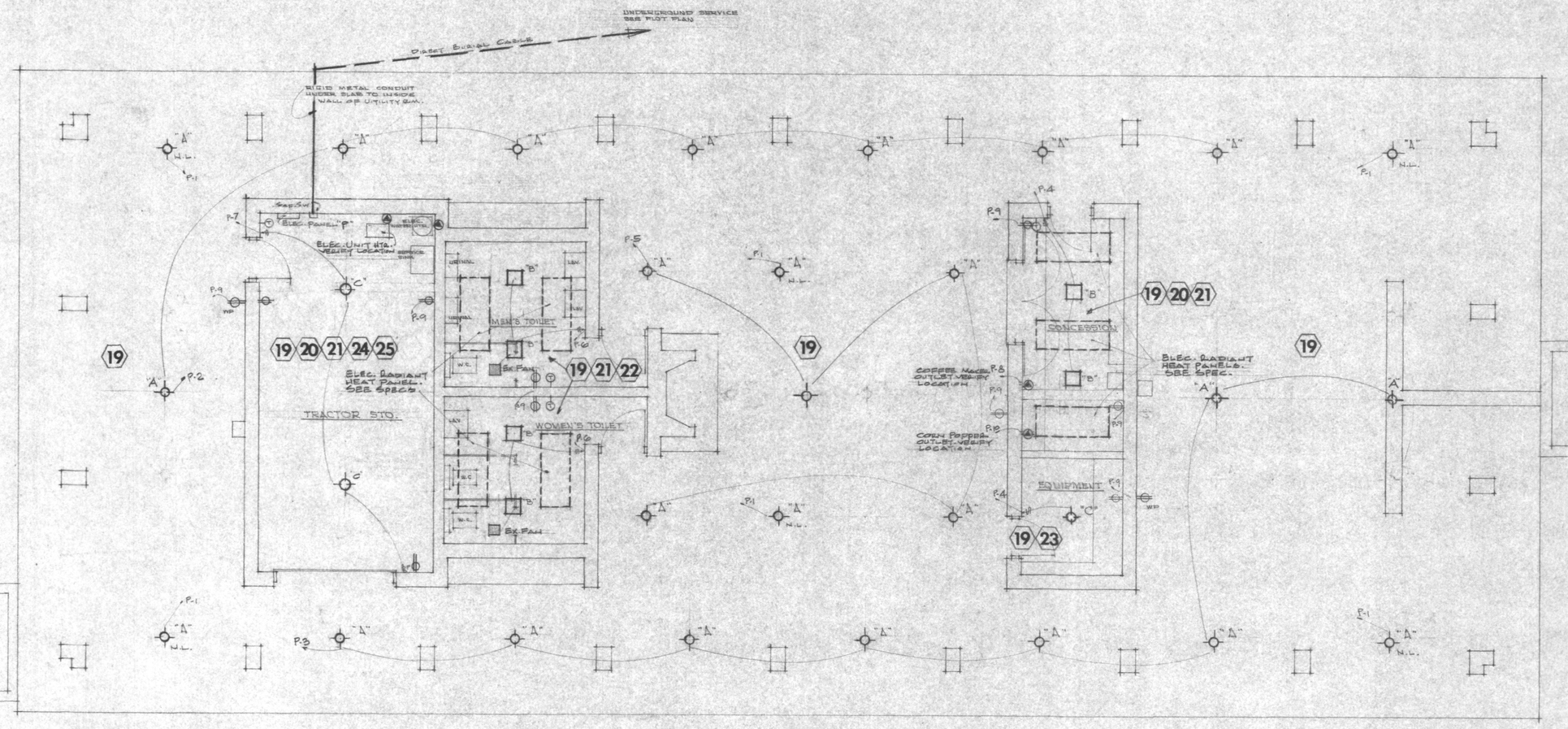
	TYPE	LAMPS NO	LAMPS WATTS	LAMP	MOUNTING	MANUFACTURER	CAT. NO.	FINISH	REMARKS
A	INCANDESCENT	2	100	A	SURFACE	KENALL	7805	WHITE	PROVIDE MOUNTING ADAPTER
B	INCANDESCENT	1	100	A	SURFACE	KENALL	5188	WHITE	DO
C	INCANDESCENT	1	100	A	SURFACE		PORCELAIN RECEP.		

ELECTRICAL SYMBOLS

	INCANDESCENT FIXTURES
	DUPLEX CONVENIENCE OUTLET
WP	WEATHERPROOF OUTLET
	SPECIAL OUTLET
"A"	FIXTURE MARK
N.L.	NIGHT LIGHT CIRCUIT, SW. & PANEL
P-1	HOME RUN TO PANEL & CIRCUIT NO.

RISER DIAGRAM - NO SCALE





MECHANICAL AND ELECTRICAL PLAN

SCALE: 1/4" = 1'-0"

NOTE: WRAP ALL PLUMBING PIPES WITH AUTOMATIC HEAT TAPE, EZ-AIR SERIES - EASY HEAT CO. AS CALLED FOR IN SPECS.

REVISED APRIL 29, 1971

PROJECT	OWNER	ARCHITECT	JOB NO. 0463 DATE 6-17-69
RENOVATIONS TO VETERANS PARK SHELTER ANN ARBOR, MICHIGAN	CITY of ANN ARBOR	JAMES P. WOLIG & ASSOC. 1578 E. STADIUM BLVD. ANN ARBOR, MICHIGAN	7

GENERAL CONDITIONS (SUPPLEMENTARY)

1. Scope:

   A. The Contractor shall provide all items, articles, operations or methods listed, mentioned or scheduled on the drawings and/or herein, including all labor, materials, equipment and incidentals necessary and required for their completion.

2. General Conditions:

   A. The "General Conditions" of the Contract for the Construction of Buildings standard form, American Institute of Architects, current edition, shall form a part of these specifications, applying to the Contractor and all Subcontractors.

   B. A copy is available for reference at the office of the Architect.

3. Allowances:

   A. See trade divisions for sums to be set aside for materials and/or labor not specifically described. Allowances include:

      a. Brick, see Masonry - $73.00 /M
      b. Finish Hardware, See Carpentry and Millwork - $450.00

   B. Any difference between the Allowances and final costs to be adjusted between Owner and Contractor.

4. Laying Out Work:

   A. The Contractor shall be responsible for correctly laying out the work as shown on the drawings, and maintaining accuracy in the work through out.

   B. As the work progresses, the Contractor shall lay out and mark all partitions as a guide to all trades.

5. Manufacturer's Specifications:

   A. Wherever materials or products are specified by trade name the Manufacturer's Specifications shall be strictly followed. No substitution allowed without approval of the Architect.

6. Protection:

   A. General:

      a. Erect safe and proper barricades as necessary to prevent personal injury.

   B. Weather:

      a. Provide suitable protection for all work and materials to prevent any weather damage.
      b. At the end of a day's work, cover all new work likely to be damaged.
      c. Provide a temporary storage shed on the premises for the use of all trades.

7. Temporary Utilities:

   A. The General Contractor will provide all electric, lighting, and other utilities for all trades. Water will be supplied to building area by city at no cost to Contractor.

8. Insurance:

   A. Contractor:

      a. The Contractor shall maintain Workmen's Compensation, Public Liability, and Property Damage insurance through out the term of this contract, all in accordance with the laws of the State of Michigan. The limits of insurance required are:

         Public Liability $100,000 for injury to one person and
         $300,000 for one accident
         $ 50,000 for damage to property

9. Toilet Accomodations:

   A. General Contractor shall provide and maintain temporary facilities for the workmen. Installation is to meet all governing codes.

EXCAVATION, BACKFILL & GRADING

1. General Conditions:

   A. The work under this section is subject to the General Conditions (Supplementary) items 1 thru 9.

2. General Notes

   A. General Contractor will stake out the building and establish floor and grade elevations.

3. Excavation:

   A. Remove topsoil from the building area and pile it for redistribution.

   B. Excavate to dimensions and elevations indicated, plus sufficient space to permit erection of forms. Use all material on the site.

   C. The Contractor shall notify Architect before placing of concrete, of any unusual soil conditions which might prevent footings and piers from being poured on solid bearing.

4. Filling and Grading:

   A. Fill:

      a. Fill under all concrete slabs, interior and exterior, with 6" minimum sand-gravel, run-of-pit.

   B. Backfill:

      a. Backfill foundation wall trenches with sand-gravel, run-of-pit. Compact all fill with water and tamping.

   C. Grading:

      a. Cut or fill to bring grades to approximately those shown on drawings.

      b. Placement of topsoil and finish hand grading is not a part of this contract.

CONCRETE

1. General Conditions:

   A. The work under this section is subject to the General Conditions (Supplementary) items 1 thru 9.

2. Footings and Piers:

   A. Footing trenches and piers:

      a. Cut with straight sides, if possible, and remove all loose earth.

   B. Forms:

      a. Lined up. Level and centered under walls.

   C. Reinforcing:

      a. This Contractor to furnish and install all reinforcing bars.
      b. See foundation plan and sections.

   D. Placing concrete:

      a. Per requirement of Local Code. Use 3000# concrete.
      b. Rough screed top in preparation for placement of block walls.

   E. Anchors:

      a. Note anchor rods to be installed in concrete piers.

3. Floors:

   A. Interior:

      a. Note concrete floor is placed over 6" minimum sand-gravel fill. Settle with water.
      b. Vapor barrier required - 4 mil Visqueen film vapor barrier over sand fill in all interior rooms.
      c. Reinforce with 6 x 6 #10 ga. welded wire mesh.
      d. Place 4" slab. Steel trowel floors to smooth surface suitable for finish floor, pitched 1" to drains.
      e. Use 3000# concrete through out.
      f. Use Demicon Cure-Hard Liquid hardener.

   B. Exterior:

      a. Note slabs are placed over 6" minimum sand-gravel fill, settled with water.
      b. See plans for expansion joints. Include joint between all parts of the structure and the slabs. Use 1/2" x 4" asphalt impregnated material such as Flexcell, by Celotex Corporation.
      c. Reinforce with 6 x 6 #10 gauge welded wire fabric, lapped 6" and pulled up into slab. (Do not run through expansion or cold joints).
      d. Place 4" slab and trowel to smooth surface.
      e. Cross-brush with fine hair broom.
      f. Edge all slabs and joints with small radius tool.
      g. Pitch as shown. Note slab is thickened to 12" on entire perimeter.
      h. Use minimum 3000# air entrained concrete.
      i. Place metal inserts and bench supports as shown.

MASONRY

1. General Conditions:

   A. The work under this section is subject to the General Conditions. (Supplementary) items 1 thru 9.

2. Block Walls:

   A. Materials:

      a. Block, lightweight aggregate.
      b. Mortar, use one part commercial mortar cement to three parts sand by volume. Brixment preferred.
      c. Reinforcing, "Dur-O-Wal", every third course.
      d. Galvanized brick anchors.

   B. Laying:

      a. Full beds of mortar.
      b. Plumb, level, true to line, 8" per course, running bond.
      c. Tool all exposed joints half round, strike others flush.
      d. Fill core of block work of all exterior walls with water repellant Vermiculite insulation.

   C. Cleaning:

      a. Cut out loose mortar, fill all holes, repoint where necessary.
      b. Exposed masonry surfaces left clean of mortar lumps and stains.

3. Brick Walls & Piers

   A. Material:

      a. Brick allowance, $73.00/M.
      b. Mortar, dark color, Architect to select color.

   B. Laying:

      a. Full beds of mortar, running bond, parge block back-up.
      b. Plumb, level, true to line.
      c. All exposed joints to be raked.
      d. Provide cement wash and grout into place steel anchors for all wood beams at top of all brick piers. Note angle supports for wood benches.

   C. Cleaning:

      a. Cut out loose mortar, fill all holes, repoint where necessary.
      b. Scrub with 5% solution of muriatic acid.
      c. Flush with clear water.

4. Fireplace - Alternate #1

   A. Fireplace:

      a. Build per details on sheet 5, and the plan on sheet 3.
      b. Damper, cast-iron, chain control.
      c. Flue lining, terra cotta, free from cracks.
      d. Fire brick, laid flat, backwall and sidewalls.
      e. Hearth, reinforced concrete, on steel frame . Smooth trowel finish top and exposed edges.
      f. Depressed 1" firebrick under fire.
      g. Chimney cap of cement with wash. Waterproof with two coats "Theroseal".
      h. Base and cap flashing by others.

5. Insulation:

   A. Perimeter of foundation walls:

      a. Furnished and installed by General Contractor.

   B. Block walls:

      a. Masonry Contractor to fill block cavity with water repellent Vermiculite masonry fill insulation by Zonolite Company.

6. Planter Boxes - Alternate IV

   A. Planter box:

      a. Build per detail on Sheet # 3.
      b. Asphalt waterproof interior.

STRUCTURAL STEEL & MISCELLANEOUS METALS

1. General Conditions:

   A. The work under this section is subject to the General Conditions. (Supplementary) items 1 thru 9.

2. Lintels:

   A. Furnish all steel lintels of built up sections and angles as shown in details. Built up lintel over garage door shall have minimum bearing of 8" each side. Masons will install.

3. Wood Beam Anchors

   A. Furnish bent plate anchors as detailed on Sheet # 5 to masons to locate and set. This Contractor shall weld anchoring rod to plate after anchors are set in grout.

4. Wood Bench Supports & Inserts Built In Concrete

   A. Furnish to Masonry and Concrete Contractors steel angle and pipe bench supports; pipe insert at sill of garage door in proper time for them to install.

5. Fabrication:

   A. Do all punching and drilling of steel required for attachment of other materials.

   B. All shop connections shall be welded.

6. Painting:

   A. All structural steel and miscellaneous metals shall receive one shop coat of metal primer after all dirt, rust and scale have been removed.

CARPENTRY & MILLWORK

1. General Conditions:

   A. The work under this section is subject to the General Conditions. (Supplementary) items 1 thru 9.

2. Work Included:

   A. In general the Carpentry and Millwork will include: roof trusses with shaped panels, roof decking, wood beams, ceiling joist, plates, wood ceiling, cement asbestos board ceiling, doors, counter and shelving, wood fascia and trim, wood louvers, wood benches and any and all miscellaneous items not mentioned herein but shown on drawings or necessary for a completed installation.

   B. Trusses:

      a. As fabricated by Michigan Timber and Truss.
      b. Shop drawings shall be submitted to Architect showing all connections, lumber grades and details for approval.

   C. Beams & Joists:

      a. Beams shall be No. 2 fir or better selected for straightness.
      b. Roof and ceiling joist shall be No. 1 fir.

   D. Roof Sheathing:

      a. Shall be shiplap T.F. not over 8" wide where concealed by ceiling. At exposed underside (approximately 4' outside of brick piers) roof sheathing shall be 1" x 6" "V" joint redwood.

   E. Shaped Panels:

      a. Shall be No. 2 fir or better cut from 2" x 12" and spiked to top chord of truss. Note detail on Structural Sheet.

   F. Studs & Plates:

      a. Shall be No. 2 fir or better.
      b. Stud partition shall be 16" o.c. with 1/2" U.C. fir plywood screwed to both sides of studs for possible removal.
      c. Plates shall be 2 x 8 bolted 4' o.c. to masonry walls. Bottom chord of trusses bearing on plate shall be toenailed to plate for added stability of roof.

   G. Finish Ceilings:

      a. 1 x 6 "V" joint redwood nailed to joist and bottom chord of truss in open shelter areas.
      b. 1/4" cement asbestos panels in all enclosed areas. Chipped edges of panels will not be accepted. Provide 5/4" x 5/4" redwood moulding at top of walls to cover plates.

   H. Benches:

      a. Shall be clear, all heart redwood as shown. Seal with one coat of "Woodlife" before assembly.

   I. Doors:

      a. Sizes as shown in Door Schedule with solid core, paint grade birch veneer and exterior glue.
      b. Overhead doors shall be by "Crawford" or "Overhead" of 4 panel flush designs, 1/8" hardboard panels both sides, exterior glue, complete with track and all hardware and weatherstripping.

REVISED APRIL 23, 1971

PROJECT	OWNER	ARCHITECT	JOB NO. 6905 DATE 4-19-65
RENOVATIONS TO VETERANS PARK SHELTER ANN ARBOR, MICHIGAN	CITY of ANN ARBOR	JAMES P. WONG & ASSOC. 2378 E. STADIUM BLVD. ANN ARBOR, MICHIGAN	8

2. Work Included: - continued

J. Fascia, Louvers & Trim:

a. Shall be clear all heart redwood.
b. Fascia board at joints shall be scarfed or shiplap. No butt joints will be accepted.
c. Screening shall be 18-1h aluminum screen cloth.

K. Counter Top & Shelves:

a. Counter top shall be 3/h" mahogany plywood. Metal cladding at pass thru window will be by others.
b. All shelving and dividers shall be 3/h" fir A-B plywood.

L. Access Panel:

a. Provide a 2h" x 36" access panel of 1/2" plywood with a cased opening of 1 x 2 in Tractor Room where shown. Hang with aluminum piano hinge.

M. Hardware (Finish):

a. Furnish and install all necessary hardware. Hardware allowance of $150.00.

N. Removable Panels - Alternate III:

a. Seven are required on west elevation and six on east elevation.
b. 2 built up head beams and 2 continuous channel anchors as detailed are required under this alternate.
c. Panels shall be 3/8" redwood rusticwood plywood panel by (Simpson) exterior glued to 3/h" V.G. fir plywood good one side,
d. Each panel shall have a glazed spanel of 1/h" clear, colorless "Plexiglass" as detailed with redwood jambs and stops. Allow 1/8" minimum on all sides of plexiglass for expansion.
e. Bent plate head clasps and bottom holding bolts as detailed.
f. 3 coats of pigment stain for beams and panels and one coat metal primer and 2 coats metal paint on metal included under this Alternate.

O. Insulation:

a. Ceiling of enclosed areas: Fiberglass 6" thick by 2h" bats foiled faced furnished and installed by this Contractor.

ROOFING AND SHEETMETAL

1. General Conditions:

A. The work under this section is subject to the General Conditions. (Supplementary) items 1 thru 9.

2. Work Included:

A. In general the work under this section shall include: metal flashing, saddles, asphalt shingle roof, roof edging and metal counter top.

B. Flashing of plumbing vents will be by others.

3. Asphalt Shingles:

A. Shall be Wind Seal Shingles by "Bird". Weight shall be 235# per square. Color to be Moire Black. Shingles shall be laid 5" to weather in accordance with manufacturers instructions.

B. Underlayment, one layer of 15# asphalt saturated felt applied "shingle fashion" with 6" minimum end laps and h" minimum edge laps. Cap all ridges with full width strips and ridge shingles.

C. Roofing nails shall not penetrate roof sheathing where underside is exposed.

h. Flashing & Metal Edging:

A. Shall be 16 oz. cold rolled copper.

B. Metal edging shall be required on all roof edges including gable end. No butt joints will be permitted. Edging shall have 1/2" bottom lock and joints shall be lapped 3" and bottom locked.

C. Flashing at chimney shall be base and counter or cap.

5. Metal Counter Top:

A. Shall be 20 ga. stainless steel formed to top furnished by Carpentry Contractor. Stainless steel shall cover the edges and lap the bottom a minimum of 1". All corners shall be soldered and ground smooth.

6. Exhaust Fan & Ducts:

A. Note location of fan and grilles in ceiling of toilet rooms. Fan will be mounted on rubber or felt mounts in attic space and discharge directly into attic space.

B. Duct work shall be 26 ga. galvanized iron from each register or grille as shown and terminate at a common plenum connection of fan.

C. Fan shall be ILG Electric Ventilating Company small type B Util-A-Set No. 89 - 1725 RPM, 1/12 H.P.

D. Ceiling grilles shall be by A & A Register Company. No. A-05, Size 6" x 1h" in each toilet room.

E. Electrical Contractor will make all electrical connections and wiring.

HOLLOW METAL DOOR FRAMES

1. General Conditions:

A. The work under this section is subject to the General Conditions. (Supplementary) items 1 thru 9.

2. Frames:

A. Frames shall be 16 gauge cold rolled steel with 3 anchors per jamb and floor anchor clips. Frames are to be mortised and reinforced for strikes and hinges.

B. All frames shall be shop primed both sides with a rust inhibitant paint.

METAL TOILET PARTITIONS

1. General Conditions

A. The work under this section is subject to the General Conditions. (Supplementary) items 1 thru 9.

2. Partitions:

A. Toilet partitions shall be Mills "Marblestal: floor braced or approved equal: color to be Sage Green #H-722. Partitions, doors, hardware and installation to meet manufacturers standard specification.

B. Sizes shall be 36" x 57".

C. All exposed surfaces other than hardware and trim shall have one coat of baked on primer and two coats of baked on enamel.

D. Each compartment shall have a paper holder, slide latch, keeper and bumper and combination coat hook and bumper of manufacturers standard design.

E. Erect compartment rigid, straight, plumb and level. Secure to wall with two stirrups near top and bottom and bolt to wall. Secure to floor with 3/8" cadmium plated bolts set in expansion shields, extending at least 2" into concrete.

ASPHALT PAVING BLOCKS - ALTERNATE II

1. General Conditions:

A. The work under this section is subject to the General Conditions. (Supplementary) items 1 thru 9.

2. Paving Blocks:

A. Hexagonal asphalt blocks shall be as manufactured by the Hastings Pavement Company (Russ Brown and Associates, 18230 Grand River Ave., Detroit, Telephone Number BE. 3-6960).

B. Blocks shall be 1½" thick and 8½" between parallel sides composed of crushed limestone and asphaltic cement binder.

C. Blocks shall be laid in tight joints on a bed of ½" well tamped and rolled stone approximately 3/h" to 1½" in size; then 2" of finely graded sand-stone to fill voids between large stone. Over this base spread a 1" underlayment of six parts sand to one part cement.

D. Blocks shall be laid in straight courses end to end; each row begun with half or full blocks alternately. Surface is sealed by sweeping equal portions of dry sand. Cement into joints.

E. Detailed installation instructions will be furnished by manufacturer.

PAINTING AND CAULKING

1. General Conditions:

A. The work under this section is subject to the General Conditions. (Supplementary) items 1 thru 9.

2. Caulking:

A. Caulk all joints around door frames and any other locations shown or required to make all exterior work weather tight.

B. Caulking shall be Tremco Caulking and Painting Compound or approved equal. Color to match adjoining material.

3. Painting:

A. Preparation of surfaces include cleaning off all dirt, filling all nail holes and in general preparing a clean smooth surface to receive paint or stain.

B. Exterior Work:

a. Wood beams, fascia board, louvers, trim; 3 coats of pigmented oil stain. Color to be selected.
b. Wood doors, one coat of exterior wood primer and two coats of exterior oil paint. Painting of top and bottom of doors included.
c. Redwood soffit, two coats of pigmented stain.
d. Ferrous metal including all anchors, door frames, bench supports, steel lintels shall have two coats exterior metal paint not including shop primer coat.
e. Aluminum light fixture frames; metal primer and one coat exterior metal paint sprayed on.

C. Interior Work:

a. Cement asbestos ceilings; two coats of semi-gloss enamel.
b. Wood plate or molding; two coats of pigmented stain.
c. All block walls except Toilet Rooms; two coats "Crete Masonry Paint".
d. Plywood partition; one coat of sealer, two coats enamel.
e. Counter and shelving; one coat sealer and two coats of semi-gloss enamel.
f. Toilet Room block walls:

1. "Terazzo-Wall" by Arvem, epoxi-glazed (3 coats)
2. "Situflex" by H. L. Blackford, Inc.
3. "Texolite" by U.S. Gypsum Company (3 coats)

D. Protection of Work:

A. Protect concrete floor with drop clothes and remove all paint drippings.

PLUMBING

1. General Conditions:

A. The work under this section is subject to the General Conditions (Supplementary) items 1 thru 9.

2. General Notes:

A. All work to conform to Local and State Codes.

B. Sewer and water benefit charges under sewer ordinance #51 and water ordinance #h3 are included in the bid.

REVISED APRIL 23, 1971

PROJECT	OWNER	ARCHITECT	Job No. 7006 DATE 6-21-70
RENOVATIONS TO VETERANS PARK SHELTER ANN ARBOR, MICHIGAN	CITY of ANN ARBOR	JAMES P. WONG & ASSOC. 1973 E. STADIUM BLVD. ANN ARBOR, MICHIGAN	9

3. Soil, Waste and Vent Lines:

A. Building Sewer:

a. Main and branch waste and vent lines, cast-iron below concrete floor, may be galvanised steel pipe or Type L hard copper above at contractor's option.
b. Sewer, 4" cast-iron to point 10' outside north wall of building. Vitrified clay pipe and fittings from this point to existing sanitary (including new man hole as per Ann Arbor standards) see Sheet #1.

B. Flashing of vent lines thru roof: (2)

a. Lead or copper roof jack furnished by this Contractor (not hammer - ring type).
b. Roofing Contractor will build into shingles.

4. Drains:

A. Footing Drains: - None

B. Floor Drains: (3)

a. Toilet rooms and concession, 3" cast-iron body, polished nickle bronze adjustable strainer, set 1" below finish floor.
b. Utility room, 3" cast-iron body, cast-iron strainer, set 1½" below finish floor. Tractor Room same as Utility Room.

5. Water Supply Pipes and Fittings:

A. Meter and service:

a. Run 1¼" Type K copper service line from point shown on foundation plan west of building to meter location on south wall of Tractor Room. Cap end of water line outside building temporarily.
b. Notify Owner to apply for 3/4" x 1" meter.
c. Owner to provide water to cap end of water line.
d. Alternate V - 1½" copper water line from 10 ft. west of Shelter to property line at Maple Road and cap.

B. Piping:

a. All inside water supply piping to by Type L hard copper, streamlined fittings, sweat solder type, when above concrete floors. Use Type K soft copper below concrete floors, 95-5 joints (avoid joints if possible).
b. Size supplied according to Local and State Codes.
c. Provide air chambers of sufficient capacity at all faucets to prevent knocking, and solder hangers to pipe, provide rubber gaskets etc., to prevent noise from pipe movement.

C. Shut-Off Valves:

a. Provide for all fixtures.
b. Provide for two outside sillcocks, Zurn Z-1335, 3/4" bronze casing.

6. Insulation:

A. Insulate all cold water pipe above concrete floors with cellular asbestos to avoid sweating.

B. Keep hot and cold water lines to a minimum of 6" apart.

C. Electric Contractor to provide and install heat tape on underground piping from exterior wall of Men's toilet to and including all lines in concession.

7. Fixtures and Fittings:

A. Fittings:

a. Sillcock, solid brass or bronze.
b. Concession and toilets, chrome plated brass.
c. Utility room, solid brass or rough C.P.

B. Fixtures: Furnish and install the following White fixtures, Crane Mfg. Co.

a. Lavatories - Wall hung Crane 20 x 18 in. Yorkshire complete with P. O. Plug, with No. 333 Chicago push button basin faucet and Z-122h Zurn concealed type hanger.
b. Water Closets - Crane Rapidway #3-460 vitreous china elongated closet bowl, with #1h3YV Sloan flush valve, 1" W. H. straight stop, OV-100A vacuum breaker, church seat #395 and #3-988 supporting chair.
c. Urinals - Crane Sanitor #7-43 stall type No. 4 Bellesmade #7-470 china tanks, Marvel #9-896 float valve and #9-890 siphon valve. Tanks in Utility Room.
d. Service Sink - Crane #7-563, size 24" x 20" with #7-626 enamel inside trap for 3" pipe connection, #8-100 faucet, and 8-980 rim guard C.P.
e. Drinking Fountain - Haws Model 7J, wallhung, frost-proof valve, 36" to top of nozzle.

ELECTRICAL

1. General Conditions:

A. The work under this section is subject to the General Conditions (Supplementary) items 1 thru 9.

2. Codes:

A. Comply with all governing laws applying to electrical installations and with wiring rules of local electric utility company.

B. Obtain all permits required by local ordinances. After completion of work, secure certificate of final inspection and approval.

3. Main Service:

A. Provide 200 amp 3/P S/N switch on west wall of Switch Room in transformer building. Connect to existing 2½" x 3" bus bars with lugs and bolts to phases with smallest load. Check phase load before connection.

4. Utility Service:

A. Run Service overhead to outside of transformer building wall and down in conduit to 6" x 6" x 16" pull box 2' off grade. Conduit shall extend 18" below grade.

B. Install 3 - #3/0 RH direct burial cable in a trench 30" deep and cover with sand and "Zimco" or creosoted plank.

C. Service shall terminate at a 200 amp safety switch in Utility Room fused at 150 amp.

D. Light panel shall be Square "D" QO load center for 1 p., 3 wire 120 - 240 V with 150 A main and 10- 1/p 20 amp breakers, 6- 2/p 20 amp breakers and 4 - 2/p 20 amp spaces, or approved equal.

5. Wiring:

A. Conceal all wiring and outlet boxes, except in utility room.

B. Use Romex type wiring inside the building, of following sizes:
a. All wall and ceiling light outlets, #12.
b. Convenience outlets, #12.
c. Electric heating panels, #12.
d. Conduit where required.

6. General Purpose Circuits:

A. Provide 20 amp branch circuits to supply all lighting outlets and all convenience outlets throughout.

7. Appliance circuits:

A. Provide 20 ampere branch circuit to supply hot water heater.

B. Hot water heater shall be No. 212 glass lined automatic electric hot water heater by Payne Products Co., Ann Arbor.

8. Individual Equipment:

A. Provide branch circuits for each of the following, and connect ready for operation:
a. Toilet room exhaust fan and lights. Unit furnished and installed by sheet metal contractor.
b. Electric space heating equipment - This contractor to provide and install the following:
General Electric Co. Radiant Ceiling Panel, No. GE-72h2-2, 700W, 240V complete with frame, heating element assembly and face plate. Two such units are required in the girl's toilet, two in the boy's toilet and three in the concession. Mount units flush with ceiling in locations shown on plan. Mount automatic thermostats HWC11 at 5' heights where shown on plans.
c. Electric convection Heater GE 7257-5, 240V, 4500W with HWC11 automatic thermostat in Tractor Storage Room.
d. Electric convection Heater GE 7255-2, 240V, 2000W with HWC11 automatic thermostat in Utility Room.

9. Fixtures:

A. See list of fixtures on Sheet 7.
a. Include all fixtures listed in the bid.
b. Install all fixtures, complete.
c. Inform Owner to obtain supply of bulbs as shown on plans from the Detroit Edison Company and install.
d. Face plate of fixture "A" will be painted by others.

10. Outlets:

A. All outlets shall be located as shown.

B. Materials as follows:
a. Switches, 20 amp specification grade "T" rating.
b. Outside plugs, Arrow-Hart grounding type, WP, installed with tamper proof screws.
c. Plugs, duplex brown bakelite, grounding type outlet, Bryant.
d. Plates for all outlets, switch and convenience, stainless steel, plain satin finish, Bryant. Note tamper proof screws will be required on all plates. Spanner head type is recommended.

11. Heat Tape:

A. Provide and install automatic heat tape with thermostat, EL-AB series by Easy Heat Company, on underground piping from exterior wall of men's toilet to and including all lines in concession.

REVISED APRIL 23, 1971

PROJECT	OWNER	ARCHITECT	JOB NO. 0169 DATE 04/7/69
RENOVATIONS TO VETERANS PARK SHELTER ANN ARBOR, MICHIGAN	CITY OF ANN ARBOR	JAMES P. WONG & ASSOC. 1014 E. STADIUM BLVD. ANN ARBOR, MICHIGAN	10

APPENDIX C

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

555 Hulet Drive
Bloomfield Hills, MI 48302-0360

248-454-6300

www.hrcengr.com

Memorandum

To: Adam Fercho, Park Planner & Landscape Architect, City of Ann Arbor

From: Hubbell, Roth & Clark, Inc.
Jim Yates, Ph.D., P.E., *Senior Project Engineer*
& Adrianna Melchior, AIA, LEED AP, *Associate*

Date: July 26, 2023

Subject: Farmer's Market Building: CMU Investigation HRC Job No. 20230292.02

General:

As requested by the City of Ann Arbor Parks and Recreation Department, Hubbell, Roth & Clark, Inc. (HRC) has performed two site investigations to review conditions at the existing Farmer's Market Building located at 315 Detroit Street. The City was concerned because of observed settlement of the perimeter sidewalk adjacent to the building, masonry cracks that have developed, and the apparent lack of support of the northwest corner wing wall. The City is aware the perimeter sidewalk needs to be replaced to an ADA compliant condition and wants to repair the cracked masonry units (CMU) but also wants to address the underlying cause of both the sidewalk settlement and the masonry cracks.

The building was constructed in 1984 – here is a photo from the Ann Arbor News archive from May 1984 when it opened (the settlement in question is at the north wall which is at the right edge of the photo):

Building Construction:

The Farmer's Market Building walls appear to be load bearing masonry construction, with brick masonry units starting at 40" above the floor elevation and extending to the roof line, and split face masonry units with two 4" accent bands of matte glazed CMU below the brick. It is not known if the walls are reinforced, but none was observed, and original construction documents could not be located. The bottom of the split face masonry units is roughly at the sidewalk elevation. Below the split face units (below grade) are three courses (24" high total) of plain CMU that were ungrouted. At the underside of this CMU is a cast-in-place concrete footing extending to approximately 5' below the sidewalk elevation. The footing is 3"-4" wider than the masonry wall along the north elevation.

Investigations:

HRC performed an initial investigation on June 22, 2023, to review existing conditions. HRC (Adrianna Melchior and Jim Yates) met with the City (Scott Spooner) to review the wall cracks/voids and witness the televising of the storm drain lines below the building, as performed by the City's DPW staff.

- The existing perimeter sidewalks on the east, north and west sides have experienced various amounts of settlement and are not ADA compliant except for directly in front of the east and west side building doors that are likely supported by frost footings and do not appear to have settled at all.
- No cracks were observed at the brick masonry units or their respective grout joints.
- Numerous cracks were noted in the split face CMU units and the 4" CMU accent bands, as well as cracks in the grout joints for these units.
- In the four building corners, the downspouts from the gutters connect to PVC drainpipe. It was thought that if the drainpipe was discontinuous or broken below ground, this could be responsible for the sidewalk settlement and CMU cracking. HRC suggested the drainpipes be video investigated to determine if there were any breaks of open joints that could allow soil material to wash in.
- HRC witnessed a City crew put a video camera down the drainpipe lines in the northeast and northwest corners out to the catch basin in the parking lot to the north of the building. The pipes were observed to be in particularly good condition, with tight joints, no cracks and no sign of earth infiltration or root intrusion. This eliminated the storm lines as a source of the settlement.

A second investigation was performed on July 17, 2023, to review the excavation of the north side foundation walls, also performed by DPW staff. HRC (Jim Yates) met with the City (Jason Nealis) to witness the exposing of the northwest corner below grade building and foundation wall.

- In discussions with City personnel, there was a theory proposed that *if* the building had perimeter foundation drain tile lines that connect to the sanitary sewer, soil material may be washed away through the joints of the tile, which could be causing the settlement issues. HRC suggested the sidewalk be removed in the northwest corner and the foundation exposed to see if there was a perimeter drain tile and to investigate the condition of the CMU foundation wall below the split face CMU courses as well as to observe the construction and condition of the concrete foundations.
- Prior to the excavation, at the northeast and northwest corner wing walls (short sections of wall that project past the face of the rest of the main north wall), the CMU appeared to be cantilevered out over the main wall foundation, as no foundation wall was visible below grade and nothing solid could be detected by poking a short probe into the dirt.
- During the 2nd investigation, HRC observed the City crew excavating the north foundation wall at the western corner. Just prior to this visit, City personnel had removed the existing sidewalk in both directions in the northwest corner. During investigations, it was found that the northwest corner wing wall is now missing its CMU wall footing (which it did have at one time) and is completely unsupported. This short section of wall was only supported by the wall it connects to above grade and the soil below.
- At the west corner of the north wall, the three courses of plain CMU above the concrete foundation were either missing or disintegrating. The condition improved toward the east in a stepped fashion and at approximately 48" from the corner the majority of the below grade CMU was intact with only the uppermost face shell having a hole. The hollow cores of the lower courses were filled with soil material and broken pieces of CMU.
- On the north wall, the excavation exposed the concrete foundation below the plain CMU so the condition, width and depth could be verified. The concrete foundation appeared sound, was 3"-4" wider than the CMU to the north and extended to approximately 5' below the sidewalk/floor elevation.
- As the excavation process continued around the corner to the west side, excavations were halted when it was noted that the northwest corner wing wall was actively sagging off the building. A horizontal crack opened up between the top of the split face and the bottom of the brick masonry and vertical cracks opened approximately 3' in each direction

from the corner. At this point, a manual hydraulic jack and piece of 4x4 timber were placed on the existing concrete foundation to stabilize the wing wall and raise it back into position, tight to the underside of the brick masonry.

Analysis and Recommendations:

- The underlying cause of the CMU distress is long term heavy salt use in the winter for safety. Chlorides in salt can speed up the rate of concrete deterioration and decrease its overall durability. The salt water from the melting ice and snow infiltrates the joint between the sidewalk and building wall, around the roof downspout drains and accumulates against the corner wing walls. Eventually the CMU face shell deteriorated to the point of a hole forming, which allows soil material to wash into the voids of the ungrouted cores of the masonry over time and causes the sidewalk to settle. Over time, the deterioration of the foundation wall units has accelerated and become more pronounced, leading to cracks forming in the split face CMU above as the supporting units below become progressively worse.
- HRC recommends a comprehensive foundation wall rehabilitation and repair be undertaken along with reconstruction of the perimeter sidewalks to an ADA compliant condition. Around the entire building perimeter, the face shells of the below grade plain CMU units (under the split face) would be opened so the sub-grade wall can be grouted solid, eliminating the voids. Admixtures can be added to the grout to improve the performance against chloride effects. In the northwest and northeast corners, the plain CMU units will have to be replaced as some are badly damaged and some are completely missing. New replacement CMU will be specified with an integral water repellant, and mortar and grout will be specified with the appropriate admixtures to enhance the long-term performance. New sidewalk details will be developed to promote drainage away from the building as opposed to parallel to it, with a more robust joint between the building and walk. Steps will also be taken to prevent downward infiltration at the downspout piping and to prevent accumulation of water at the protruding wings.
- Rehabilitation work would be accomplished in stages, working along the façade in approximately 4' sections to remove and replace CMU in order to minimize further damage to the building and prevent the need for extreme shoring.
- The concrete foundations all appeared to still be intact, so these should be able to remain as-is during the reconstruction efforts.

Temporary Supports and Shoring:

- In order to temporarily stabilize the condition at the northwest corner of the building, HRC instructed City staff to install solid concrete block (manhole units) between the top of the existing concrete footing and the underside of the split face CMU below the wing wall and shim these blocks in tight so the hydraulic jack and 4x4 beam can be removed.
- HRC also instructed City staff to backfill the hole with 21AA gravel.
- Once these two repairs have been implemented, the City can replace the area of missing sidewalk and reopen the facility to the public as the next steps in the repair and rehabilitation are contemplated, proposed, and approved. It should be noted that this is a temporary fix and that a full repair of the CMU (both below grade and above grade) will be needed in order to fully resolve the issues.
- The northeast wing wall did not appear to be as distressed as the northwest corner, so if the restoration recommendations are implemented within the next year, it should be able to remain as is for the time being with careful monitoring. If it is anticipated the repairs will take place farther down the road in the future, the northeast corner should also be excavated, and solid block placed under the wing to stabilize it for a longer period. Care should also be taken over the winter to carefully clear sidewalks and minimize salt use to only what is necessary to maintain safe conditions.

Photos of Significance:

Photo 1: North Foundation Wall Missing CMU Elements

Photo 2: North Foundation Wall CMU Cores with Debris

Photo 3: North Wing Wall 3 Courses of CMU Missing

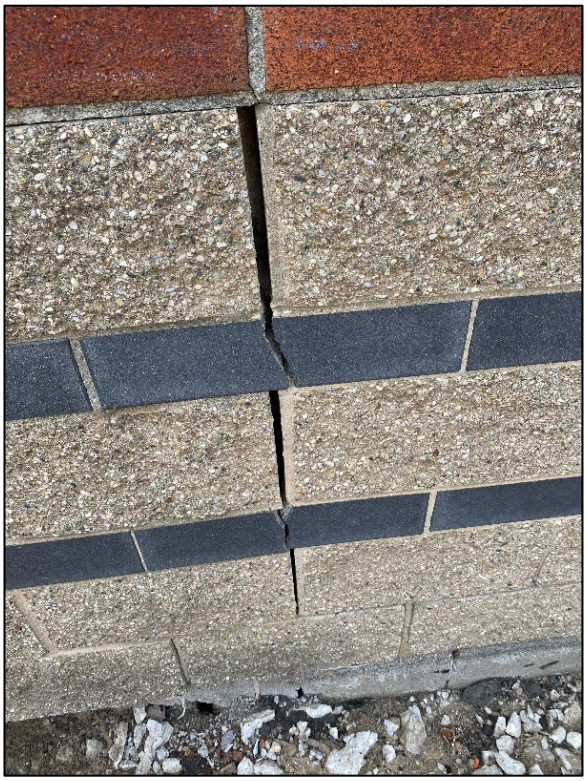


Photo 4: West Wall Crack Through Units

Photo 5: Northwest Wing Wall Crack (Widening During Excavations)

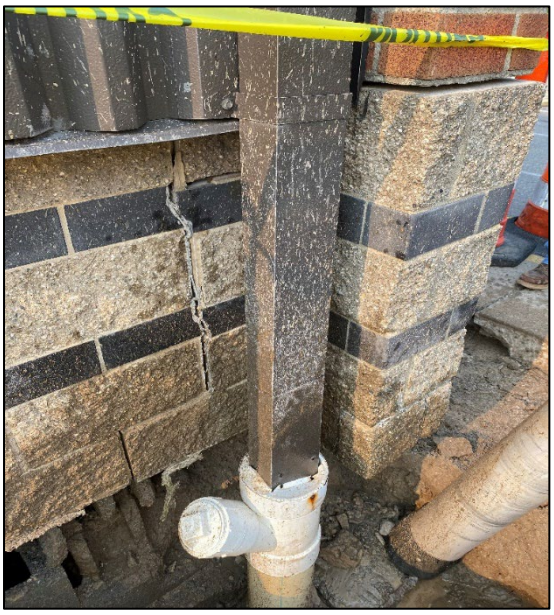


Photo 6: North Wall and Northwest Wing Wall Cracks

Photo 7: West Wing Foundation Wall with Missing CMU Units

Photo 8: West Wall Cracks

Photo 9: Concrete Foundation Below Plain CMU

Photo 10: Hydraulic Jack and 4x4 On Concrete Foundation

Photo 11: West Foundation Wall Disintegrating CMU

Photo 12: Sidewalk Removal Area.

415 W. WASHINGTON REFERENCE DRAWINGS - APPENDIX D

LEGEND

- PROPERTY LINE
- RIGHT-OF-WAY
- EASEMENT
- EXISTING CURB AND GUTTER
- OHE — OVERHEAD UTILITY LINE
- E — UNDERGROUND ELECTRIC LINE
- G — UNDERGROUND GAS LINE
- W — UNDERGROUND WATER LINE
- UNDERGROUND STORM LINE
- UNDERGROUND SANITARY LINE
- X — EXISTING FENCE
- BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- EXISTING CONTOUR
- EXISTING BUILDING
- FLOODWAY AE
- FLOOD ZONE AE
- FLOOD ZONE X (0.2%)

NOTE: SEE BELOW FOR INFORMATION ON FLOOD MAPPING.

SITE ANALYSIS

INFORMATION ON THIS PAGE IS FROM THE ALTA SURVEY DATED 10 / 21 / 2021 BY ATWELL GROUP, SEE SHEET 2 IN THIS SUBMITTAL PACKAGE.

SOIL DESCRIPTION

FoB: FOX SANDY LOAM, TILL PLAIN
FoC: FOX SANDY LOAM, HURON LOBE
MdA: MATHERTON SANDY LOAM

NATURAL FEATURES SUMMARY

1. **ENDANGERED SPECIES HABITAT -** THERE IS NO ENDANGERED SPECIES HABITAT ON THE SITE (PER SMITHGROUP 2022 FIELD OBSERVATION).
2. **FLOODWAY / FLOOD FRINGE -** THE SITE SHOWN IS LOCATED WITHIN ZONE X (AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN), ZONE X (AREAS OF 0.2% ANNUAL CHANCE FLOOD), ZONE AE (BASE FLOOD ELEVATIONS DETERMINED) AND FLOODWAY ZONE AE ACCORDING TO MAP NUMBER 26161C0243 OF THE FLOOD INSURANCE RATE MAP, EFFECTIVE DATE APRIL 3, 2012. PER FIRM MAP AND FLOOD INSURANCE STUDY REPORT, THE BASE FLOOD ELEVATION ACROSS THE SUBJECT PROPERTY RANGES FROM ELEVATION OF 803 TO 810 ON NAVD88 DATUM.
3. **LANDMARK TREES -** THERE ARE FOUR LANDMARK TREES ON THE SITE. SEE THE TREE TABLE BELOW AND LABELS ON THE PLANS. TREES 9507 AND 9509 ARE GROWING ALONG AN EXISTING RETAINING WALL THAT IS IN POOR CONDITION AND WILL BE REMOVED AND REPLACED. TREES 9536 AND 9549 WILL BE REMOVED IN ORDER TO BUILD A RETAINING WALL TO ACCOMMODATE THE SITE DRIVE THAT WILL PROVIDE VEHICULAR AND EMERGENCY ACCESS TO THE DEVELOPMENT. THE INTENT IS TO REPLACE THE TREES PER ORDINANCE REQUIREMENTS. EXACT LOCATION, SIZE, AND SPECIES WILL BE PROVIDED IN A FUTURE SITE PLAN SUBMITTAL.
4. **STEEP SLOPES -** THERE ARE NO NATURAL STEEP SLOPES ON SITE. EXISTING SLOPES THAT ARE STEEP ARE MAN-MADE AND INCLUDE RETAINING WALLS.
5. **WATERCOURSES -** THERE ARE NO SURFACE WATERCOURSES ON THE SITE AS IDENTIFIED ON ALTA LAND SURVEY. THE ALLEN CREEK DRAIN PASSES THROUGH THE SITE.
6. **WETLANDS -** THERE ARE NO WETLANDS ON THE SITE AS IDENTIFIED ON THE SURVEY.
7. **WOODLANDS -** THERE ARE NO WOODLANDS ON THE SITE AS IDENTIFIED ON THE SURVEY.

Tree Inventory Table - 415 W. Washington

Tree Tag #	Scientific Name	Common Name	DBH (Inches)	Landmark Tree
9525	*Acer negundo*	Boxelder Maple	6	
9503	*Acer negundo*	Boxelder Maple	6.5	
9517	*Acer negundo*	Boxelder Maple	6.5	
9533	*Acer negundo*	Boxelder Maple	6.5	
9516	*Acer negundo*	Boxelder Maple	7	
9531	*Acer negundo*	Boxelder Maple	7	
9532	*Acer negundo*	Boxelder Maple	7	
9545	*Acer negundo*	Boxelder Maple	7	
9521	*Acer negundo*	Boxelder Maple	8	
9526	*Acer negundo*	Boxelder Maple	8	
9527	*Acer negundo*	Boxelder Maple	8	
9539	*Acer negundo*	Boxelder Maple	8	
9502	*Acer negundo*	Boxelder Maple	8.5	
9522	*Acer negundo*	Boxelder Maple	9	
9518	*Acer negundo*	Boxelder Maple	9.5	
9529	*Acer negundo*	Boxelder Maple	10	
9547	*Acer negundo*	Boxelder Maple	10	
9528	*Acer negundo*	Boxelder Maple	11	
9530	*Acer negundo*	Boxelder Maple	11	
9537	*Acer negundo*	Boxelder Maple	12	
9548	*Acer negundo*	Boxelder Maple	12	
9510	*Acer negundo*	Boxelder Maple	14	
9549	*Acer negundo*	Boxelder Maple	19	Yes
9536	*Acer negundo*	Boxelder Maple	22	Yes
9546	*Acer rubrum*	Red Maple	6	
9520	*Acer rubrum*	Red Maple	8	
9544	*Acer rubrum*	Red Maple	8	
9519	*Acer rubrum*	Red Maple	9	
9541	*Ailanthus altissima*	Tree of Heaven	7.5	
9513	*Catalpa spp.*	Catalpa	12	
9514	*Catalpa spp.*	Catalpa	15	
9507	*Juglans nigra*	Black Walnut	28	Yes
9511	*Juglans nigra*	Black Walnut	12.5	
9512	*Juglans nigra*	Black Walnut	13.5	
9538	*Juglans nigra*	Black Walnut	14	
9542	*Juglans nigra*	Black Walnut	6.5	
N/A	*Malus spp.*	Apple	6	
N/A	*Malus spp.*	Apple	6	
N/A	*Malus spp.*	Apple	6.5	
9540	*Populus deltoides*	Eastern Cottonwood	7	
9523	*Robinia pseudoacacia*	Black Locust	9	
9524	*Robinia pseudoacacia*	Black Locust	12.5	
9508	*Tilia americana*	Basswood	9	
9509	*Tilia americana*	Basswood	27	Yes
9535	*Ulmus americana*	American Elm	12	
9543	*Ulmus americana*	American Elm	9	
9501	*Ulmus pumila*	Siberian Elm	18.5	
9504	*Ulmus pumila*	Siberian Elm	6	
9505	*Ulmus pumila*	Siberian Elm	12	
9506	*Ulmus pumila*	Siberian Elm	6	
9534	*Ulmus pumila*	Siberian Elm	13.5	

415 W. WASHINGTON DEVELOPMENT PUD

415 W. Washington St.
Ann Arbor, MI 48103

Owner:

CITY OF ANN ARBOR
301 E. Huron St.
Ann Arbor, MI 48104

SMITHGROUP

201 DEPOT STREET
SECOND FLOOR
ANN ARBOR, MI 48104
734.662.4457
www.smithgroup.com

ISSUED FOR	REV	DATE
CONCEPT PLAN SUBMITTAL	1	250CT2022

SEALS AND SIGNATURES

NOT FOR CONSTRUCTION

KEY PLAN

DRAWING TITLE
EXISTING CONDITIONS PLAN

0' 15' 30' 60'
SCALE: 1" = 30'

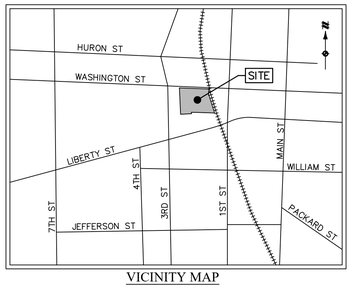
SCALE 13308.000

PROJECT NUMBER CV100

DRAWING NUMBER

FILE: C:\Users\bwoodle\SmithGroup Companies Inc\PRJ – 13308 – SmithGroup\CAD\05 Civil\13308–CV100.dwg USER: bwoodle DATE: Oct., 24 2022 TIME: 03:13 pm

ALTA/NSPS LAND TITLE SURVEY



VICINITY MAP
NOT TO SCALE

SOURCE BENCHMARKS:

AAGRS NO. 0013A
ELEVATION: 829.12 (NAVD88)

AAGRS NO. 0019
ELEVATION: 974.71 (NAVD88)

SITE BENCHMARKS:

BM #1: RAILROAD SPIKE IN NORTHWEST FACE OF UTILITY POLE ON WEST SIDE OF RAILROAD TRACKS
ELEVATION: 804.29 (NAVD88)

BM #2: RAILROAD SPIKE IN NORTH FACE OF UTILITY POLE IN SOUTHERLY RIGHT OF WAY OF LIBERTY STREET
ELEVATION: 809.78 (NAVD88)

BM #3: ARROW ON FIRE HYDRANT IN NORTHERLY RIGHT OF WAY OF WASHINGTON STREET
ELEVATION: 801.14 (NAVD88)

LEGEND

- SECTION CORNER
- FIP — FOUND IRON PIPE
- FCIP — FOUND CAPPED IRON PIPE
- FCIR — FOUND CAPPED IRON ROD
- SCIR — SET CAPPED IRON ROD
- F — FOUND MAG NAIL
- EXISTING SIGN
- EXISTING WATER VALVE
- EXISTING FIRE HYDRANT
- EXISTING MANHOLE/CATCH BASIN
- EXISTING BOLLARD
- EXISTING TELEPHONE RISER
- EXISTING UTILITY HANDHOLE
- EXISTING PARKING METER
- EXISTING LIGHT POLE
- EXISTING ELECTRIC TRANSFORMER
- EXISTING GROUND LIGHT
- EXISTING TRAFFIC SIGNAL
- EXISTING UTILITY POLE
- EXISTING GUY ANCHOR
- EXISTING MONITORING WELL
- EXISTING TREE WITH TAG BY ATWELL
- UNDERGROUND CABLE MARKER
- UNDERGROUND ELECTRIC MARKER
- UNDERGROUND TELEPHONE MARKER
- UNDERGROUND WATER MARKER
- UNDERGROUND GAS MARKER
- BOUNDARY LINE
- BOUNDARY ADJACENT LINE
- RIGHT OF WAY CENTERLINE
- EASEMENT LINE
- OVERHEAD UTILITY LINE
- UNDERGROUND ELECTRIC LINE
- UNDERGROUND GAS LINE
- UNDERGROUND WATER LINE
- UNDERGROUND TELEPHONE LINE
- UNDERGROUND STORM LINE
- UNDERGROUND SANITARY LINE
- EXISTING FENCE
- EXISTING RAILROAD TRACK
- EXISTING CURB AND GUTTER
- EXISTING GROUND CONTOUR
- (P) PLATTED
- (R) RECORD
- (M) MEASURED
- EXISTING BUILDING
- EXISTING BUILDING (ON PROPERTY)
- SCHEDULE B, PART II EXCEPTION
- × 822.79 — EXISTING GROUND ELEVATION
- × 822.79TC — EXISTING CURB ELEVATION
- × 822.79GU — EXISTING GUTTER ELEVATION
- × 822.79EP — EXISTING PAVEMENT ELEVATION
- FLOOD ZONE AE
- FLOOD ZONE X (0.2%)
- FLOODWAY AE
- FLOOD ZONE X (OUTSIDE 0.2%)

CONTROL:

1: SET PK NAIL
N: 284669.17 E: 13289789.90 EL: 809.62 (NAVD88)

2: SET PK NAIL
N: 286151.65 E: 13289071.61 EL: 798.38 (NAVD88)

3: SET PK NAIL
N: 284613.95 E: 13289857.42 EL: 809.49 (NAVD88)

4: SET PK NAIL
N: 284611.90 E: 13289680.98 EL: 815.37 (NAVD88)

5: SET MAG NAIL
N: 285098.91 E: 13289583.98 EL: 799.12 (NAVD88)

6: SET CONCRETE NAIL
N: 285109.76 E: 13289398.11 EL: 800.21 (NAVD88)

90493: SET MAG NAIL
N: 284925.73 E: 13289502.21 EL: 799.33 (NAVD88)

90233: SET NAIL
N: 284771.62 E: 13289705.34 EL: 814.52 (NAVD88)

90397: SET PK NAIL
N: 284827.76 E: 13289750.46 EL: 802.88 (NAVD88)

90398: SET PK NAIL
N: 284913.73 E: 13289707.42 EL: 801.37 (NAVD88)

90412: SET PK NAIL
N: 284806.19 E: 13289670.30 EL: 802.03 (NAVD88)

90446: SET PK NAIL
N: 284819.32 E: 13289577.52 EL: 800.57 (NAVD88)

90463: SET PK NAIL
N: 284827.86 E: 13289442.58 EL: 799.85 (NAVD88)

811
Know what's below.
Call before you dig.
THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

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866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 29
TOWN 2 SOUTH, RANGE 6 EAST
CITY OF ANN ARBOR
WASHTENAW COUNTY, MICHIGAN

CLIENT
CITY OF ANN ARBOR HOUSING COMMISSION

BOUNDARY & TOPOGRAPHIC SURVEY & ALTA/NSPS LAND TITLE SURVEY

LOCATED IN

DATE
10/21/2021

03/17/2022 REV. PER ADDITIONAL PARCELS
04/01/2022 REV. PER ADDITIONAL FIELD INFO

REVISIONS

SCALE 0 15 30
1" = 30 FEET

DR. JR | CH. LMD
P.M. C. KELLY
BOOK NA
JOB 21003642
SHEET NO.
2 OF 2

CAD FILE: 21003642TP-01.DWG

G:\2021\21003642\SURVEY\21003642TP-01.DWG 4/1/2022 10:17 AM ALEX BENICKE

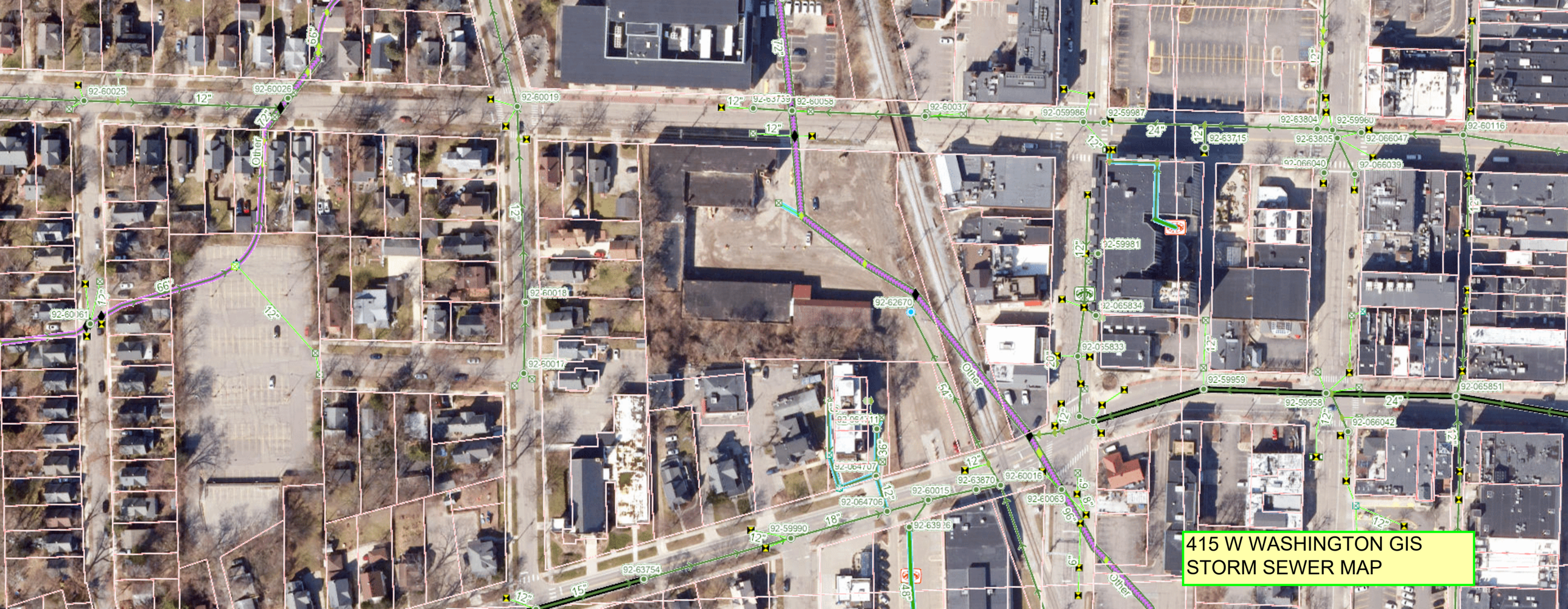

415 W WASHINGTON GIS
STORM SEWER MAP

PHOTO CA 1940'S COURTESY WASHTENAW COUNTY ROAD COMMISSION

15 WEST WASHINGTON

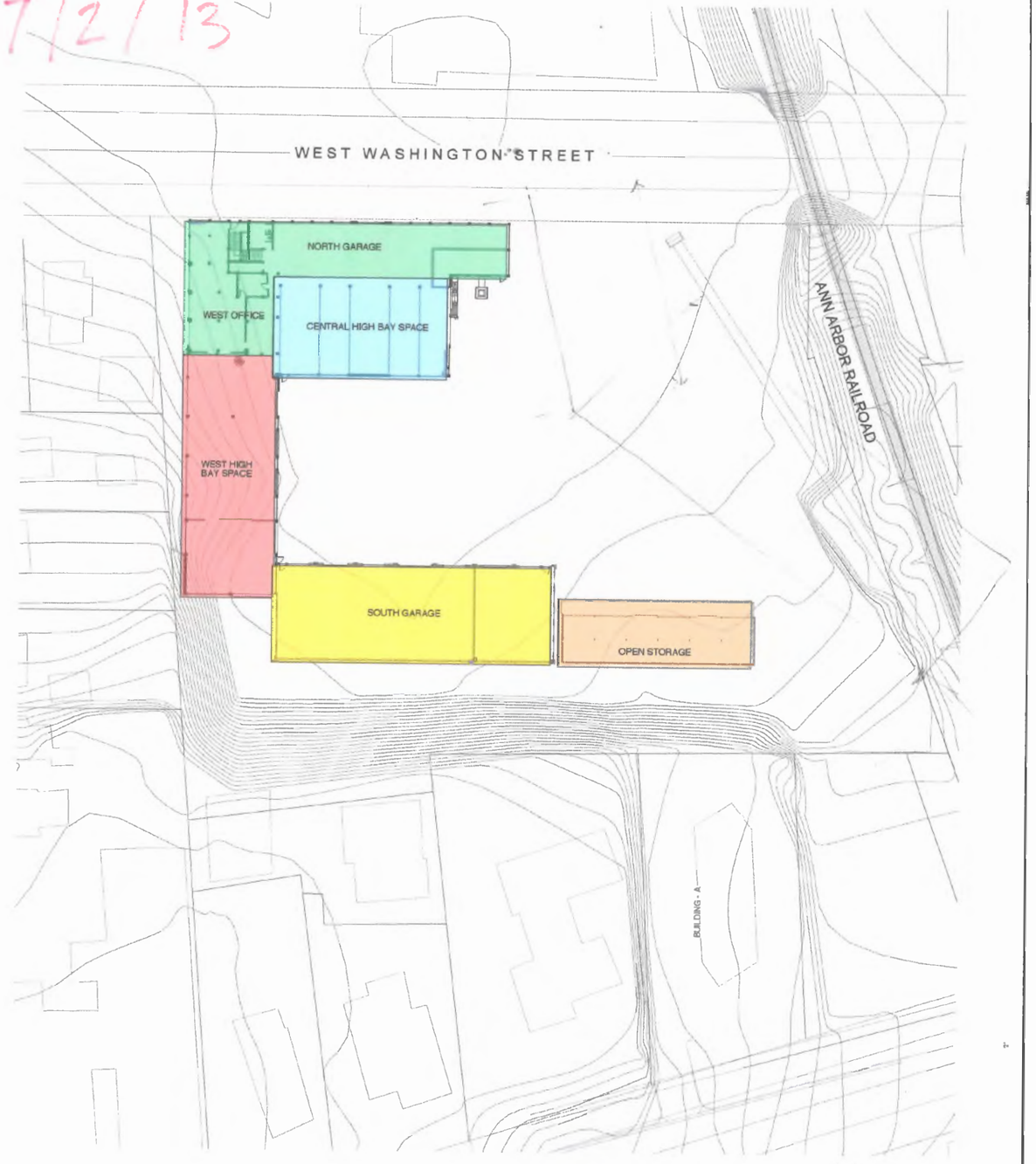
D WASHTENAW COUNTY ROAD COMMISSION BUILDING

BUILT DRAWINGS

OF DRAWINGS

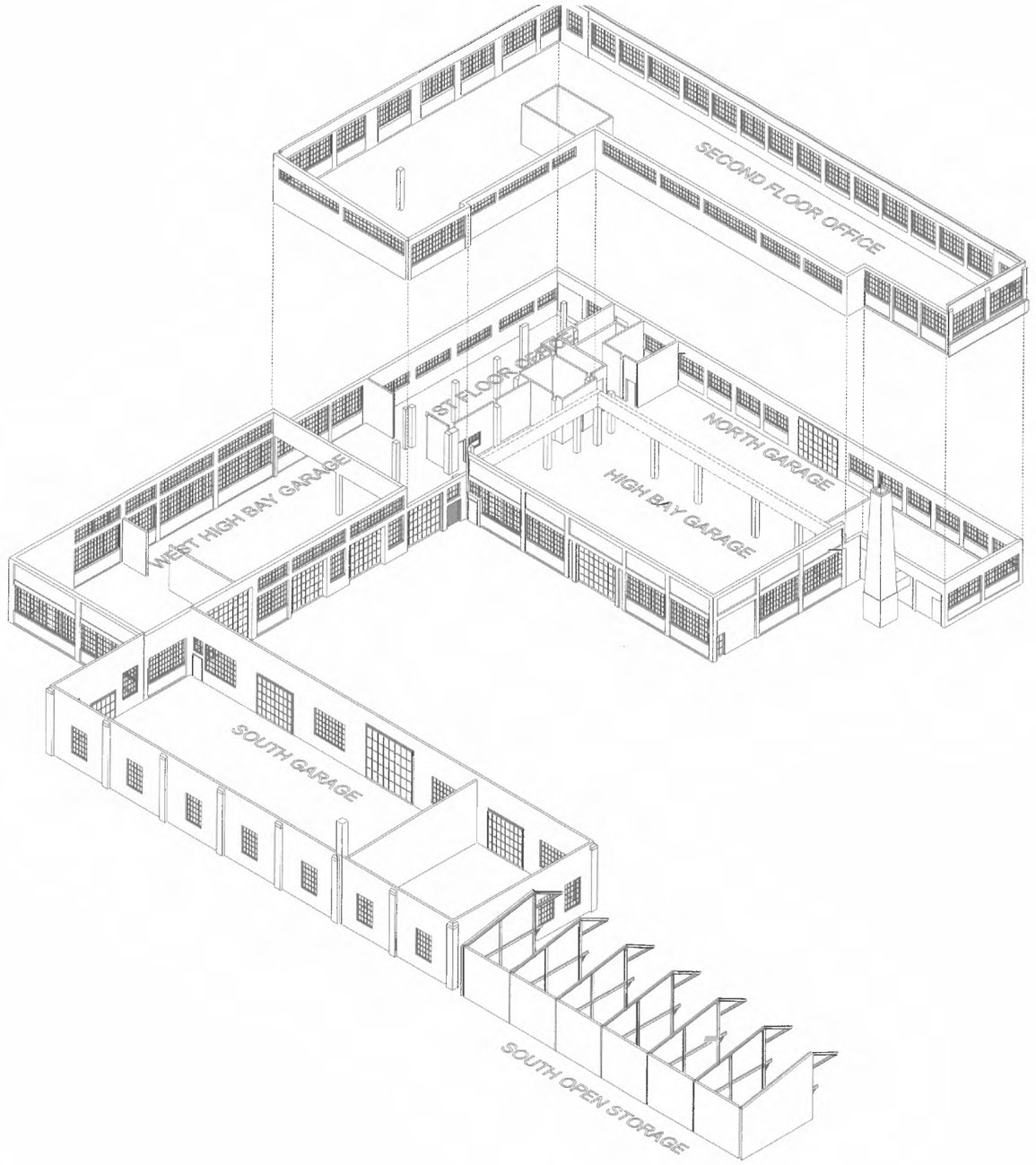
SITE PLAN AND TITLE SHEET
ISOMETRIC MODEL AND SQUARE FEET ANALYSIS
SECOND AND FIRST FLOOR PLANS @ 1/16" SCALE
FIRST FLOOR PLANS @ 1/8" SCALE
NORTH AND SOUTH ELEVATIONS
EAST AND WEST ELEVATIONS

7/2/13



N

SITE PLAN
Scale: 1"=30'-0"



CONSTRUCTION NOTES

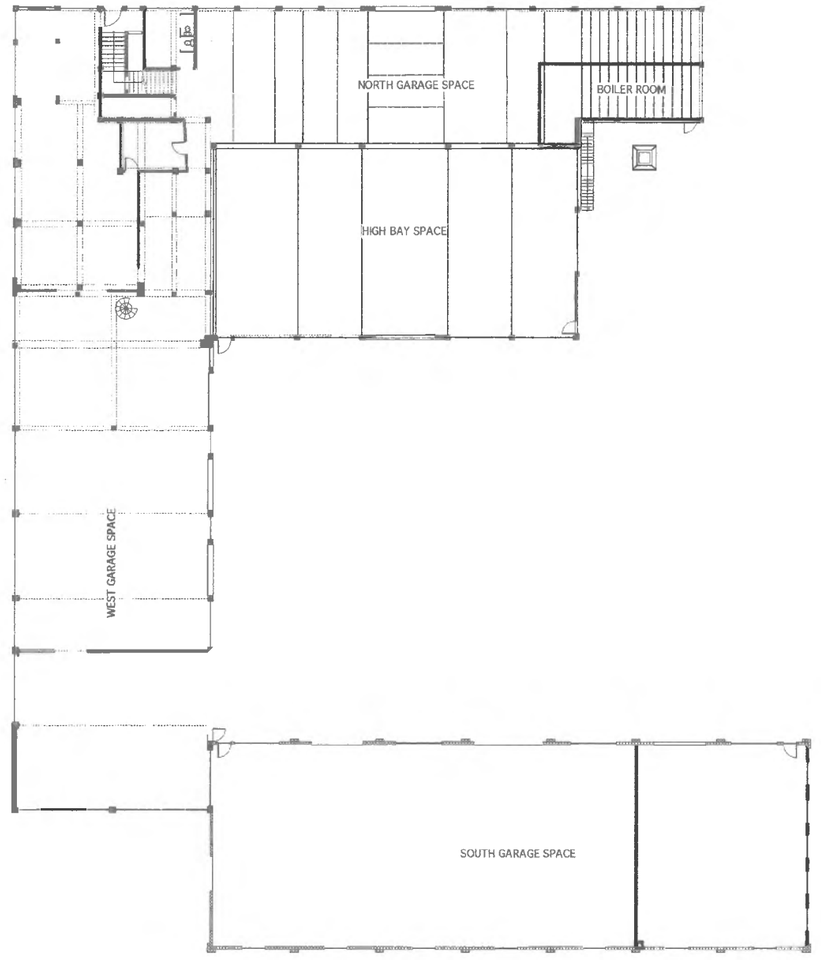
INTERIOR WALLS SHOWN ARE EITHER FORMED CONCRETE OR CONCRETE MASONRY. WOOD FRAMED AND PLASTERED WALLS HAVE NOT BEEN SHOWN.

SQUARE FEET

SECOND FLOOR OFFICE	8199 SF
NORTH GARAGE	3654 SF
FIRST FLOOR OFFICE	3004 SF
WEST HIGH BAY GARAGE	5771 SF
HIGH BAY GARAGE	4020 SF
SOUTH GARAGE	6838 SF
TOTAL ENCLOSED SF	31,486 SF
SOUTH OPEN STORAGE:	
1ST LEVEL	3290 SF
2ND LEVEL	2334 SF
TOTAL OPEN COVERED:	5624 SF

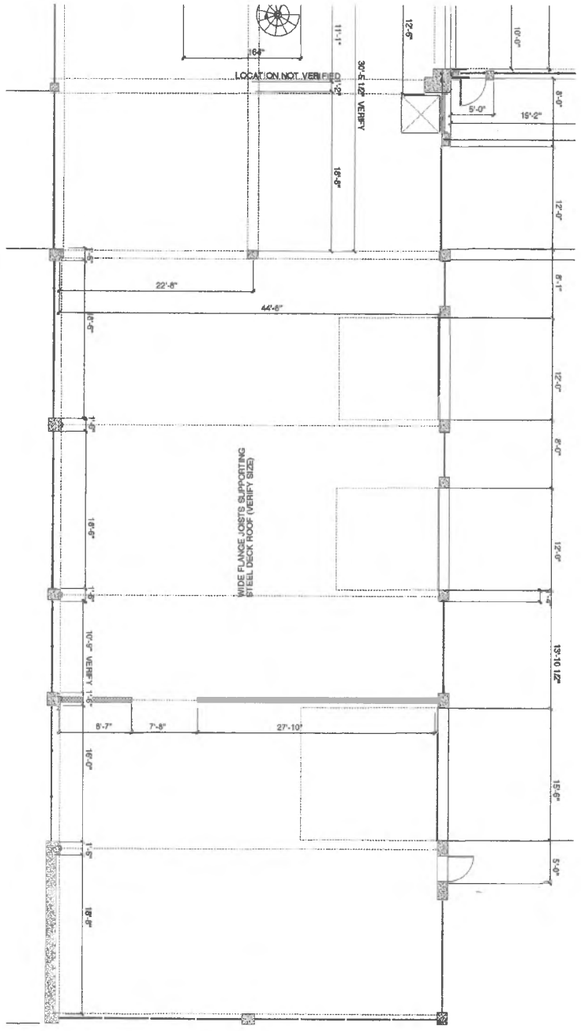
N

SECOND FLOOR PLAN
Scale: 1/16"=1'-0"



N

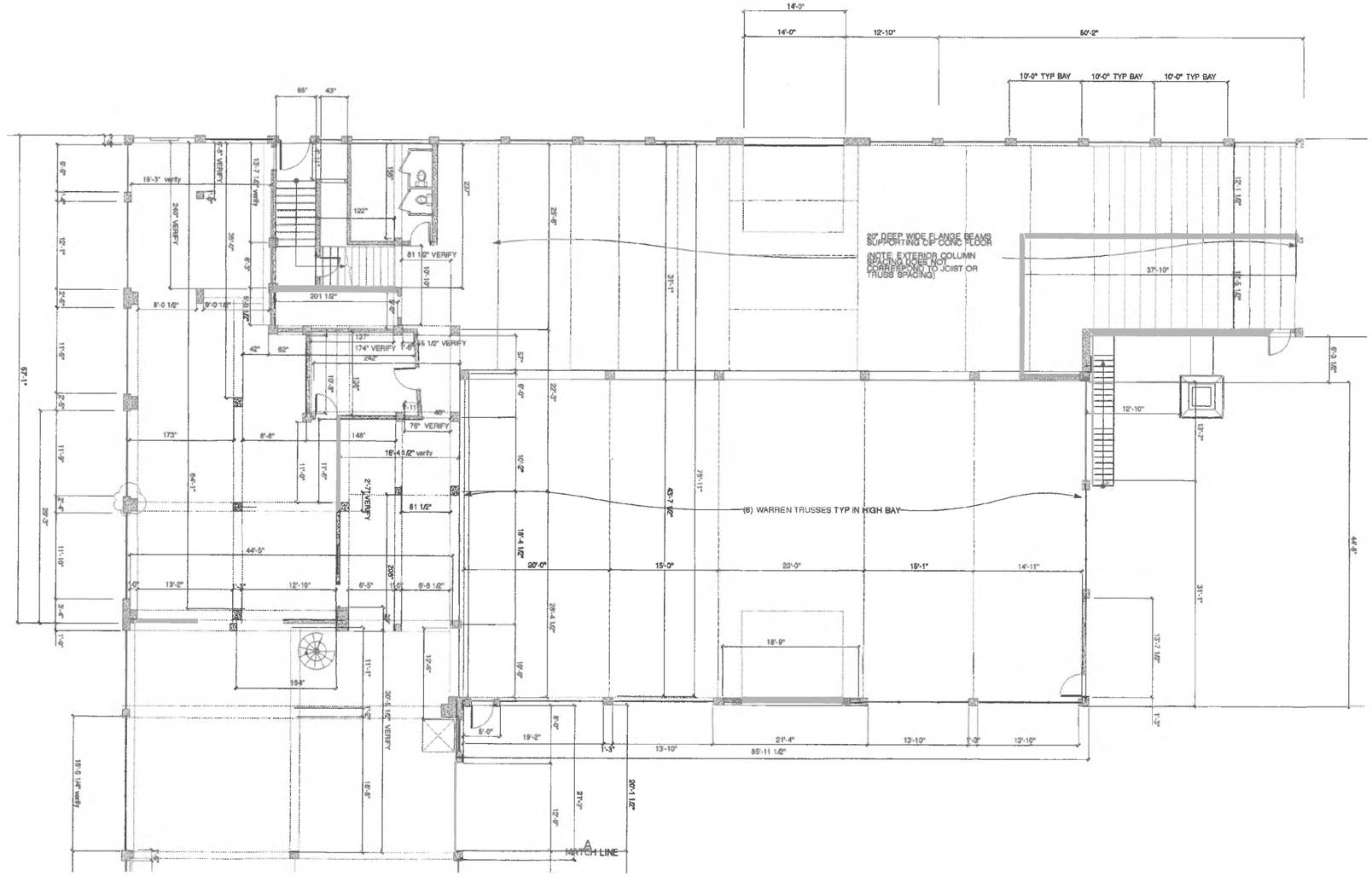
FIRST FLOOR PLAN
Scale: 1/16"=1'-0"



N

PARTIAL FIRST FLOOR PLAN OF WEST BAY

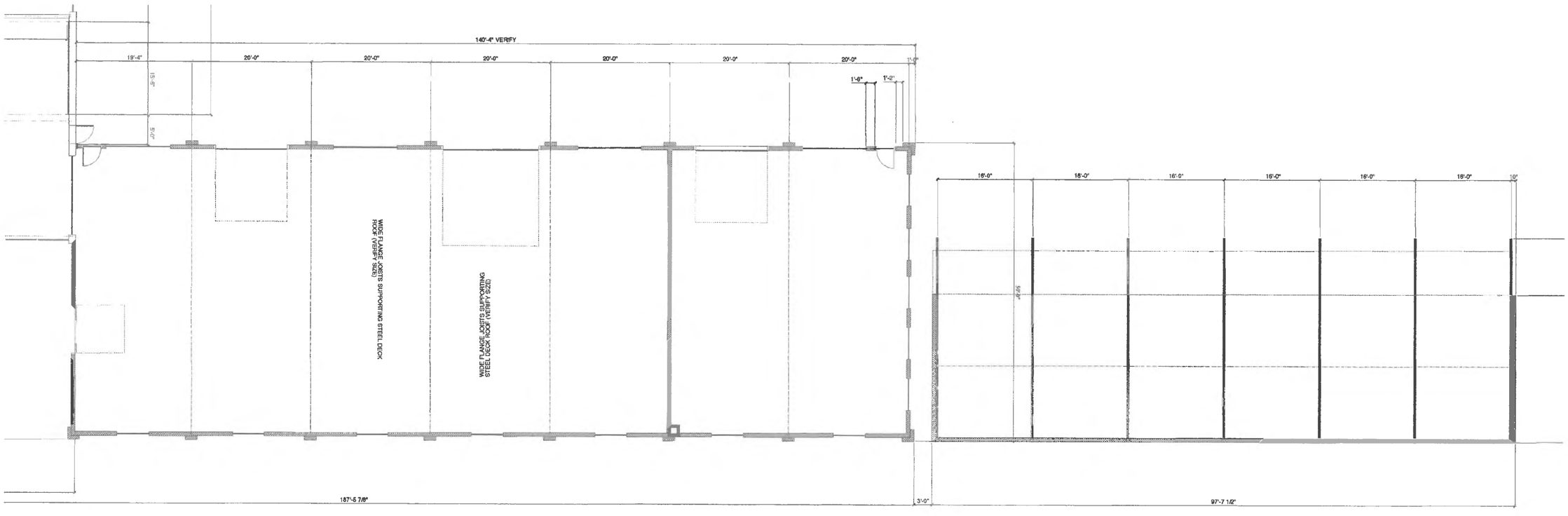
Scale: 1/8"=1'-0"



N

PARTIAL FIRST FLOOR PLAN

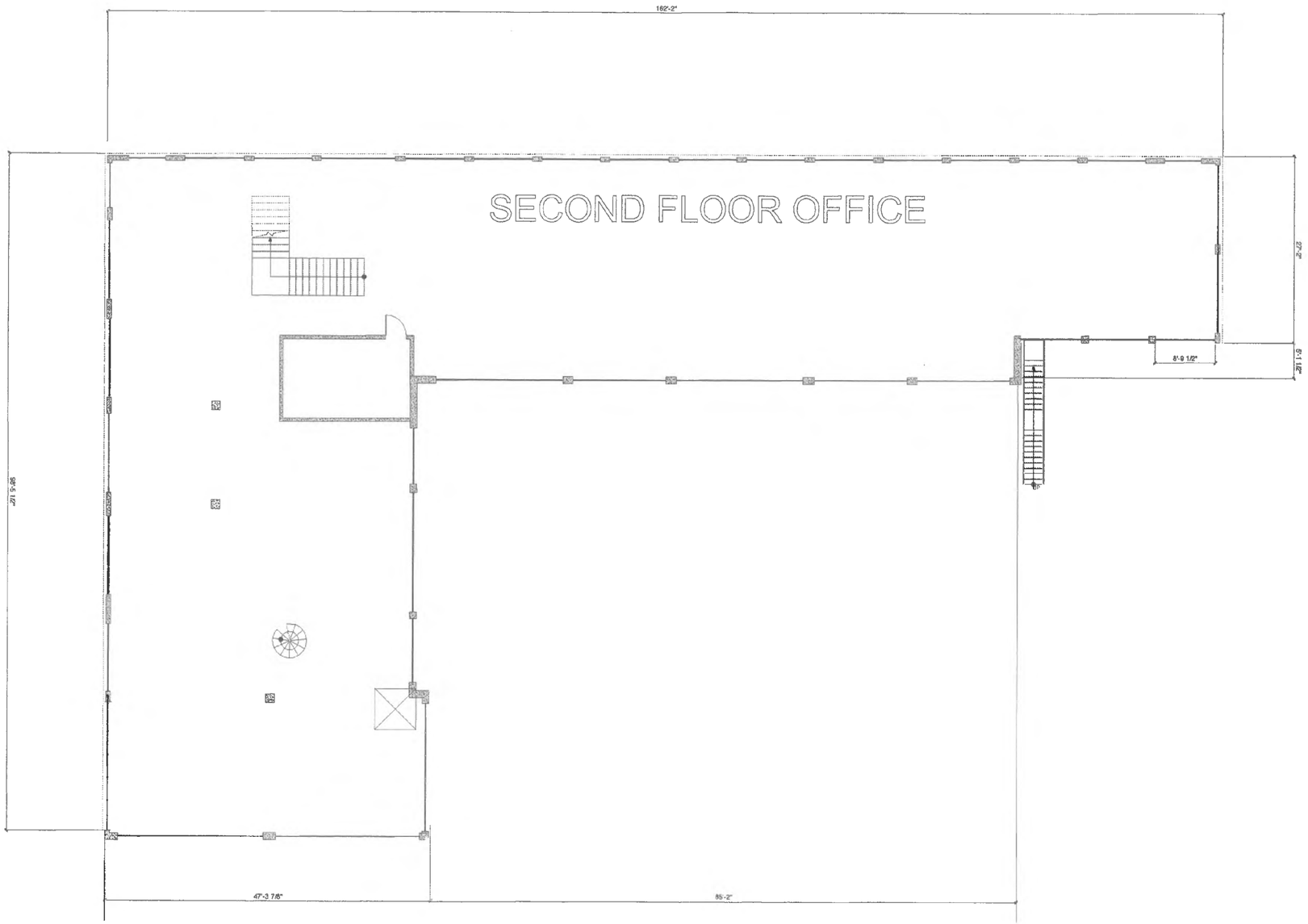
Scale: 1/8"=1'-0"



N

FIRST FLOOR PLAN

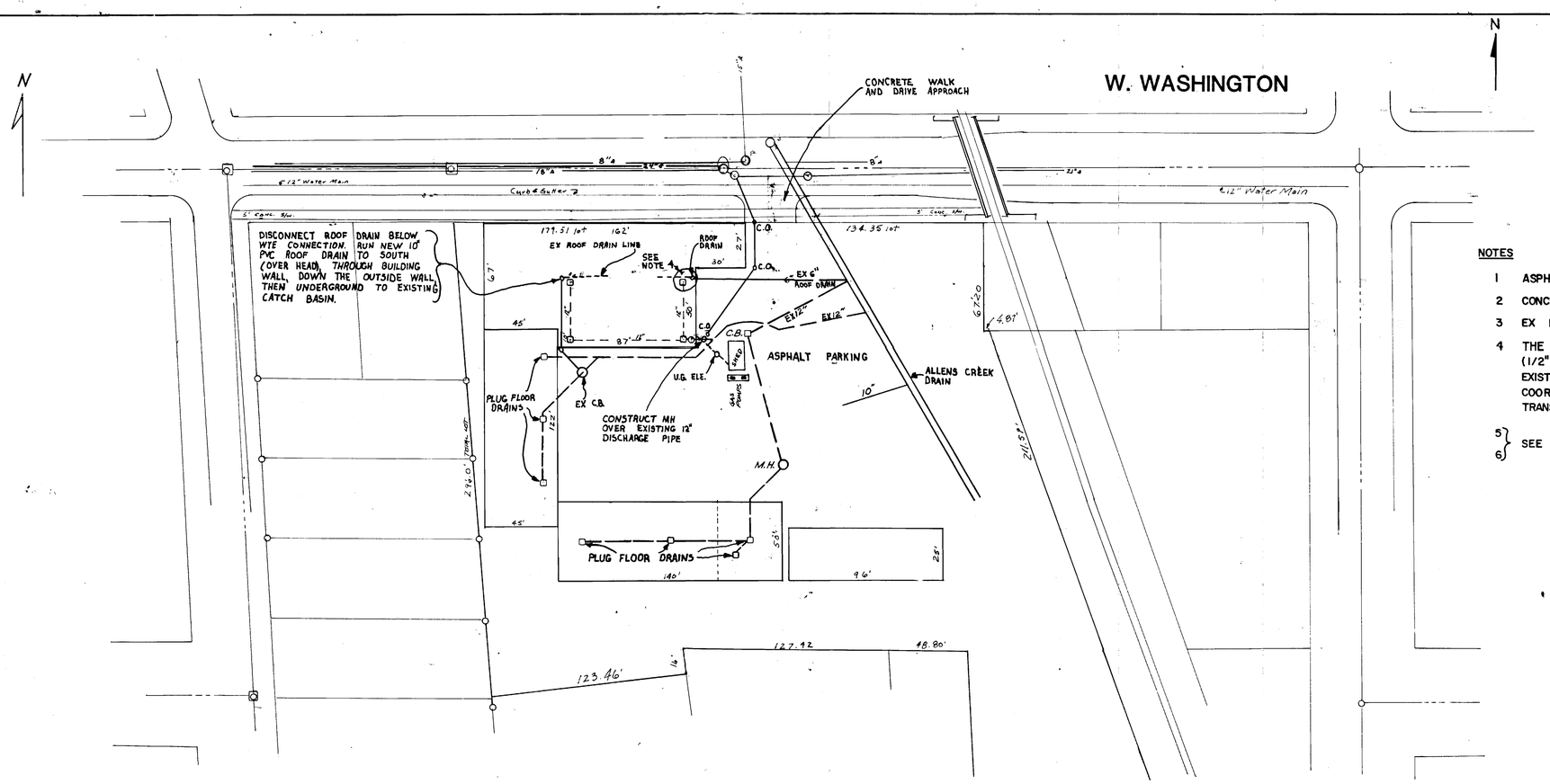
Scale: 1/8"=1'-0"



N

SECOND FLOOR PLAN

Scale: 1/8"=1'-0"

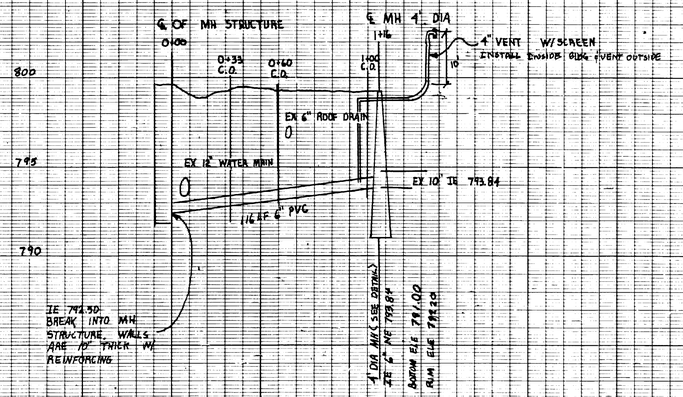


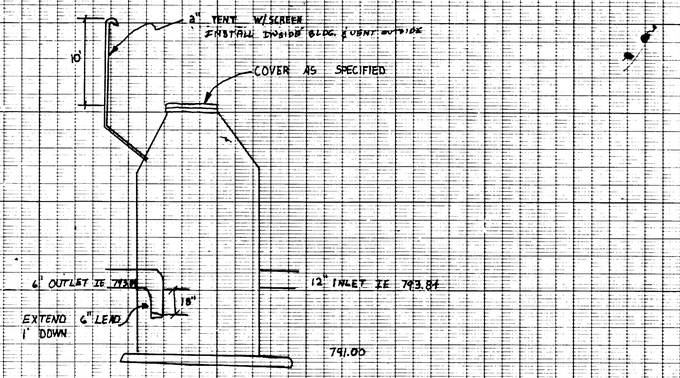
48 HOURS BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

NOTES

1. ASPHALT TO BE REMOVED IN NEAT STRAIGHT LINES.
2. CONCRETE TO BE REMOVED TO CLOSEST JOINT.
3. EX ROOF DRAIN LINES ARE THREADED CAST IRON.
4. THE EXISTING COOLING WATER DISCHARGE LINE (1/2" COPPER) IS TO BE REROUTED TO THE EXISTING VERTICAL ROOF DRAIN. CONTRACTOR TO COORDINATE WATER SHUT DOWN WITH TRANSPORTATION DEPARTMENT.
5. } SEE NOTES 3 & 4 SHEET 1.
6. }

NOT AS-BUILT, BEST AVAILABLE INFO.





PRECAST MANHOLE DETAIL 4' DIAMETER (NTS)

NOTE
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

GRAPHIC SCALE
TWO INCHES
0 1 2

SURVEY BOOK	DR. BY	CH. BY	DATE	NO. OR LETTER	REVISIONS	DR. BY	DATE
	J.A.	A.G.	7/85				

ENGINEERING DEPARTMENT – CITY OF ANN ARBOR

415 W. WASHINGTON

FLOOR DRAINS

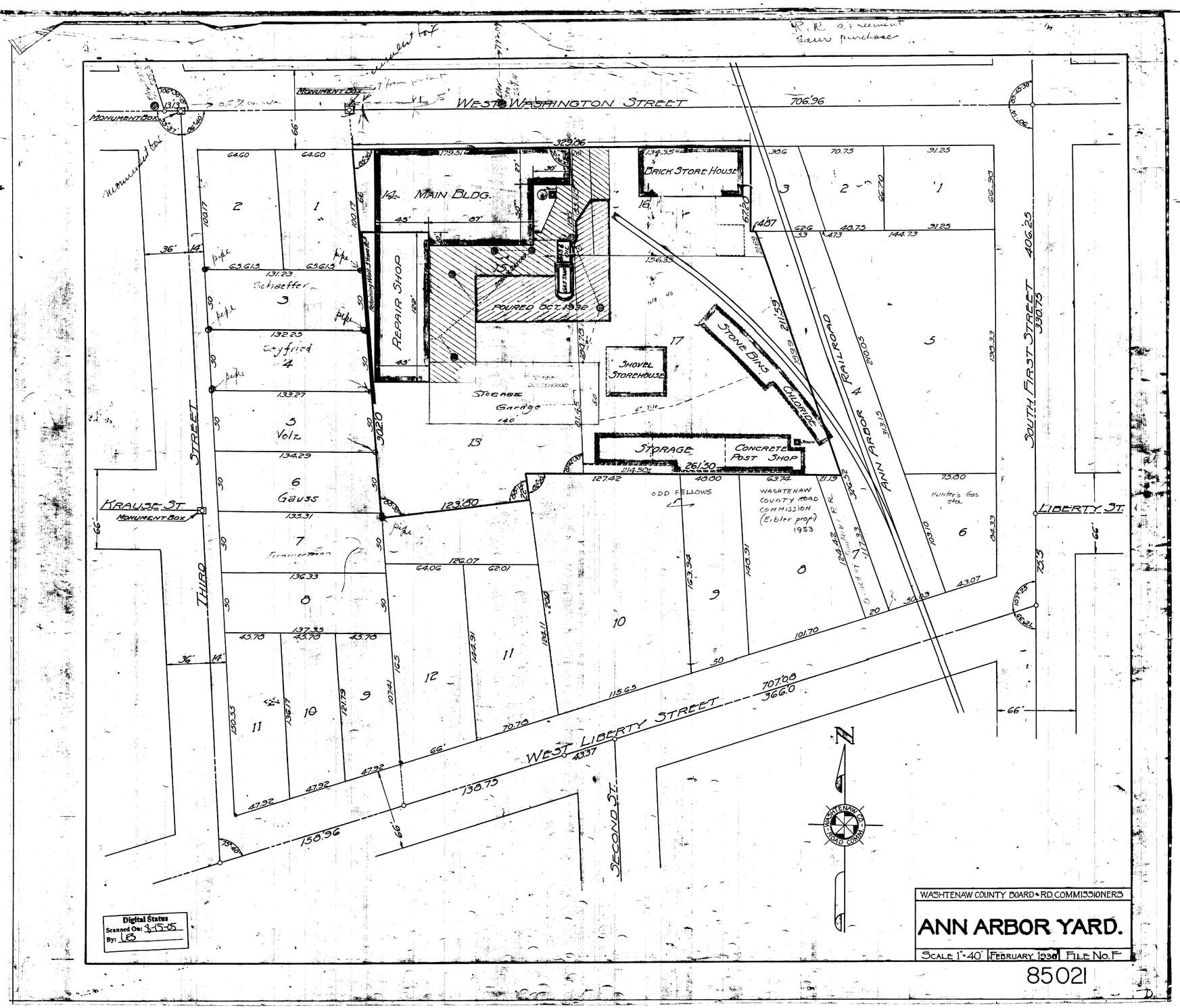
SCALE	
HORZ.	1" = 10'
VERT.	1" = 4'
INCH	

DRAWING NO. **85021-2**

SHEET NO. 2 OF 2

Digital Status
Scanned On: 9/15/05
By: LS

TELEDYNE POST N76886



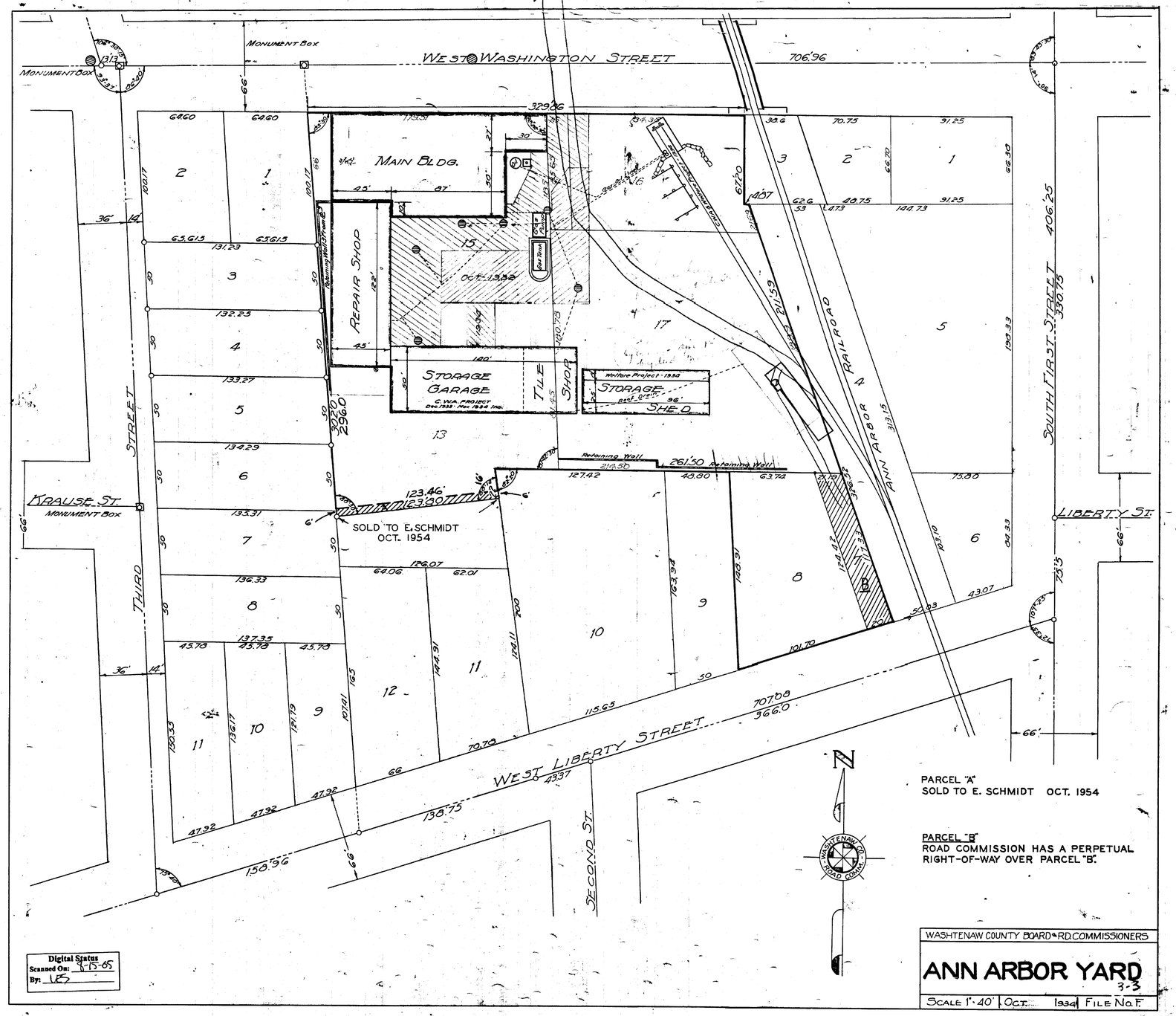
WASHTENAW COUNTY BOARD • RD. COMMISSIONERS

ANN ARBOR YARD.

SCALE 1"=40' | FEBRUARY 1930 | FILE No. F

85021

Digital Status
Scanned On: 8-15-05
By: LB



PARCEL "A"
SOLD TO E. SCHMIDT OCT. 1954

PARCEL "B"
ROAD COMMISSION HAS A PERPETUAL RIGHT-OF-WAY OVER PARCEL "B".

WASHTENAW COUNTY BOARD & RD. COMMISSIONERS

ANN ARBOR YARD

3-3

SCALE 1" = 40' | OCT. 1934 | FILE No. F

Digital Status
Scanned On: 8-15-05
By: VES

85021 (2)

WATER MANHOLE
RIM ELEVATION 799.34'

STORM MANHOLE
RIM ELEVATION 799.43'
18" PIPE E&W 781.4'

SANITARY MANHOLE
RIM ELEVATION 799.44'
8" N&E 791.7'

STORM MANHOLE
RIM ELEVATION 799.51'
18" SOUTH 791.5'
24" WEST 791.3'
18" NORTH 791.1'

ALLEN CREEK DRAIN
RIM ELEVATION 798.87'
BOTTOM OF PIPE 790.6'

STORM MANHOLE
RIM ELEVATION 799.17'
12" E&W 791.1'

C/L WASHINGTON STREET
66' WIDE

S 89°42'50" E
709.28'

TOP OF CURB 798.56'
INV ELEV 796.5'

TOP OF CURB 798.21'
INV ELEV 796.1'

TOP OF CURB 798.23'
INV ELEV 796.0'

TOP OF CURB 798.3'
INV ELEV 796.2'

BRIDGE

15" MAPLE
15" MAPLE
16" MAPLE
13" MAPLE
13" MAPLE
12" MAPLE

S 89°42'50"E
330.34'

14.00'

SHRUB

CONC. STRUCTURE

BENCHMARK – R.R. SPIKE IN W. SIDE OF POWER POLE. ELEV = 800.36'

TANK

2 STORY
BLOCK BUILDING
FLAT ROOF

STAIRS

STORAGE TANK

CONC. WALL

S 01°42'18" W
67.30'

S 89°57'45" E
4.87'

CONC. RETAINING WALL

STORAGE

SIGN

BLDG LIGHT

GAS PUMPS

CONCRETE

WOOD WALL

AREA WITHIN 100
YEAR FLOOD PLAIN

N 03°05'56" W
622.64'

C/L WEST THIRD STREET

KRAUSE ADDITION

S 03°13'37" W
296.44'

CONC. WALL

OVERHANG

OPEN AIR POLE BARN

FLOOD PLAIN LIMITS

WOOD WALL

CONC. WALL

TREES & BRUSH

S 84°11'37" W
122.98'

BUILDING

BUILDING

ASPHALT PARKING

ASPHALT PARKING

N 89°57'04" W
176.04'

SERVICE ISLAND

ASPHALT

ASPHALT CURBING

N 03°07'56" W
149.07'

ASPHALT

ASPHALT

PHONE BOOTH

S 72°36'14" W
121.67'

5" CONC. WALK

5" MAPLE

5" MAPLE

5" MAPLE

T/C 809.51'
INV 806.7'

T/C 809.13'
INV 804.4'

BENCHMARK – SET RR SPIKE IN WEST FACE OF POWER POLE ON NORTH SIDE OF LIBERTY STREET, 100' WEST OF FIRST STREET. ELEVATION = 815.86'
CITY OF ANN ARBOR DATUM

SANITARY MANHOLE
RIM ELEVATION 809.55'
12" SE&W 795.3'

STORM MANHOLE
RIM ELEVATION 810.74'
18" E&W 804.2'

C/L LIBERTY 66' WIDE

S 72°36'14" W
707.83'

SECOND STREET

FIRST STREET 66' WIDE

SOUTH
330.87'

406.56'

75.69'

ANN ARBOR RAILROAD

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

LEGAL DESCRIPTION

Beginning at the S.E. Corner of Lot 7, Block 2 of Assessor's Plat No. 3 of the City of Ann Arbor as recorded in Liber 2 of Plats, page 39, Washtenaw County Records, Washtenaw County, Michigan; thence S 72°36'14" W 121.67 feet along the northerly line of Liberty Street; thence N 03°07'56" W 149.07 feet along the west line of Lot 8; thence N 89°57'04" W 176.04 feet along the northerly line of Lots 9 and 10; thence S 07°30'48" E 16.00 feet along the westerly line of said Lot 10; thence S 84°11'37" W 122.98 feet; thence N 04°11'53" W 296.44 feet along the westerly line of Lots 13 and 14; thence S 89°42'50" E 330.34 feet along the sbutherly line of Washington Street; thence S 01°42'18" W 67.30 feet along the westerly line of Lot 3; thence S 89°57'45" E 4.87 feet along the south line of said Lot 3; thence S 19°19'07" E 329.59 feet along the east line of Lot 4 to the Point of Beginning. Being Lots 7, 8, 14, 15, 16, 17 and part of Lot 13 of said Assessor's Plat No. 3 and containing 2.505 acres of land, more or less. Subject to an easement for Allen's Creek Drain. Also subject to other easements of record, as recorded.

LEGEND

- ⌀TP TELEPHONE POLE
- ☼ LIGHT POLE
- ⌀GUY GUY POLE
- ⌀PT POWER POLE
- ■ MONUMENT BOX WITH IRON PIPE
- Os SANITARY SEWER
- OST STORM SEWER
- ● ROUND CATCH BASIN
- ▬ CURB INLET
- ▣ SQUARE CATCH BASIN
- ● FILL PORT FOR BURIED TANK
- ⊣ SIGN
- BB BILL BOARD

Digital Status
Scanned On: 6-15-05
By: LB

REV.		
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	–	ORIGINAL ISSUE: 05-06-91

DRAWN BY: – P.V.S. CHECKED BY: – C.R.O.

AYRES, LEWIS, NORRIS & MAY, INC.
ENGINEERS - PLANNERS - SURVEYORS

MAY 09 1991

Ann Arbor, Michigan 48108

SEALED:

CITY OF ANN ARBOR
WASHINGTON STREET DPW

FLOOD PLAIN MAP

Ayres, Lewis, Norris & May, Inc.
Engineers • Planners • Surveyors
3950 Research Park Drive
Ann Arbor, Michigan 48108
(313) 761-1010

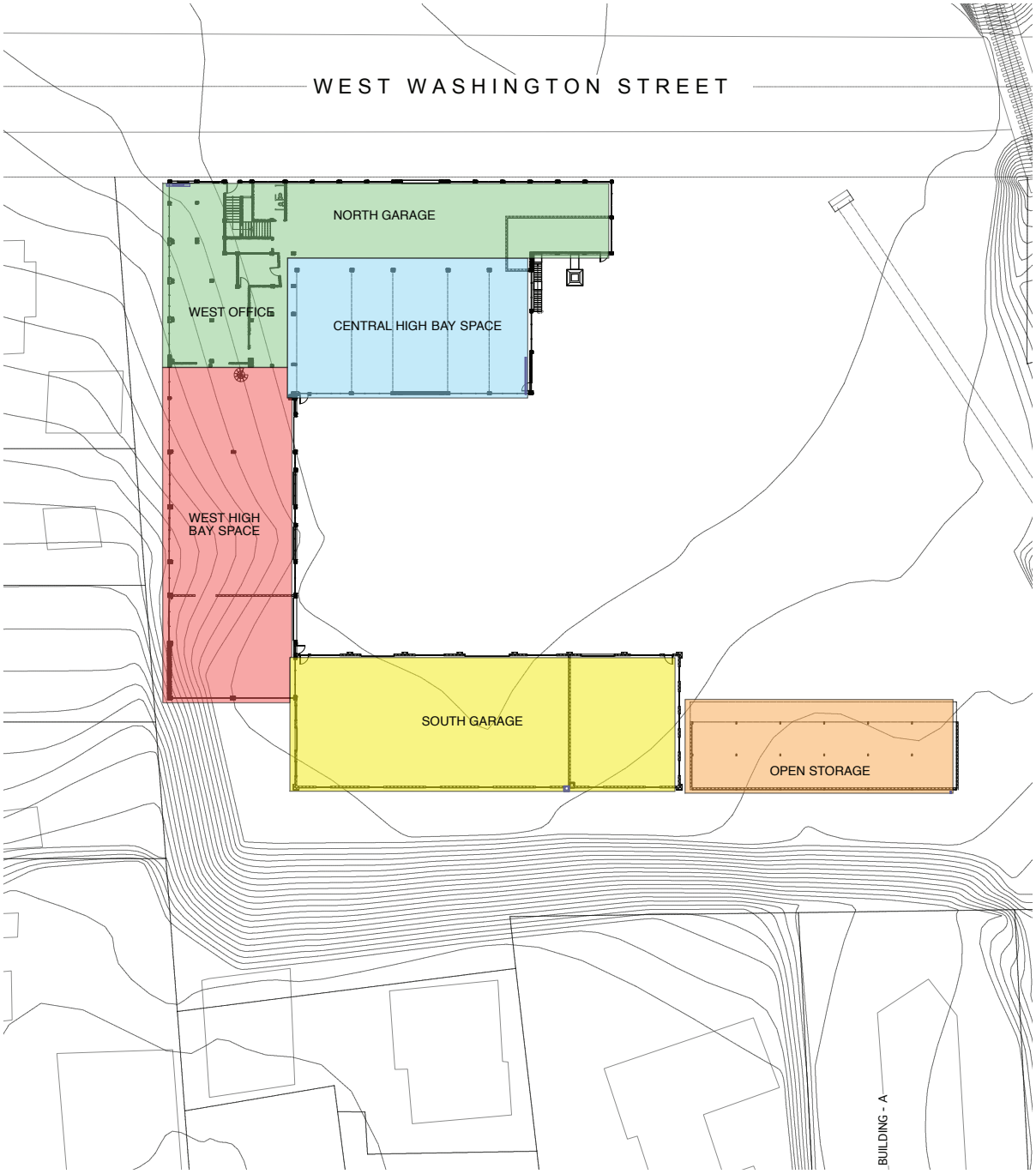
SCALE: – 1" = 30'

55462-01

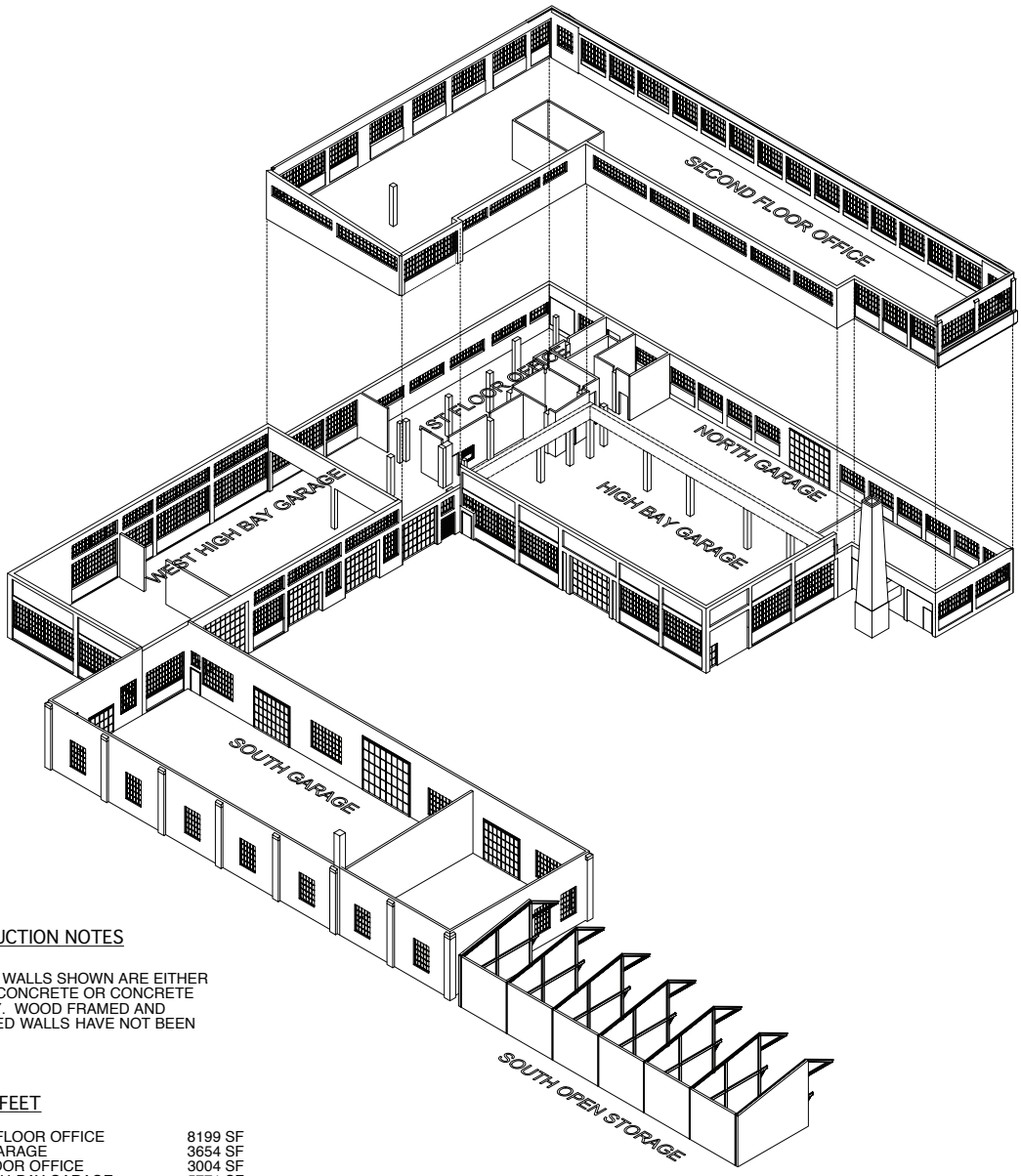
1(2)

Architectural Documentation of Structures

On the following pages are drawings from the architectural documentation portion of the study. These drawings may or not be to scale in this document. For scaleable high resolution drawings visit the City Website.



Site Plan



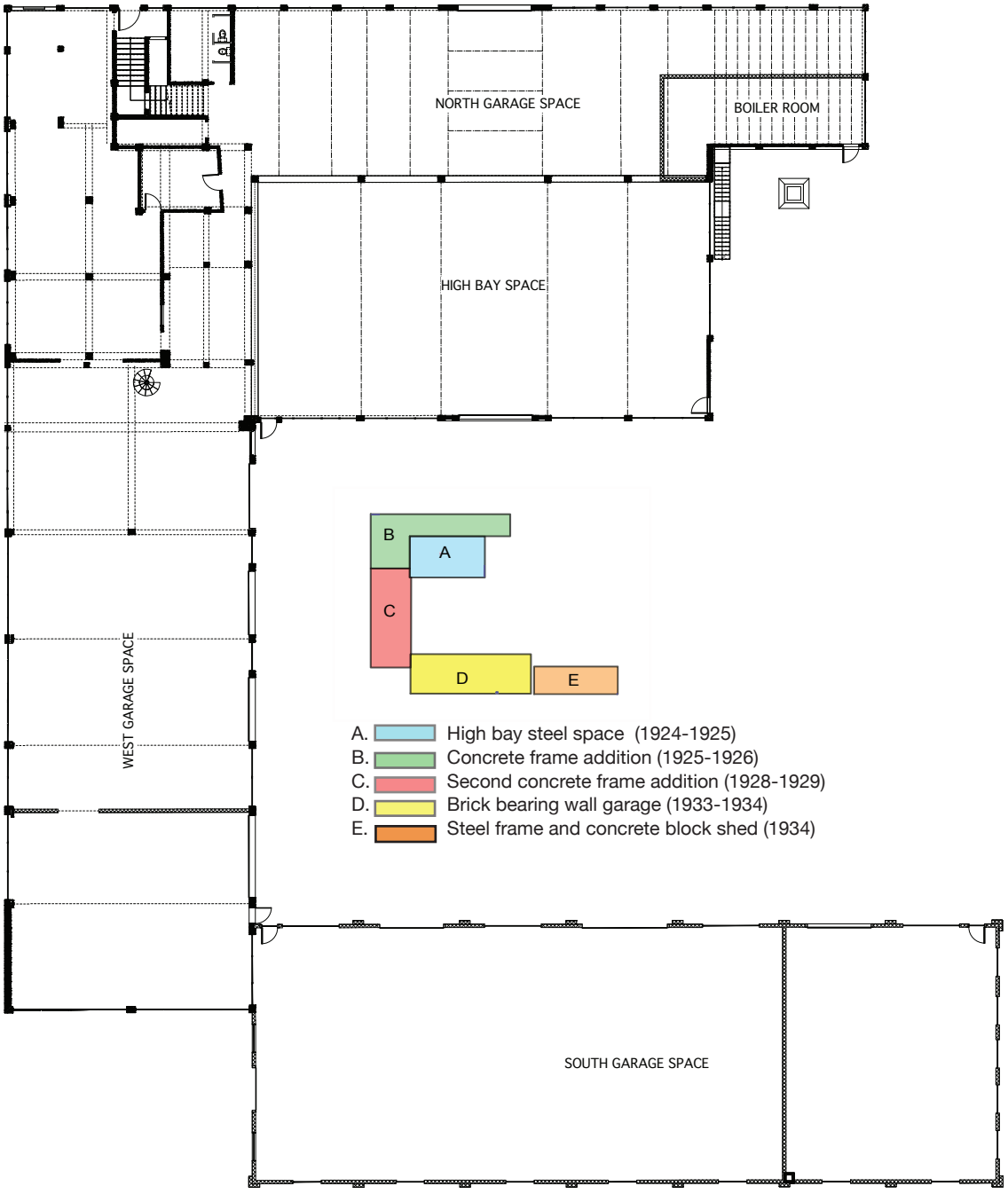
CONSTRUCTION NOTES

INTERIOR WALLS SHOWN ARE EITHER FORMED CONCRETE OR CONCRETE MASONRY. WOOD FRAMED AND PLASTERED WALLS HAVE NOT BEEN SHOWN.

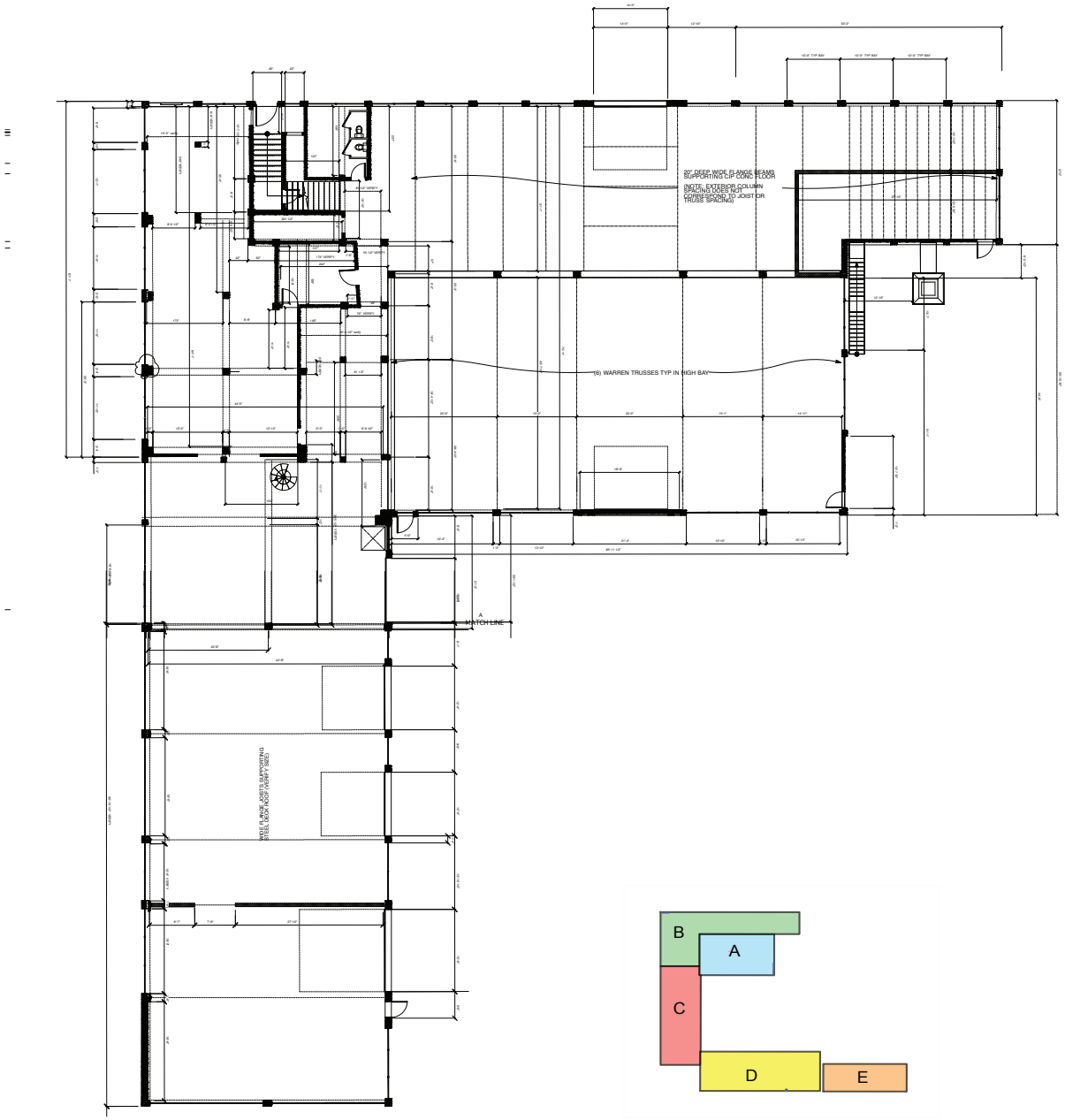
SQUARE FEET

SECOND FLOOR OFFICE	8199 SF
NORTH GARAGE	3654 SF
FIRST FLOOR OFFICE	3004 SF
WEST HIGH BAY GARAGE	5771 SF
HIGH BAY GARAGE	4020 SF
SOUTH GARAGE	6838 SF
TOTAL ENCLOSED SF	31,486 SF
SOUTH OPEN STORAGE:	
1ST LEVEL	3290 SF
2ND LEVEL	2334 SF
TOTAL OPEN COVERED:	5624 SF

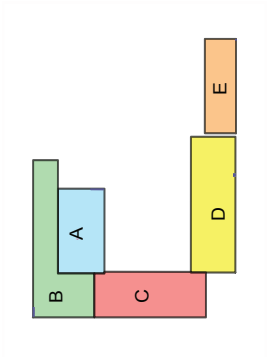
Isometric Drawing With Square Feet

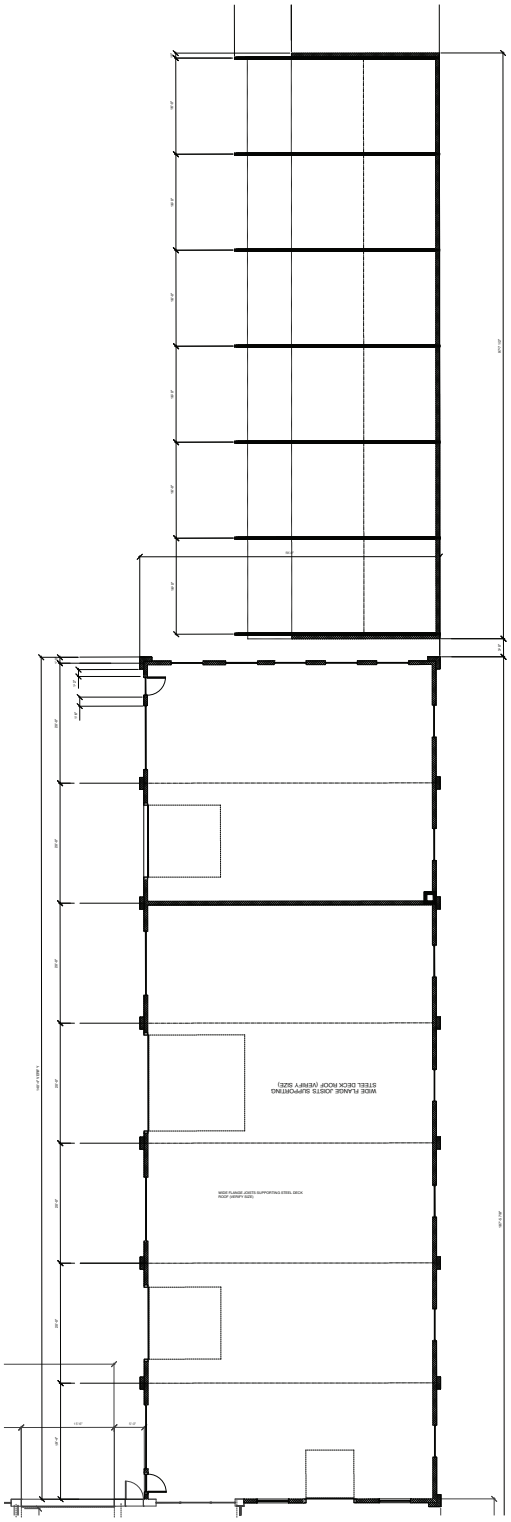


First Floor Layout Plan

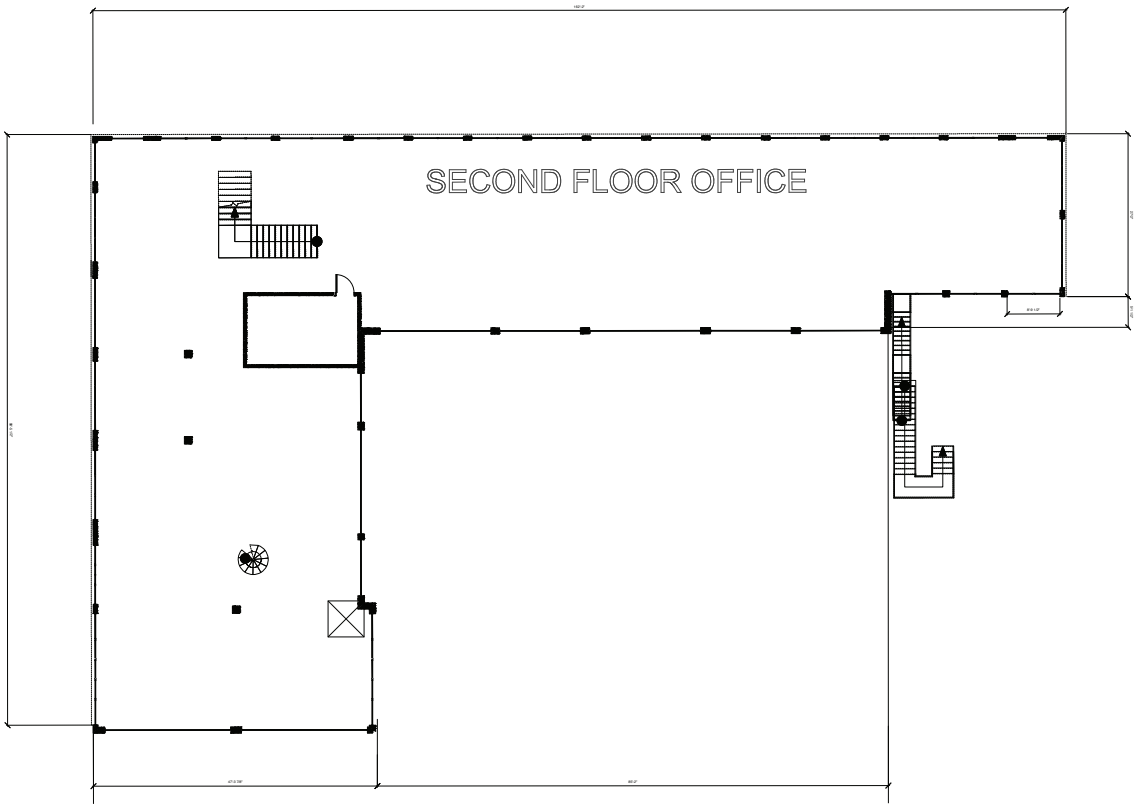


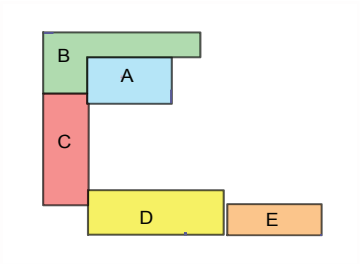
Buildings A, B, and C As Built First Floor Plan



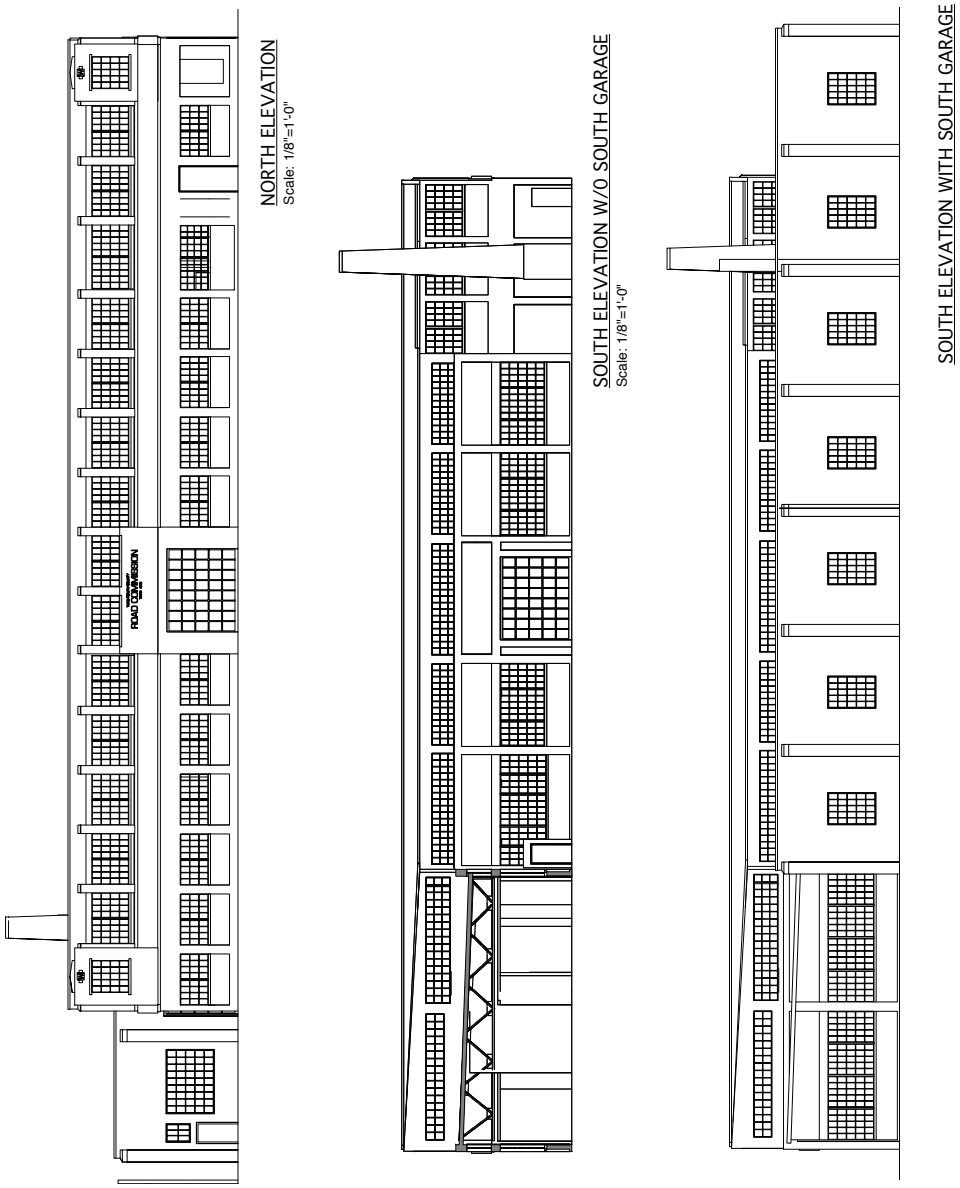


Buildings D and E As Built First Floor Plan (Rotated 90 deg CCW

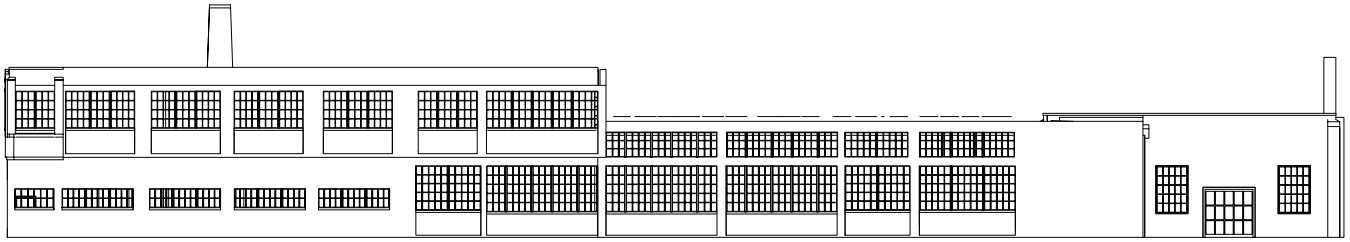




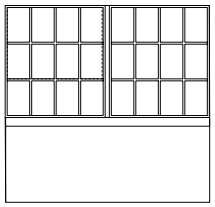
Buildings A, and B, Second Floor as Built Plan


NORTH ELEVATION
Scale: 1/8"=1'-0"
SOUTH ELEVATION W/O SOUTH GARAGE
Scale: 1/8"=1'-0"
SOUTH ELEVATION WITH SOUTH GARAGE

Elevations



WEST ELEVATION
Scale: 1/8"=1'-0"



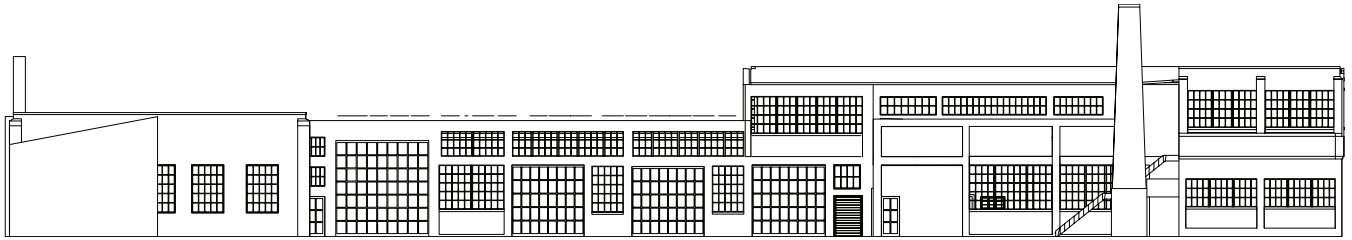
TYPICAL GLASS SIZE IS 12" X 18".

WINDOW UNITS ARE TYPICALLY 3, 4, OR 5 LITES WIDE. UNITS ARE MULLED TOGETHER TO ACCOMMODATE VARIOUS BAY WIDTHS.

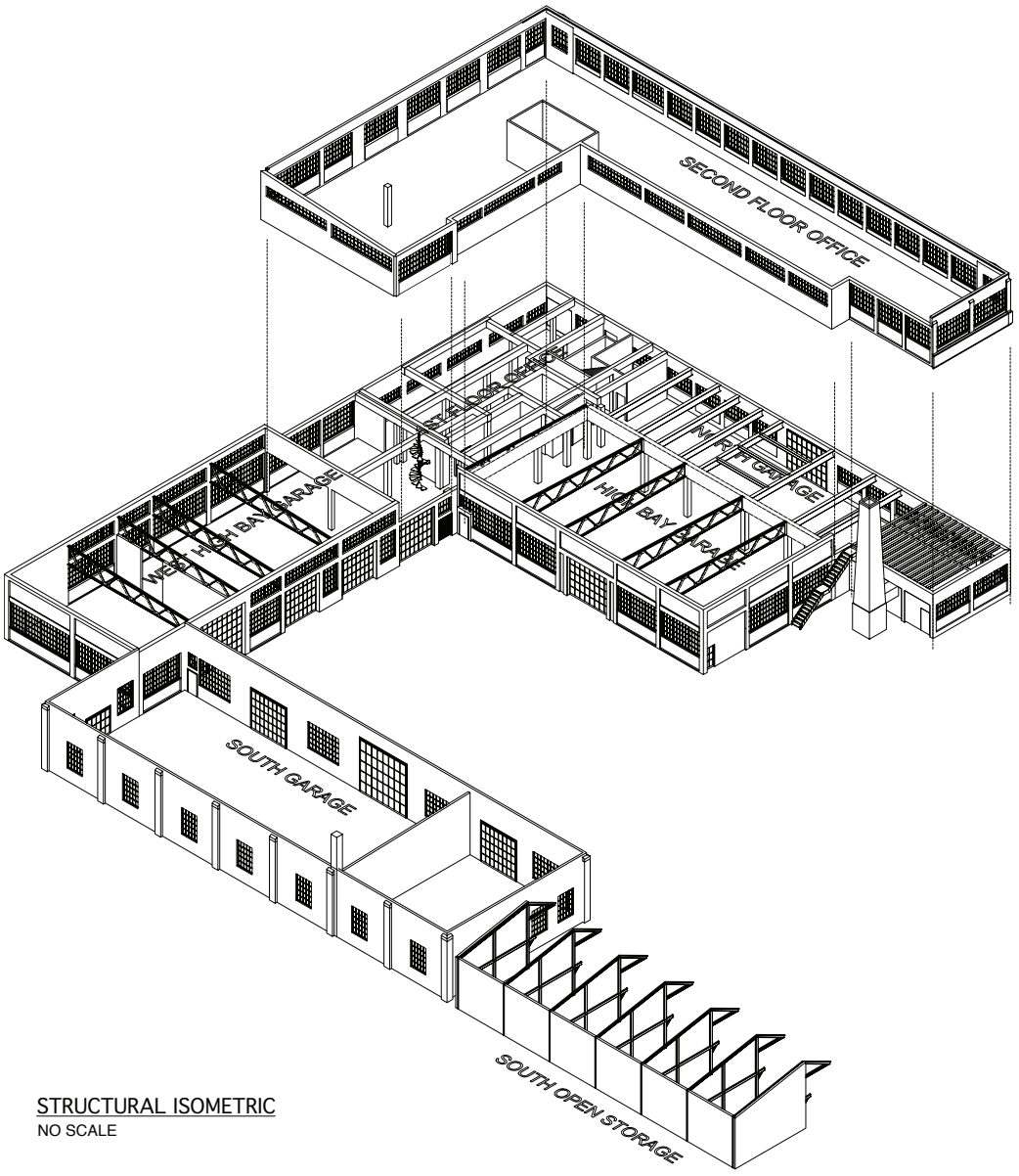
MOST GLAZED PANELS HAVE 6 OR 9 LITE PIVOT OPERATING UNITS.

TYP STEEL SASH ELEVATION
Scale: 1/2"=1'-0"

NORTH ELEVATION OF SOUTH GARAGE
Scale: 1/8"=1'-0"

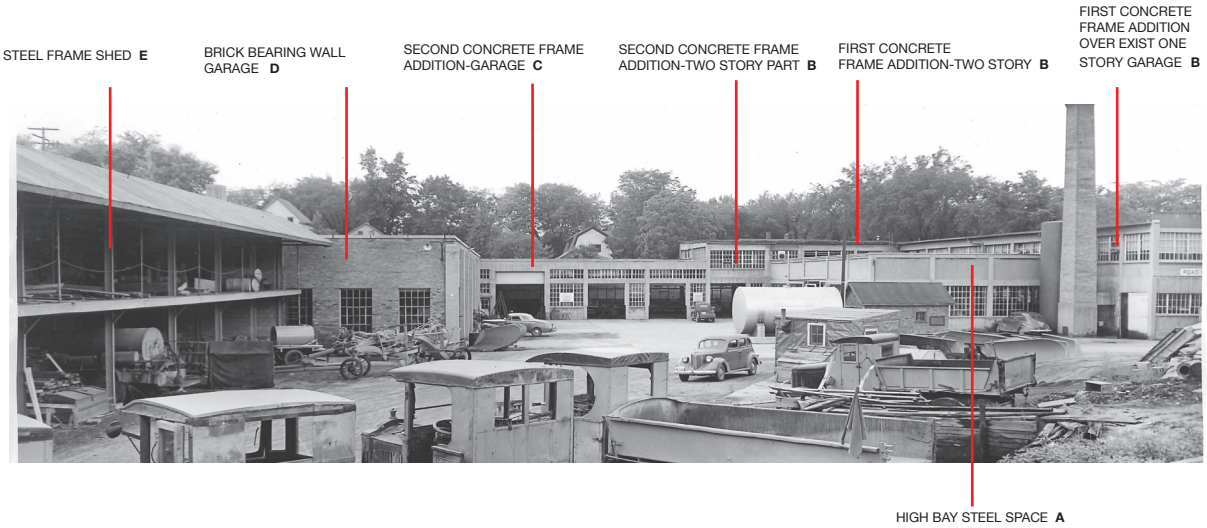


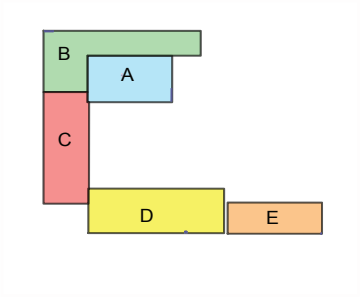
EAST ELEVATION
Scale: 1/8"=1'-0"



STRUCTURAL ISOMETRIC
NO SCALE

Isometric Structural Plan



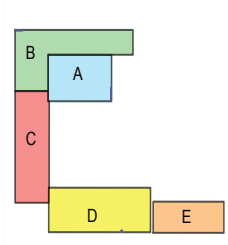


A. High bay steel space (1924-1925)
B. Concrete frame addition (1925-1926)
C. Second concrete frame addition (1928-1929)
D. Brick bearing wall garage (1933-1934)
E. Steel frame and concrete block shed (1934)

The investigation was conducted by on site research and the use of historic photographs of the original construction. Washtenaw County Road Commission records dating from 1924 were also used. No destructive investigations such as coring or drilling were done. Some building components such as below-grade foundations or parts concealed by finishes were difficult to evaluate. Each section or area of the complex was separately evaluated according to City RFP #833. Those areas of investigation are summarized below. All the buildings in the complex can be seen in the above panorama photograph from the mid 1940's.

3. Condition Assessment: Individual Structures

Area A: High Bay Space

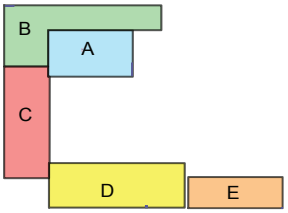


Steel pan formed roof deck. The floor system is similar.

The second floor and roof systems have reinforced concrete steel pan formed floors and roof decks. This was an innovative concrete forming system for the time. It reduced the amount of concrete needed and consequently reduced weights, allowing longer spans.

The entire exterior frame is almost completely filled with either steel window sash or overhead doors. Only on the west and south sides are the lower frames partially filled below the windows with concrete spandrel panels. The concrete frame is not parged with stucco but is painted grey The ratio of glass and door to solid wall is almost 70%, which is very high for historic standards and even very high for today's standards. The overhead doors are modern sectional doors which have replaced the original wood panel doors. Only one of the original doors remains. It is located at the center of the central phase 1 high bay space. This is a wood framed sectional door with deteriorating hardboard panels.

Phase 4: Brick Bearing Wall CWA Building.



One of the last additions is the 1933-34 brick bearing wall structure. This building was constructed under the CWA's single winter only welfare program of 1933-34. The program was proposed by Franklin D. Roosevelt on November 8, 1933 and ended on March 31, 1934. Its emphasis was upon winter employment for manual laborers. The rules set out a 30 hour work week with skilled workers in the northern zone to be paid $1.20 an hour and laborers $.50 per hour. It is not known if those were the wages paid in Washtenaw County

1933-34 Federal Civil Works Administration (CWA) funded building (2013 composite panorama).

The building has modern heavy rolled W 27" x 10" x 84# steel beams which clear span the garage. Fourteen inch deep bar joists span between the beams. The roof deck is concrete cast over a proprietary ribbed expanded metal lath system. The walls are 8" thick brick bearing walls with projecting wall pilasters located at the beam bearing points. The pilasters are a contrasting yellowish "rug faced" brick capped with sloped cast stone copings. The top approximately four feet of the walls are constructed with a darker harder faced brick of newer firing. The reason is obviously not decorative but rather one of economy, brick availability or the need for speed in acquiring brick due to the compressed construction schedule required by the CWA. It is more likely that brick from the

Buff "rug faced" brick on pilasters.

2012 photo of the 1934 CWA Welfare steel shed addition.

Phase 5: Steel Frame and Concrete Block Shed 1934

The last phase was built shortly after or concurrently with the 1933-34 Phase 3 masonry building. Like this building, it was also constructed under the Federal CWA Welfare program. It is a steel frame structure with three sides enclosed with 8" concrete block walls. The rear block wall is 8" concrete masonry and acts as lateral bracing for the steel truss frames.

The structure is a partially bolted and partially welded braced frame with a corrugated galvanized metal roof on steel purlins. Within, there is a steel frame mezzanine level storage floor on steel "H" section purlins which span between the steel truss frames. This story was mainly used for storage and is designed for fairly heavy floor loads. A centrally located single wood stairway serves the second floor.

Below this story is additional

storage. The second floor is a surprisingly interesting and potentially attractive space for numerous activities besides storage if substantial egress improvements were made. The structure is sound and could support assembly floor loading if the wood floor planking was replaced.

Interior second floor 2013 photo of the 1934 CWA Welfare steel shed addition.

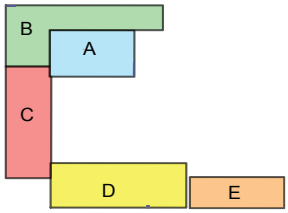
are strong Art Deco features only occasionally used on industrial buildings of the era. Looking past its condition, the facade has a very interesting composition. The concrete frame is strongly expressed as it contrasts with the brick parapet and dark industrial sash. The off-center overhead door with the painted "Road Commission" sign still partially visible is the main defining feature. This door aligns with the door in the south facade to create a "drive through".
The floors are reinforced concrete slabs supported in some areas by wide flange steel beams and in other areas by reinforced concrete beams. The roof is a reinforced concrete slab clear spanning the entire second floor.

Photo with 1925 building (on left) and 1928 addition (on right). Stucco covers the earlier building, while the later addition was left uncovered.

Parts of the frame and spandrel panels were originally parged with a rough cementitious stucco and the spandrel panels were coated with a smooth contrasting stucco. The later 1928 addition was not clad with any stucco and the original board-formed concrete frame is still visible.

At a later unknown date, the two-story office part of the building was sprayed, except for a portion of the west facade with a grey-colored hard cementitious coating probably intended to water-proof the concrete and prevent the reinforcing steel from further corroding and spalling off large parts of the frame. The effort was not successful and the steel imbedded in the concrete continued to corrode. This coating gives the building a rather cold grey look quite different than the warm buff look of the original structure shown in the photograph above right

Phase 3: Second Concrete Frame Addition.



This reinforced concrete frame was a 1928 addition to the two-story building fronting on Washington Street. It extended southward for one two-story bay and then dropped down to a lower high bay repair shop. In the southern-most end was a forge and overhead chain-hoist rail stretching along the whole repair shop length. Most of the rail still remains. This later addition has a different floor and roof structural system. The steel-framed high bay roof has a modern steel deck whose replacement date has not been documented. The deck is supported by older Warren trusses similar to those on the Phase 1 high bay space.

2012 photo of the 1928 addition showing the steel sash covered with OSB board for security.

Interior Finishes

Description
There are no interior finishes except for the small yard office mentioned above and the floor in the mezzanine. (See Structure above for a description of the floor and recommendations.)

Condition Evaluation
No evaluations are made.

Recommendations
No recommendations are made.

Mechanical Systems

Description
There are no mechanical systems.

Condition Evaluation
No recommendations are made.

Picture E1: Existing electrical service at corner of buildings A & B

415 W. WASHINGTON REFERENCE INFO - APPENDIX D

PHASE I ENVIRONMENTAL SITE ASSESSMENT

415 W. Washington Street
Ann Arbor, Michigan 48103

April 22, 2013

PHASE I ENVIRONMENTAL SITE ASSESSMENT

415 W. Washington Street
Ann Arbor, Michigan 48103

Prepared for:

City of Ann Arbor
301 E. Huron Street
P.O. Box 8647
Ann Arbor, MI 48107-8647

Prepared by:

Tetra Tech
710 Avis Drive
Ann Arbor, Michigan 48108

April 22, 2013

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FIGURES

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Figure 2 Building Schematic

Figure 3 Estimated Locations of RECs

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Appendix A Property Description

Appendix B City of Ann Arbor Zoning Map

Appendix C Environmental Database Resources (EDR) Aerial Photographs

Appendix D EDR Historical Topographic Maps

Appendix E EDR Sanborn Documentation

Appendix F EDR City Directories

Appendix G Historical Reports and Supporting Documents (on electronic copy only)

Appendix H EDR Radius Map (on electronic copy only)

Appendix I Soil Map

Appendix J Flood Plain Map (from Allen Creek Task Force Document)

Appendix K Photographs

Appendix L Qualifications of Environmental Professional

EXECUTIVE SUMMARY

The City of Ann Arbor retained Tetra Tech to perform a Phase I Environmental Site Assessment (ESA) for the City of Ann Arbor ("the City") concerning the property located at 415 W. Washington Street (subject property) as part of the due diligence process. This Phase I ESA was performed in accordance with the scope and limitations specified in the American Society for Testing and Materials (ASTM) Standard E 1527-05. This Phase I ESA has been performed to identify Recognized Environmental Conditions (RECs) at the subject property.

RECs are defined in the ASTM Standard E 1527-05 as the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into the structures on the property or into the ground, groundwater, or surface water for the property. The term includes hazardous substances or petroleum products, even under conditions in compliance with current environmental regulations.

The Phase I ESA for the subject property has identified 8 RECs for the subject property based on available information. RECs include:

1. Chemical Storage Area (two 55-gallon drums of xylene, four unmarked 55-gallon drums, various chemicals, and staining) located in the South Garage;
2. Soil and groundwater beneath the former 10,000 gallon fuel oil AST in the northern portion of the subject property;
3. Soil and groundwater beneath the former 10,000 gallon fuel oil AST in the northeastern portion of the subject property;
4. Potential soil and groundwater impacts beneath the two former 6,000 gallon unleaded gasoline and diesel USTs (tank farm);
5. Soil beneath the salt storage area in the South Garage;
6. Soil beneath the three full fuel tanks in the South Garage;

In addition, the following items which are not RECs but may warrant further consideration were identified in completing this Phase I ESA:

7. Location of AH17-1 soil sample, based on FOIA documents;

8. Location of AH17-2 soil sample, based on FOIA documents;
9. Allen Creek Drain, a listed Part 201 site, located beneath the subject property;
10. Labeled ‘asbestos containing’ wrapped pipes observed within the building;
11. The Eaton Corporation property located south of the subject property; and
12. The U of M Argus Building open leaking underground storage tank (LUST) site and state hazardous waste site (SHWS) located southwest of the subject property.

Historical practices and previously remediated areas include:

13. The former oil house located southeast of the North Garage;
14. The former tar storage area located on the northeastern portion of the property;
15. The former coal storage area located on the northeastern and central portion of the property.

1. INTRODUCTION

1.1 General Site Description

The City of Ann Arbor retained Tetra Tech to perform a Phase I Environmental Site Assessment (ESA) of the property located at 415 W. Washington Street, Ann Arbor, Michigan 48103, herein referred to as the "subject property". The Tax ID numbers for the site are 09-09-29-211-003, 09-09-29-211-017, 09-09-29-211-018 which are comprised of a 2.52 acre lot (**Appendix A**). Generally, the site lies north of W. Liberty Street, west of the Ann Arbor Railroad (AARR) and S. 1st Street, east of 3rd Street and south of W. Washington Street. **Figure 1** depicts the site location and features on the subject property. Groundwater flow direction at the site is assumed to be to the northeast, towards the Huron River.

1.2 Objectives

The objectives of the Phase I ESA for the subject property are to:

- Identify and evaluate environmental conditions at the subject property; and
- Provide an interpretation on the nature of environmental risk or liability that may be present.

This assessment has been completed in general conformance with the American Society for Testing and Materials (ASTM) Standard E 1527-05 – *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, as outlined in our proposal. The primary focus of the Phase I ESA process is to identify recognized environmental conditions (RECs) and is limited to the identification of RECs within the scope of the ASTM standard. As defined by ASTM, REC means:

> "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of release of any hazardous substance or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies."

This Phase I ESA was completed within and outside of existing structures and features including the north, west, and south garages, first and second floor offices, boiler room, parking

lot, and a visual inspection of the open sheds. This Phase I ESA includes a review of historical information regarding activities on the subject property; review of readily available information concerning the subject property and nearby properties of environmental concern. Phase I ESAs do not include the following:

- Subsurface investigations or inspections within walls or ceilings of buildings;
- Sampling or detailed surveys for lead-based paint, lead in pipes or within drinking water supplies;
- Polychlorinated biphenyls (PCB's) in paint, fluorescent light ballasts, transformers, circuit breakers and other electrical equipment;
- Radon gas or radioactivity;
- Sampling or detailed surveys for Suspected Asbestos Containing Materials; and
- Presence or delineation of wetlands.

A title search was not completed for this property. The findings, conclusions, and interpretations are subject to modification if subsequent information is discovered by Tetra Tech or provided by others. The findings of this report are time-specific and are only representative of site conditions, as they existed at the time of the site visit.

1.3 Description and Current Uses of Subject Property and Surrounding Area

The subject property is zoned as Public Land and Downtown Interface (**Appendix B**). Surrounding properties are located in residentially and commercially zoned areas. A paved entrance drive with gates on the south and north sides of the property provide vehicle access, and leads to an unpaved parking area surrounded by a fence to the east, west and south. Buildings remain on the subject property (**Figure 1**). The U-shaped buildings sit on the west side of the property. The buildings were historically used as a maintenance garage, radio and lawn mower repair shop, carpentry shop, storage garages, and open sheds for the City of Ann Arbor Parks and Recreation Department. Different sections of the U-shaped building were added over time, but the current configuration has been in place since at least 1937 (**Appendix C**). Today, the U-shaped buildings are vacant however portions of the buildings are used to store City of Ann Arbor and Republic Parking Services (RPS) materials. Inside the building, there are miscellaneous paint cans, drums and buckets of flooring epoxy and various chemicals, two skid steers, pallets of road salt, a dumpster, one inaccessible storage area, and refuse. The subject property is fenced off behind the structure on the west end of the site. On the south end of the property, a narrow parking area traverses north/south and connects to the main parking

lot. The large parking lot located on the subject property is currently being leased by the Downtown Development Authority who contracts parking operations to RPS.

Southwest of the subject property is the Liberty Car Wash. North of the subject property is the Ann Arbor YMCA. The AARR bounds the site on the east. Residential properties line W. Washington, west of the subject property. To the east, commercial properties and additional parking lots dominate the area.

2. PAST USES OF SUBJECT PROPERTY AND SURROUNDING AREAS

The following sections present information regarding the past history of the subject property and the surrounding area. Historical information for this site was obtained from aerial photographs, a City Directory database search, Freedom of Information Act (FOIA) documents, and available City of Ann Arbor records.

2.1 Previous Property Owners

The Ann Arbor Electric Light Company, Ann Arbor Fruit Works, Allmendinger and Schneider Cooper Shop, Ann Arbor Organ Company's Lumber Yard, Michigan Milling Co. Bean Warehouse, J.J. Sauer Coal and Lumber Yard, Washtenaw County Road Commission, and City of Ann Arbor have occupied the subject property from 1888 to present.

2.2 Aerial Photography Interpretation

Aerial photographs were reviewed from the years 1937, 1940, 1949, 1955, 1961, 1967, 1978, 1985, 1992, 2000, 2005, and 2006. A satellite image was reviewed from 2012. All aerial photographs are provided in **Appendix C**. The scale and source for each aerial are included in the appendix.

The 1937 aerial photograph indicates that residential land surrounds the subject property with commercial land including several structures east and immediately north of the subject property. Downtown Ann Arbor is east of the property. The AARR runs adjacent to the subject property. The same building configuration appears in the 1937 aerial photograph as the current configuration. Residential buildings surround the subject property to the west, south and further north. A small structure is visible in the central portion of the property in the 1931 and 1937 aerials that may coincide with an aboveground storage tank (AST) and "oil house" identified in the Sanborn maps (see Section 2.4).

Aerial photographs from 1940, 1949, 1955, and 1961 suggest limited change within the subject property and surrounding area. The 1955 aerial appears to have a parking area cleared on the southeastern property boundary, accessible from W. Liberty Street. A building addition is evident on the adjacent property south of the subject property between 1961 and 1967. Multiple vehicles appear to be parked on the subject property beginning in 1955. There are no notable changes in the 1978, 1985, and 1992 aerial photographs. In the 2000 aerial photograph a

possible AST and “oil house” in the central portion of the subject property are no longer apparent.

Between 2000 and 2005, the Ann Arbor YMCA was constructed north of the subject property. The 2005 and 2006 aerial photographs and the satellite image from 2012 illustrate similar land use as today.

2.3 Historical Topographic Map Review

Topographic maps spanning the years 1904 to 1983 were reviewed. The topographic maps are included in this report as **Appendix D**. The scale, source, and date are provided on each topographic map.

The 1904 Ann Arbor topographic map is at a 1:125,000 scale and depicts the general location of the subject property in the northwest corner of the city of Ann Arbor, southwest of the Huron River. Regional land features include a general slope to the north, corresponding to the location of the Huron River, although the subject property is primarily flat. Allen Creek flows north into the Huron River, and through the middle of the subject property. The 1906 1:62,500 scale Dexter quadrangle map provides a topographic view of western Ann Arbor. The 1965 1:24,000 scale Ann Arbor West quadrangle map provides a more focused view of the subject property and surrounding area. There are no structures identified on the subject property, although aerial photographs depict structures dating back to the earliest flight year (1937). The slight northeastern slope of the land surface can be seen. The 1975, and 1983 Ann Arbor West topographic maps are similar to the 1965 map with no significant differences.

2.4 Sanborn Insurance Map Search

Sanborn maps from 1888 to 1972 were reviewed for the subject property. Sanborn maps are provided in **Appendix E**. The Sanborn map from 1888 identifies three buildings on the subject property, with Allen Creek flowing northwest through the center of the property. The Ann Arbor Light Electric Company resides in a building on the north side of the property along W. Washington Street. Ann Arbor Fruit Works and a Cooper Shop occupy the buildings south and west of Allen Creek. The Ann Arbor Central Mills is located on the adjacent property, east of the AARR with a rail spur to the northern portion of the property. Allmendinger Piano & Organ Company is located northeast of the subject property, on the corner of W. Washington and S. 1st Street. Other manufacturing and coal storage are located north of the subject property.

Residential properties line W. Liberty Street and S. 1st Street including the southern portion of the subject property leading to W. Liberty Street.

In the 1892 Sanborn map, the Ann Arbor Fruit & Vinegar Company and the Ann Arbor Electric Light Company have expanded their buildings. A cider mill and vinegar tanks have been added to the Ann Arbor Fruit & Vinegar Company. A coal storage room is identified within the Ann Arbor Electric Light Company. The Allmendinger and Schneider Cooper Shop occupy the northwest portion of the site and a rail spur from the AARR stretches across the property to the Cooper Shop, south of Allen Creek. The Allmendinger Piano & Organ Company is still located northeast of the subject property and Allmendinger & Schneider Central Mills appears to have taken over a portion of the former Ann Arbor Central Mills, east of the AARR. Robert Hunter Machine Shop Foundry and Heinzmann & Laubengayer Elevator and Feed Mill are located north of the subject property

In the 1899 Sanborn map, the Ann Arbor Organ Company's Lumber Yard is located on the subject property. Other site conditions remain the same. Residential parcels appear north of the subject property and the only commercial business is the Ann Arbor Fluff Rug Factory. Coal Storage is replaced with a wood shed and the Ann Arbor Chicory Company has replaced the elevator and feed mill.

The 1908 Sanborn map indicates that the Ann Arbor Electric Light Company has become the Michigan Milling Co. Bean Warehouse. The Ann Arbor Organ Company Lumber Yard has expanded. The Ann Arbor Fruit & Vinegar Company still maintains buildings onsite; however they are identified as 'not in operation'. The Cooper Shop remains next to the lumber yard in the northwest; however the AARR rail spur to the Cooper Shop is absent. Another rail spur traverses north and then northwest to the Michigan Milling Co. Bean Warehouse on the north side of Allen Creek. A smaller unidentified structure is located south of the lumber yard. The Ann Arbor Organ Company and elevator and feed mill remain northeast of the subject property.

Allen Creek is no longer a surface feature in the 1916 Sanborn map. The Ann Arbor Fruit & Vinegar Company has become J.J. Sauer's Coal & Lumber Yard. Coal and lumber is stored on the along the AARR rail spur. A driveway connecting the subject property to W. Liberty Street is observed. The Ann Arbor Organ Company Lumber Yard is not identified although the previously identified 'storage stock' for the lumber has become a flour and feed warehouse.

The cooper shop and Michigan Milling Co. Bean Warehouse remain onsite. The Ann Arbor Organ Company on the corner of W. Washington and 1st Street is now The Superior Mfg. Co. Plant; Automobile Windshield Assembling. The elevator and feed mill is absent; however the Artificial Ice Company is identified. The residential area north of the subject property has expanded.

In the 1925 Sanborn map, the Washtenaw County Road Commission now occupies the northwest corner of the property that was previously the Cooper Shop. An 'oil house' is identified just southeast of the main Road Commission building and numerous smaller buildings are identified. The remaining site features are similar to the 1916 Sanborn map onsite and adjacent to the east. The Superior Mfg. Co. Plant is now the Motor Product Corporation, still manufacturing windshields. The Artificial Ice Company remains. The Ann Arbor Fluff Rug Company located north of residential properties and north of the subject property has been replaced with an expanded building for the American Broach & Machine Company. Residential area remains west and south of the subject property.

The 1931 Sanborn map indicates the expansion of the Washtenaw County Road Commission across the subject property with the exception of the southern parcel facing W. Liberty Street. Two 10,000 gallon aboveground storage tanks (ASTs) are located on the subject property. One is identified as containing fuel oil; the other does not identify the contents. A tar storage garage, four road machinery storage garages, highway equipment and gravel storage, a cement post factory, carpentry shop, machine repair shop, and offices occupy the subject property. A grocery store and a biological supplies warehouse occupy the property directly to the east of the subject property. A filling station occupies the property on the corner of S. 1st Street and W. Liberty Street. The Motor Products Corporation is vacant northeast of the subject property. Directly north, an auto parking lot with two 20,000 gallon gasoline underground storage tanks (USTs) has replaced residential homes.

In the 1948 Sanborn map the Washtenaw County Road Commission expanded their main building to include a road machinery storage garage and an adjacent building for unknown use. The current main building configuration mimics what is onsite today. The tar storage garage, previous four machine storage garages, and highway equipment and gravel storage are no longer on the subject property. The oil house, two ASTs and cement post warehouse remain onsite. A farm equipment and building supplies shop occupies the former grocery store on the

corner of W. Washington and S. 1st Streets. Directly to the east of the subject property on S. 1st Street is a stamping and machine shop, sheet metal shop, and hand laundry shop. A machine shop occupies the property north of the subject property in the former auto parking lot.

In the 1972 Sanborn map, much of the site conditions remain the same. A fuel oil tank is identified on the northeastern portion of the subject property. The residence previously located on the southern portion of the site no longer exists and the parcel is vacant. An auto wash is located adjacent and to the west of the vacant parcel. The AARR rail spur that enters the property is still evident on the map. The former farm equipment and building supplies shop on the corner of W. Washington and S. 1st Street is now the Kiwanis Activities Center. A motorcycle sales and service shop occupies the property that was once the sheet metal and hand laundry shops. The remaining adjacent properties have similar land use as the 1948 Sanborn, although owners have changed.

2.5 City Directories

City directories were reviewed for the years spanning 1915 to 2012, including business directories and telephone directories. The City Directory Report is included in **Appendix F** the source of which is Polk's City Directory. The first listing for 415 W. Washington is in 1915 as the Michigan Milling Company and Cooper Shop. From 1915 to 2007 415 W. Washington was listed as the following:

- Michigan Milling Company, Cooper Shop;
- Washtenaw County Good Roads;
- Washtenaw County Road Commissioners;
- WPA Local Area of Monroe and Washtenaw Counties; Washtenaw County Road Commission;
- Washtenaw County Road Commission; Board of Park Trustees;
- City Board of Parks and Recreation, City Forestry Division, City Parking and Traffic Engineering Division, Huron River Watershed Council, Traffic signs, Signals and Radios;
- City Department of Parks and Recreation;
- City Traffic Control Division;
- City Department of Transportation; and
- Fairview Cemetery and Park Maintenance offices.

According to the Sanborn Maps, the area that occupies 415 W. Washington today included 321, 325, 401, 403, and 411 W. Washington, and 314 W. Liberty Street. From 1915 to 2012, surrounding properties are listed as private residences. Following is a summary of the previous addresses associated with the subject property, according to the City Directory:

Address	Use	Years Listed
321 W. Washington Street	Michigan Milling Company; Feed Warehouse Tractor storage	1915-1927
401 W. Washington Street	Michigan Milling Co., yard	1915-1920

Following is a summary of current nearby addresses and their listed use:

Address	Use	Years Listed
408 W. Washington	American Case Company, Performance Network Theatre Productions, Ann Arbor Civic Theatre	1978-2001
412 W. Washington	Private residence, Barbara Neri Dance Studio	1915-1992
417 W. Washington	Private residence, Commercial Trucking Co., Vacant	1915-1927
421 W. Washington	Private residence, Student Housing, vacant	1915-2012
423 W. Washington	Private residence, Not verified	1915-2012

2.6 Washtenaw County Services Website

The parcel ID number and current owner information were obtained for the subject property (**Appendix A**). Knowledgeable contacts within the City of Ann Arbor were also contacted for other pertinent information regarding past uses of the subject property. These interviews are included in Sections 5 and 6.

2.7 Freedom of Information Act (FOIA) Review

The following information was reviewed and can be located in **Appendix G**.

1. *Environmental Property Assessments for Hawkins, 415 W. Washington Street and Municipal Garage Properties* (1990 Environmental Property Assessment) dated March 5, 1990 and submitted to the City of Ann Arbor Parks and Recreation Department by Environmental Control Technology Corporation (Encotec) of Ann Arbor.

2. *Parks and Recreation Garage Remediation Systems Operation and Maintenance Progress Report* dated February 20, 2001 and submitted to the City of Ann Arbor Public Services Department by NTH Consultants, Ltd (NTH).
3. Michigan Department of Environmental Quality (MDEQ) Leaking Underground Storage Tank (LUST) Facilities List, reviewed September 14, 2012.
4. *Suspected Release from UST at 415 W. Washington, City of Ann Arbor*, dated September 21, 1989 and submitted to Michigan Department of Natural Resources (MDNR) by The Traverse Group, Inc. (TGI).
5. *City of Ann Arbor 415 W. Washington Tank Removal Site Initial Abatement Measures (20 Day Report)*, dated January 9, 1990 and submitted to the MDNR by TGI.
6. *City of Ann Arbor 20 Day Reports, UST Removal Sites*, dated January 19, 1990 and submitted to the MDNR by TGI.
7. *20 Day Report – Initial Abatement Measures City of Ann Arbor Parks and Recreation Building 415 West Washington Street Ann Arbor, Michigan 48103, dated March 13, 1992 and submitted to* MDNR Environmental Response Division (ERD) by TGI.
8. *Tank Removal and Soil Excavation City of Ann Arbor Parks and Recreation Building 415 West Washington Street Ann Arbor, Michigan 48103, dated March 13, 1992 and submitted to* Michigan Department of Natural Resources MDNR ERD by TGI.
9. *45 Day Report The City of Ann Arbor Parks and Recreation Garage 415 West Washington Street Ann Arbor, Michigan*, dated April 17, 1992 and submitted to submitted to MDNR ERD by TGI.
10. *Site Investigation Report For An Underground Storage Tank Release The City of Ann Arbor Parks and Recreation Garage 415 West Washington Street Ann Arbor*, Michigan, dated April 15, 1994 and submitted to MDNR ERD by TGI.
11. *Feasibility Study City of Ann Arbor Parks and Recreation Garage 415 West Washington Street,* dated April 15, 1994 and submitted to MDNR ERD by TGI.
12. *Corrective Action Plan Park & Recreation Garage City of Ann Arbor 415 West Washington Street Ann Arbor, Michigan,* dated March 29, 1996 submitted by NTH to City of Ann Arbor Engineering Division.
13. Michigan State Police Fire Marshall Division Release forms for leaks in the MDEQ LUST database.

Review of one document provided by the City of Ann Arbor, *Environmental Property Assessments for Hawkins, 415 W. Washington Street and Municipal Garage Properties* (*1990*

Environmental Property Assessment) (Reference 1) indicates four soil borings were completed onsite in 1989. Significant soil staining was present as well as an 'oil and/or solvent odor'. Groundwater sampling indicated that the groundwater was not impacted with organic compounds. Various metal concentrations were reported as suspect contamination in each boring. However, a map of these locations is not provided.

Two existing USTs and ASTs were identified onsite. One AST was located on the east property boundary, adjacent to West Washington Street and the AARR. The previous contents or use of the AST are unknown. The second AST was located at the eastern end of the north building complex onsite and was suspected to have held fuel oil for building heat systems. Both ASTs were believed to be empty in 1989. No information was provided on the location of the USTs and according to this document no information was available on their contents.

Review of the MDEQ LUST database (Reference 3) indicates that there were three separate releases documented at the site:

- C-0549-89 reported 09/19/89 of an unknown substance.
- C-1222-89 reported 12/20/89 of an unknown substance.
- C-0371-92 reported 03/06/92 for a gasoline release.

A FOIA request was submitted to the MDEQ and a file review was completed on October 2, 2012. Each of the releases identified above are described in detail from the reports obtained during the file review.

<u>Unknown substance releases (release number C-0549-89 reported 09/19/89 and C-1222-89 reported 12/20/89)</u>

The 1989 releases appear to be from one 1,000-gallon diesel UST. The September 21, 1989 *Suspected Release from UST at 415 W. Washington* letter from TGI to the MDNR (Reference 4) indicates that a 1,000 gallon diesel UST failed a tank tightness test on September 18, 1989. A suspected leak rate of 0.253 gallons/hour was reported, however the tank tester believed an air pocket in the tank or underground piping could have been responsible for failing the tightness test. The suspected release was reported to the State and local Fire Marshall on September 19, 1989. The *Michigan State Police Fire Marshall Suspected Release Form* dated September 19, 1989 is included in **Appendix G**.

The tank was taken out of service and according to the January 9, 1990 *Initial Abatement Measures (20 Day Report)* (Reference 5) the diesel tank was removed from the ground on December 19, 1989. A gasoline odor was noted during removal. The tank was cleaned, rendered useless with a hole cut into the side and transported to a disposal facility. The presence of product was reported to the Michigan Fire Marshall on December 20, 1989. Soil samples were collected from the excavation pit and submitted for analysis of benzene, toluene, ethylbenzene and xylenes (BTEX). The sample from the north end measured in the field at a concentration of 100 parts per million (ppm) with an HNU meter and the sample from the south end near the tank fill pipe screened at 110 ppm. Although the soil appeared discolored, analytical results indicated that BTEX was not detected in the soil. Groundwater and free product were not encountered during the excavation. The site was backfilled to original grade.

Gasoline Release (C-0371-92 reported 03/06/92)

On March 6, 1992 an unleaded gasoline release from an onsite steel 6,000 gallon UST was reported to the Michigan State Police Fire Marshall Division. According to the *20 Day Report – Initial Abatement Measures* dated March 13, 1992 (Reference 7) the unleaded gasoline UST system failed a tank tightness test and hydrocarbon odors were observed. The *45 Day Report* (Reference 9) dated April 17, 1992 indicates that the leaking 6,000 gallon unleaded gasoline UST had a corroded product line, which caused both soil and groundwater impacts. Both the gasoline UST and 6,000 gallon diesel UST, located parallel to each other and 3-feet apart, were emptied of contents on March 9, 1992. The tanks were triple rinsed on March 19, 1992 and removed from the ground the next day.

During the tank excavations, gasoline saturated soil and free product were encountered on the south side of the gasoline UST. The excavation was postponed and the local Fire Marshall was contacted. Under the Fire Marshall's instructions, the free product (approximately five to ten gallons) was soaked up with the overburdened soil. On March 20, 1992, free product was no longer pooling and the excavation resumed. While removing the gasoline UST, free product began pooling again and the Fire Marshal was again contacted. The Fire Marshall poured emulsifier onto the pooling product and the second UST was removed. After the removal of both tanks, approximately 1,200 gallons of light non-aqueous phase liquids (LNAPL) and water were pumped out of the excavation using a vacuum pump. LNAPL continued to enter the excavation and an additional 2,300 gallons of LNAPL and water was pumped out. A total of 198 cubic yards of soil was removed from the site and disposed of at the Ann Arbor Landfill and 192

cubic yards of concrete were landfilled at Belleville, Michigan. Water samples were collected from the water in the excavation for waste characterization. The laboratory analytical results reported total BTEX constituents at 58.9 ppm.

Three monitoring wells were installed (MW-1 through MW-3). Monitoring wells MW-2 and MW-3 had a sheen on the water surface and MW-1 had approximately 33 inches of LNAPL present after installation and development. On April 13, 1992 the excavation was backfilled and a 12-inch diameter LNAPL recovery well was installed eight feet southwest of MW-1.

The April 15, 1994 *Site Investigation Report For An Underground Storage Tank Release* summarizes the site investigation work that took place following the *45 Day Report* (Reference 10). In April and May 1992, 17 gallons of LNAPL were recovered and a more permanent recovery system was installed. A skimmer separated and pumped approximately 40 gallons of LNAPL to an AST.

Between June 1992 and November 1993 eight additional monitoring wells and seventeen soil borings were completed in order to delineate the extent of hydrocarbon-affected resources onsite and characterize the site geology. According to this report, current soil and groundwater contamination boundaries were established horizontally and vertically. However, soil detections reported from Auger Holes AH17-1 and AH17-2 were not delineated. Auger Hole AH17-1 was located on the northeastern portion of the property, south of the former AST and Auger Hole AH17-2 was located off the northeast corner of the Pole Barn (Open Sheds) and adjacent to Allen Creek. These locations were believed to be unrelated to the former USTs; however polynuclear aromatic hydrocarbons (PNAs) below the Type B Criteria were detected in both locations. Total PNAs were detected in AH17-1 (2-4 feet) at 930 parts per billion (ppb), AH17-1 (4-6 feet) at 1,500 ppb and AH17-2 (2-4 feet) at 7,390 ppb. Individual PNA parameters were not reported in the document and cannot be compared to current criteria.

The April 15, 1994 *Feasibility Study* (Reference 11) outlines possible remedial action alternatives TGI proposed for the subject property. The March 29, 1996 *Corrective Action Plan* (Reference 12), summarizes the pilot testing completed to evaluate the possible remediation technologies for the site. Based on the results of the investigation and pilot test the city decided to use pump and treat, soil vapor extraction and air sparging to remediate impacts. The cover

letter to the *Corrective Action Plan* indicates 3,200 gallons of LNAPL and water had been recovered to date.

According to the information provided in the City's request for proposal (RFP) and the provided 2001 *Parks and Recreation Garage Remediation Systems Operation and Maintenance Report* (Reference 2), the remediation system was installed in 1997 to remove the contamination from soil and groundwater. Groundwater wells were routinely sampled from 1997 to June 2003 for BTEX and PNAs. In order to reach site closure, the MDEQ required at least six consecutive months of data below 5 parts per billion (residential cleanup standards) for benzene. During this sampling timeframe, two of these wells (MW-6 and MW-11) periodically had detections of benzene which prohibited site closure. The remediation system was turned off in December 2002 before closure was obtained.

2.8 Part 201 Database Review

The MDEQ Part 201 Database was reviewed to determine if sites are located adjacent to the subject property. Allen Creek, which traverses the property within the stormwater drain is a Part 201 site for BTEX contamination. The MDEQ Part 201 Database indicates that an interim response is in progress for the site listed on June 18, 2004 at 912 N. Main Street (presumably the address where Allen Creek discharges to the Huron River), which is downgradient of the subject property. Records identifying the presence, extent and origin of BTEX contamination in Allen Creek were not available for this Phase I ESA. A comprehensive file review or additional onsite sampling is needed to determine if these sites are RECs for the subject property.

The U of M Argus Building (400 4th Street), Eaton Corporation (315 S. 1st Street), and Ann Arbor YMCA (396-424 W. Washington Street) are also listed on the MDEQ Part 201 Database. The MDEQ Part 201 Database indicates that an interim response has been conducted for the Eaton Corporation, an evaluation has been conducted for the Ann Arbor YMCA property, and the U of M Argus Building is listed as a MDEQ Part 213 site. These will be discussed in Section 3.

3. ENVIRONMENTAL RECORDS REVIEW

Environmental Data Resources (EDR), Inc., conducted a thorough regulatory review of all available State of Michigan and Federal lists of area sites of environmental concern on January 14, 2013. The environmental database searches are summarized below. EDR's complete report is provided as **Appendix H**. The search radii for each applicable database are per the ASTM Standard. The source and date of the government version of each database is provided in the Data Currency Tracking section of EDR's report. Each site listed in these databases has been evaluated to assess the likelihood of impacting the subject property; however, the objective of this Phase I ESA is to ascertain whether the use of the subject property by its tenants has impacted the subject property and whether adjacent properties have the potential to impact the subject property. Information provided in this section is from the EDR report unless otherwise stated.

3.1 Subject Property Database Hits

The subject property was identified in 6 databases on the EDR report:

- Resource Conservation and Recovery Act Non-Generator (RCRA-NonGen); a database that indicates that the subject property does not generate hazardous waste.
- Facility Index System (FINDS); a database that contains facility information about various compliance reporting requirements for the subject property.
- Waste Data System (WDS); a database that tracks activities at facilities regulated by the Solid Waste, Scrap Tire, Hazardous Waste and Liquid Industrial Waste programs.
- LUST; database that indicates a release has occurred from a UST at the subject property.
- Underground Storage Tank (UST); database that indicates registered USTs are located on the subject property.
- Permit and Emissions Inventory Data (AIRS – Aerometric Information Retrieval System); database that indicates the subject property is included in this inventory for air quality data.

3.2 National Priorities List

The subject property is not included on the National Priorities List (NPL), a list compiled by the U.S. Environmental Protection Agency (U.S. EPA) of contaminated sites, otherwise known as Superfund, under the Comprehensive Environmental Response, Compensation, and Liability

Act (CERCLA), to record risks to human health and the environment associated with contaminated water, soils or air. A review of the database identified no NPL sites within one mile of the subject property.

3.3 Proposed National Priorities List

The subject property is not listed on the Proposed National Priorities List (PNPL) database. This database lists properties proposed for the NPL. No PNPL sites are listed within one mile of the subject property.

3.4 Delisted National Priorities List

The subject property is not listed on the Delisted National Priorities List (DNPL) database. This database lists properties that were once on the National Priorities List but have since been delisted. No DNPL sites are listed within one mile of the subject property.

3.5 National Priorities List Liens

The subject property is not listed on the Federal Superfund Liens database.

3.6 Comprehensive Environmental Response, Compensation, and Liability Information System

The subject property does not appear on the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) database, a listing of known and suspected uncontrolled or abandoned hazardous waste sites throughout the nation, maintained and compiled by the U.S. EPA, Office of Solid Waste and Emergency Response. CERCLIS contains all possible, proposed, and confirmed NPL sites. A review of the database identified one CERCLA site within one-half mile of the subject property. Armen cleaners (603 South Ashley) is located cross gradient of the subject property, therefore it does not pose a REC.

3.7 Comprehensive Environmental Response, Compensations, and Liability Information System, No Further Action Planned

The subject property is not listed on the CERCLIS-No Further Remedial Action Planned (NFRAP) database, a listing of sites that have been removed from the CERCLIS database. NFRAP are sites where contamination was not found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require NPL consideration. The database search listed one site within one-half mile of the subject property. Armen Cleaners (603 S. Ashley) is located cross gradient of the subject property. CERCLIS-NFRAP sites have been removed and archived from the inventory of CERCLIS sites. Therefore, this site does not pose a risk to the subject property.

3.8 Corrective Action Report

The U.S. EPA maintains a Corrective Action (CORRACTS) database of RCRA facilities, which are undergoing "corrective action." The subject property was not listed in the database and no sites were identified within one mile of the subject property.

3.9 Resource Conservation and Recovery Act – Treatment, Storage and Disposal

The subject property does not appear on the Resource Conservation and Recovery Act (RCRA)-Treatment, Storage and Disposal (TSD), which includes information on sites that generate hazardous wastes and those which operate TSD facilities, as defined by RCRA. The RCRA database did not identify any RCRA-TSD sites within one-half mile of the subject property.

3.10 Resource Conservation and Recovery Act Generator

The RCRA – Conditionally Exempt Large and Small Quantity Generators (CELQG and CESQG, respectively) contains information on hazardous waste handlers regulated by the U.S. EPA under RCRA, RCRA notifiers, transporters, and formerly regulated RCRA sites. CESQGs generate less than 100 kilograms (kg) of hazardous waste or less than 1 kg of acutely hazardous waste per month. There were eight CESQGs identified within one-quarter mile of the subject property.

Property Name	Address
GT Products Inc. (Site name: Eaton Corporation)	315 S. 1st St.
Morningside Ann Arbor LLC (Site name: Eaton Corporation)	305 W. Liberty St.
Ross-Beakes Collision	314 W. Ann St.
Sir Speedy	350 S. Main St.
University of Michigan	400 S. 4th St.
Emre Fuel Inc.	402 S. Main St.
National City Bank	101 S. Main St.
Sheesh[1]	207 N. Main St.

1. Restaurant no longer in business as of August 22, 2011.

Three violations were reported for GT Products Inc. in 1998 and 2003. Compliance was achieved for all three violations. No violations were found for the remaining RCRA-CESQGs.

3.11 Emergency Response Notification System

The Emergency Response Notification System (ERNS) contains information on specific notification of release of oil and hazardous substances into the environment. The search radius includes only the subject property and it is not listed in the database.

3.12 State Hazardous Waste Sites

The State Hazardous Waste Site (SHWS) database contains information on sites that are the state equivalent of CERCLIS sites. These sites may or may not be listed in the CERCLIS database. These are priority sites planned for cleanup using State funds. The subject property was not listed in the database. Nine properties were identified in the SHWS database search. Each of the properties is located within one mile of the subject property. Regional groundwater flow is assumed to be to the northeast, towards the Huron River.

Property Name	Address	Direction and Distance from Subject Property	Potential REC?
Ann Arbor YMCA (Former site use history)	396-424 W. Washington	N 0-$^1/_8$ mile	No
815 Wildt St.	815 Wildt St.	NNE ½-1 mile	No
H and K Campus Properties	212-216 S. State St.	E ½-1 mile	No
Eaton Corporation	315 S. 1st St.	SSE 0 - $^1/_8$ mile	Yes
U of M Argus Building	400 4th St.	SW $^1/_8$ -¼ mile	Yes
Armen Cleaners	630 S. Ashley	SSE ¼ - ½ mile	No
Sheffield Pharmaceuticals	912 N. Main St.	NNE ½ - 1 mile	No
MichCon	841 Broadway St.	NE ½ – 1 mile	No
Ann Arbor Art Train[1]	1100 N. Main St.	NNE ½ - 1 mile	No

1. The address corresponds with the former Lansky's Junkyard.

Six of the above SHWS sites do not pose a potential REC to the subject property. Based on the direction of groundwater flow, the U of M Argus Building and Eaton Corporation properties could pose a risk. Armen Cleaners is located cross gradient of the subject property, so this property does not pose a risk.

3.13 Solid Waste Facilities Database

The Solid Waste Facilities Database (SWF/LF) lists solid waste disposal facilities or landfills in Michigan. These may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D, Section 4004 criteria for solid waste landfills or disposal sites. The subject property

was not listed in the database and no sites were identified within one mile of the subject property.

3.14 Leaking Underground Storage Tank

The LUST list provides information on known leaking underground storage tanks in the State. In addition to the subject property, twenty-five LUST sites were identified in the database search within one-half mile of the subject property. Below is a table summarizing the LUST sites within one-half mile of the subject property.

Property Name	Address	Release Date	Substance Released	Release Status
Beakes St. Service Station	101 Beakes St.	9/27/1989	Not reported	Closed
Braum Family Agency	601 S. Main St.	4/26/1994	Gasoline	Open
De Long BBQ Pit	314 Detroit St.	3/14/2001	Other	Closed
University Fuel Mart	300 N. Main St.	3/3/1992	Gasoline	Closed
Bill Muncy's Service	423 Miller Ave.	2/2/1999	Unknown	Closed
City of Ann Arbor Fire Department	111 N. 5th Ave.	9/10/1992	Diesel	Closed
Ashley Terrance Development	208 W. Huron St.	7/24/2006	Gasoline, diesel	Closed
City of Ann Arbor	100 N. 5th Ave.	9/28/2011	Diesel	Closed
Comerica Bank	300 E. Huron St.	10/8/1991	Not reported	Closed
Comerica Bank	312-314 E. Huron St.	10/9/1991	Unknown	Closed
Ann Arbor Co.	324 E. Huron St.	11/20/1991	Unknown	Closed
WCP Investments Partnership	117 N. 1st St.	3/19/1991	Unknown	Closed
Illis Auto Service	401 W Huron St.	10/6/1988	Not reported	Closed
Budget Rent A Car	200 S. Ashley St.	4/28/1993	Gasoline	Closed
Campus Auto	202 S. Division St.	9/22/1994	Gasoline	Closed
Ann Arbor Implement Co.	210 S. 1st St.	6/11/1993	Gasoline	Closed
Japanese Auto	563 S. Main St.	01/04/2000	Used Oil	Open
Liberty Street[1]	221 W. Liberty	7/13/2004	Not reported	Open

C.B. Development	220 Felch St.	5/26/1992 5/28/1992 6/4/1992	Diesel Diesel Gasoline	Closed Closed Closed
Dale Krull Construction	221 Felch St.	5/27/1992	Diesel	Closed
Fingerle Lumber Co.	202 E. Madison	12/19/1990	Diesel	Closed
U of M Argus Building	400 4th St.	2/14/1990	Not Reported	Open
Emre Fuel Inc.	402 S. Main St.	10/25/1991 5/22/2002	Unknown Gasoline	Closed Closed
Main Street Gas Station	428 S. Main St.	10/18/1991	Unknown	Closed
A & L Parts Inc.	521 S. Ashley	04/08/1992	Unknown	Closed
Parks and Recreation (Subject Property)	415 W. Washington St.	3/6/1992 9/19/1989 12/20/1989	Gasoline Not reported Not reported	Open Open Open

1. This address coincides with Pizza Pino today.

Releases from closed LUST sites listed above do not pose a risk to the subject property because of their release status, distance or direction relative to the subject property. The U of M Argus Building poses a potential REC to the subject property because of its proximity and it is upgradient in the direction of groundwater flow. The remaining open status LUST sites are downgradient or cross gradient of the subject property, therefore they do not pose a potential REC.

3.15 Underground Storage Tank and Above Ground Storage Tanks

The Registered UST list provides information for all registered USTs in the State. Ten UST sites were identified in the database search within one-quarter mile of the subject property.

Property Name	Address	In use?	Removed or Closed in place?
Modern Car Wash	318 W. Liberty St.	No	Yes
JB's Auto Service	325 W. Liberty St.	Unknown	Unknown
Ann Arbor Implement Co.	210 S. 1st St.	No	Yes
WCP Investments Partnership	117 N. 1st St.	No	Yes
Budget Rent-A-Car	200 S. Ashley St.	No	Yes

Ro-An Realty Co.	218-220 W. Huron St.	No	Yes
Ashley Terrance Development	208 W. Huron St.	No	Yes
Emre Fuel Inc.	402 S. Main St.	Yes	Yes – 5 Removed 3 Currently in use
Main Street Gas Station	428 S. Main St.	No	Yes
Bill Muncy's Service	423 Miller Ave.	No	Yes
Liberty Street[1]	221 W. Liberty	No	Unknown[2]

1 = This address coincides with Pizza Pino today.
2 = UST site listed on the orphan site summary and is within the search radius of ¼ mile of the subject property.

Seven of the above UST sites are also listed on the LUST site list. The LUSTs are closed and the USTs in use have no releases reported. Emre Fuel Inc., the only UST site with active tanks, is located cross gradient of the subject property. If a release occurred it would not pose a potential REC to the subject property due to the direction of groundwater flow.

3.16 Activity and Use Limitations

Sites listed in the Activity and Use Limitations (AUL) database are sites with engineering and/or institutional controls in place. DeLong BBQ Pit (314 Detroit St.) is listed in the database search and the site is restricted to commercial III or IV property. DeLong BBQ Pit is located $^{1}/_{4}$ – ½ mile cross gradient of the subject property. Fingerle Lumber Co. (617 S. 5th Ave.) is located ¼ - ½ mile cross gradient of the subject property. Bill Muncy's Service (423 Miller Ave.) is listed on the database search as having site-specific restrictions, groundwater consumption restrictions, excavation and soil movement restrictions, and a site health and safety plan. Bill Muncy's Service is located $^{1}/_{8}$ - ¼ mile north of the subject. This site is downgradient of the subject property and is not expected to pose a risk to the subject property.

3.17 Brownfields

The brownfields list contains information regarding brownfields properties addressed by the U.S. EPA Targeted Brownfields Assessments program, which is designed to help states, tribes, and municipalities minimize the uncertainties of contamination often associated with brownfields. Three brownfield sites appeared in the database search.

Property Name	Address	Cleanup Required?	Cleanup conducted?
Armen Cleaners	630 S. Ashley St.	Unknown	Interim Response in

			Progress[1]
226 W. Liberty St.	226 W. Liberty St.	Yes	Unknown
200 S. Ashley St.	200 S. Ashley St.	Yes	Unknown[2]

1 = An internet search found that no interim response is in progress as of June 23, 2012.
http://annarborchronicle.com/2012/06/23/ann-arbor-city-council-oks-618-s-main/

2 = EDR indicates soil was affected and cleaned up. It is unknown if any other media were affected.

The sites listed at 200 S. Ashley and 226 W. Liberty are within 0 – $^1/_8$ mile east and southeast of the subject property respectively. Based on cross gradient groundwater flow, these sites do not pose a potential risk to the subject property.

3.18 Baseline Environmental Assessment Sites

The Baseline Environmental Assessment (BEA) Database provides a listing of all sites for which a BEA has been completed. The subject property is not listed as a BEA site. The database search identified 13 BEA sites within one-half mile of the subject property.

- 507-511 S. Ashley St.
- 110 Miller Ave.
- 314 Detroit St.
- 204 W. Huron St.
- 200 S. Ashley St.
- 220 Felch St.
- 202 S. Division St.
- 221 W. Liberty St.
- 521 S. Ashley St.
- 502 S. Main St.
- 551 S. 4th St.
- 552-564 S. Main St.
- 601 S. Main St.

These sites are not expected to pose a risk based on their BEA status.

3.19 RCRA-Non Generator Sites

RCRA Non-Generator sites included in the database include selective information of sites which transport, store, and/or dispose of hazardous waste, but do not currently generate hazardous waste. There were ten RCRA-NonGen sites listed within ¼ mile of the subject property.

Property Name	Address
Ann Arbor YMCA (current occupant) (Former site use history)	400 W. Washington St.
Painters Supply & Equipment	211 W. Liberty St.
Thermo Analytical ENVR Research	117 N. 1st St.
Ashley Group LLC	213-215 S. Ashley St.
Ro-An Realty Co	208 W. Huron St.
W. Washington Street Association	112 W. Washington St.
Great Copy Co.	110 E. Washington St.
City of Ann Arbor	111 N. Main St.
2020 Communications	106 N. 4th Ave.
Ann Arbor Circuits Inc.	424 W. Washington St.

Thermo Analytical Environmental Research has received a violation in the area of 'Generators – General' in 1987, however the specific regulation violated was not reported. Notice of this violation was received and an onsite compliance evaluation was performed. Ann Arbor Circuits Inc. received two violations in 1988 and one in 1997 in the area of 'Generators – General', and 'Generators – Pre-Transport'. The specific regulation violated was not reported. Notice of these violations was received and onsite compliance evaluations were performed. No other RCRA-NonGen sites received violations.

3.20 Delisted Contaminated Sites

Delisted State Hazardous Waste Sites (DELSHWS) have been deleted from the List of Contaminated Sites. A review of the DELSHWS lists revealed one site within one mile of the subject property. Montgomery Pumping Station (432 Montgomery) was delisted because it no longer met criteria specified for DELSHWS sites.

3.21 Dry Cleaners

According to the EDR radius report, no drycleaners were found within a ¼ mile of the subject property.

3.22 Manufactured Gas Plant Sites

The EDR Proprietary Manufactured Gas Plant (MGP) Database includes records of coal gas plants. Materials and byproducts of gas production are frequently disposed of at the plant site and can remain, serving as a continuous source of soil and groundwater contamination. A review of the MGPs within one mile of the subject property revealed two sites. Both sites are

located northeast of the subject property. City Gas Works (Beakes Street) and The Ann Arbor Gas Company (Broadway Street) are downgradient of the subject property and do not pose a risk to the subject property.

3.23 Orphan Sites

EDR designates a listed site as an Orphan Site when the address cannot be properly located. EDR identified twenty Orphan Sites in the summary. Each of the twenty-seven listed orphan sites was identified and six are within one mile of the subject property. These include the following:

Site Name	Data Base
MI Dept/Natural Resources and Environment	RCRA NonGen / NLR
Madison and Main Streets.	BROWNFIELDS
Eaton Corporation – Ann Arbor	BEA
MichCon Beakes Street	Hazardous Waste Site (HWS)
401 & 411 E. Washington	BEA
391 & 401 Miller Rd.	BEA

The Orphan Site at the east bank of Argo Pond in the Huron River (MI Dept/Natural Resources and Environment) is a listed RCRA NonGen/NLR site. The site is located north of the subject property. Because the direction of regional groundwater flow is to the north-northeast, this site does not pose a risk to the subject property.

The Orphan Site at Madison and Main Streets is listed as a Brownfields site. No additional information was available for this site. Based on the direction of groundwater flow however, this site does not pose a risk to the subject property.

The Orphan Site at the southwest corner of S. 1st Street and W. Liberty Street (Eaton Corporation – Ann Arbor) is a listed BEA site. Since this site is upgradient of the subject property, in the direction of groundwater flow, and is listed on the SHWS database, it does pose a potential risk to the site. The Orphan Site at 401 and 411 E. Washington, and 391 and 401 Miller Road are also listed BEA sites. The sites are cross gradient or downgradient of the subject property, therefore these sites do not pose a risk.

The MichCon Beakes Street site is listed as a SHWS and is within 2,000 feet of the subject property. The site is located northeast of the subject property. Because the direction of regional groundwater flow is to the northeast, this site does not pose a risk to the subject property. An interim response is in progress for a portion of this site. An article published on the Ann Arbor.com website describes the remedial work at the site and the progress made as of January 3, 2013 (http://www.annarbor.com/news/dte-energy-calls-michcon-cleanup-success/).

4. PHYSICAL SETTING

The topography at the subject property is generally flat; gently sloping north-northeast, toward the Huron River. West of the subject property, the topography is sloping to the east. The subject property is approximately 2,000 feet southwest of the Huron River and is partially bound by a 20-foot high AARR embankment to the east and a 20-foot high slope to the south at the Liberty Car Wash located at 318 W. Liberty St.

The United States Department of Agriculture Web Soil Survey indicates that two soil units were mapped across the subject property, Fox sandy loam, and Matherton sandy loam (**Appendix I**). These soils are described as level to very gently sloping. The Matherton sandy loam is described as somewhat poorly drained, while the Fox sandy loam is described as well drained. The site is located within an area classified as urban land. This classification indicates that soils have been mechanically re-worked thus making the original soil properties no longer evident. The bedrock geology is described as Mississippian Coldwater Shale by W.R. Farrand, 1982.

Allen Creek traverses northwest to north through the subject property before turning northeast toward the Huron River. The creek was re-routed through storm sewers underground, sometime between 1908 and 1916 in accordance with the Sanborn Maps. The subject property sits primarily on the floodway and flood fringe of the Huron River, and a small section of the subject property is upland (**Appendix J**).

5. KNOWLEDGEABLE SITE CONTACTS

Joy Gryzenia interviewed City of Ann Arbor Senior Engineer Elizabeth Rolla, on January 18, 2013. Ms. Rolla was the project manager for remediation activities at the subject property. During a phone interview with Elizabeth Rolla on January 18, 2013, the following information was noted:

- The USTs were used by the Field Services Department for fueling lawn mowers and equipment.
- There were multiple USTs onsite that had leaked. The tanks were removed and a remediation system was installed. The exact number and contents of the tanks are unknown.
- Remediation at the site began in 1997 with the installation of a pump and treat system and air sparge units.
- The system was successful in removing concentrations of BTEX and PNA compounds below Part 213 Tier 1 residential groundwater criteria in all monitoring wells except MW-6 and MW-11.
- In a memo dated June 25, 2004, Ms. Rolla recommended that NTH Consultants continue to remediate the subject property by re-installing MW-11 and continuing groundwater sampling at the site. It was thought that natural attenuation would likely bring benzene concentrations in MW-6 and MW-11 below MDEQ criteria.
- No additional work was completed, including re-installation of MW-11.
- The remediation system onsite was turned off, but to Ms. Rolla's knowledge nothing was removed from the system making it inoperable.

6. SITE RECONNAISSANCE

Site reconnaissance was conducted on the subject property on January 15, 2013 by Ms. Joy Gryzenia, Project Geologist with Tetra Tech. Ms. Gryzenia was accompanied during the onsite reconnaissance by Mr. Kevin Johnson, a ten year veteran of the City of Ann Arbor Parks and Recreation Department. Mr. Johnson provided information about the City of Ann Arbor's historical use of the subject property and was able to provide site access. The purpose of the site visit was to assess the current land use and identify potential environmental concerns at the subject property.

A U-shaped set of buildings are located on the subject property. The buildings are divided into four sections: The North Garage, West Garage, South Garage, and Open Sheds (**Figures 1 and 2**). All three garage areas were inspected, including offices located on the second floor of the North Garage. During the site reconnaissance, the interior of the North and West Garages were found to be used as storage for RPS and City of Ann Arbor equipment. The South Garage is currently used for chemical, salt, and equipment storage. The Open Sheds are surrounded by fences, prohibiting access, although the interior of the sheds are visible. The Open Sheds are vacant. A gravel parking lot and vacant area behind the South Garage were included in the site reconnaissance. A remediation system was observed south of the North Garage, but was not accessible. The following sections include details of observations made during the site reconnaissance. Photographs taken during the site reconnaissance are included in **Appendix K**.

6.1 Observations

The following sections present specific observations made during the reconnaissance of the interior and exterior during the on-site reconnaissance.

6.2 Hazardous Substances and Petroleum Products

Three full portable gas tanks were observed at the subject property. The tanks appeared to have a 100 gallon capacity and there was no evidence of staining. The tanks were located within the South Garage. The existence of the petroleum product requires the propane tanks be classified as a REC.

Heavy machinery equipment was disassembled on the ground of the South Garage. Disconnected hydraulic oil lines were observed. A stain on the ground was observed and

absorbent material was placed on top of the stain. The stain appeared de minimis. A stain from an unknown source was visible on the ground near the west wall of the south garage.

Mercury containing thermostats and Americium 241-containing smoke detectors were located inside the offices above the North Garage.

Two 55-gallon drums of xylene were found in the South Garage. The drums were not placed on a containment pad, however, no stains were observed around the drums. The existence of the drums of xylene requires this area be classified as a REC.

Lawn mowers were repaired in the West Garage. Hydrocarbons are not known to have been used in the West Garage but the potential exists. Upon inspection of the concrete floor, no cracks or pits were observed. This does not pose a risk to the subject property.

6.3 Storage Tanks

No storage tanks were observed during the site reconnaissance.

6.4 Pool of Liquid

No pooling liquid was identified.

6.5 Drums

Two 55-gallon drums of urethane deck coating, two 55-gallon drums of xylene, four unmarked full 55-gallon drums, and two 40-gallon and one 55-gallon drums of compound cleaning liquid were found in the South Garage. The existence of these drums requires they be classified as a REC.

6.6 Unidentified Substance Containers

Multiple paint cans, bottles, one and two gallon metal containers, four 55-gallon drums, and spray cans were observed inside the South Garage. The contents were contained and there was no visible evidence of leaking on the container. The four unmarked full 55-gallon drums represent a REC.

6.7 Polychlorinated Biphenyls

No PCB-containing transformers were identified on or near the subject property.

6.8 Pits, Ponds, or Lagoons

No pits, ponds or lagoons were identified on the subject property.

6.9 Soil Inspection

Stained soil was not observed on the exterior portions of the subject property during the site reconnaissance.

6.10 Stressed Vegetation

Stressed vegetation was not observed on the subject property during the site reconnaissance.

6.11 Odors

An olfactory observation was noted inside the South Garage. Chemicals stored inside this building, are likely the source of the odor.

6.12 Solid Waste

A solid waste dumpster is located inside the South Garage. Solid waste can be found throughout the buildings.

6.13 Waste Water

Sanitary sewer manholes are located onsite. Stormwater sewers are also located throughout the subject property. It is unknown if the drains inside the South Garage salt storage area lead to the sanitary system or the stormwater sewer system.

6.14 Wells

The subject property is currently serviced by a municipal water supply. Eight monitoring wells and three nested piezometers were observed during the site reconnaissance. The wells are primarily positioned around the remediation system. City employees confirmed that these wells were installed during the LUST cleanup. The remediation system is surrounded by a chain-linked fence that does not have a gate, making it is inaccessible.

6.15 Septic Systems

An onsite septic system was not observed during the site reconnaissance. The subject property uses the municipal sanitary sewer.

6.16 Sumps and Trenches

A sump and associated trench is located within the boiler room, east of the North Garage. The trench and sump appeared to be dry. A set of trenches and drains were observed in the North Garage that were filled with soil. Previous usage of the trenches and drains are unknown.

7. FINDINGS AND CONCLUSIONS

This report presents the findings of a Phase I ESA for the City of Ann Arbor property located at 415 W. Washington Street, Ann Arbor, Michigan, Washtenaw County (subject property) in conformance with the scope and limitations of ASTM Standard E 1527-05. The Phase I ESA was conducted for the purpose of providing information on current environmental conditions of the subject property. The Phase I ESA process involves reviewing site information, searching relevant government databases, performing interviews with persons knowledgeable with site use and completing a visual reconnaissance of the site in order to identify RECs.

The Phase I ESA for the subject property has identified 8 RECs for the subject property based on available information. RECs include:

1. Chemical Storage Area (two 55-gallon drums of xylene, four unmarked 55-gallon drums, various chemicals, and staining) located in the South Garage;
2. Soil and groundwater beneath the former 10,000 gallon fuel oil AST in the northern portion of the subject property;
3. Soil and groundwater beneath the former 10,000 gallon fuel oil AST in the northeastern portion of the subject property;
4. Potential soil and groundwater impacts beneath the two former 6,000 gallon unleaded gasoline and diesel USTs (tank farm);
5. Soil beneath the salt storage area in the South Garage; and
6. Soil beneath the three full fuel tanks in the South Garage.

In addition, the following items which are not RECs but may warrant further consideration were identified in completing this Phase I ESA:

7. Location of AH17-1 soil sample, based on FOIA documents;
8. Location of AH17-2 soil sample, based on FOIA documents;
9. Allen Creek Drain, a listed Part 201 site, located beneath the subject property;
10. Labeled ‘asbestos containing’ wrapped pipes observed within the building;
11. The Eaton Corporation property located south of the subject property; and

12. The U of M Argus Building open leaking underground storage tank (LUST) site and state hazardous waste site (SHWS) located southwest of the subject property.

Historical practices and previously remediated areas include:

13. The former oil house located southeast of the North Garage;
14. The former tar storage area located on the northeastern portion of the property;
15. The former coal storage area located on the northeastern and central portion of the property.

8. SCOPE OF ACTIVITY

This Phase I ESA has been completed in a manner consistent with the level of care and skill ordinarily exercised by other professional consultants under similar circumstances. It is based on the application of scientific principles and professional judgment to certain facts with resultant subjective interpretations. The professional judgments expressed herein are based on facts currently available within the limits of the exiting data, scope of work, budget, and schedule. To the extent that more definitive conclusions are desired by the client than are warranted by the currently available facts, it is specifically Tetra Tech's intent that the conclusions and recommendations stated herein be intended as guidance, and not necessarily a firm course of action, except where explicitly stated as such. We make no warranties, expressed or implied, including without limitations, and warranties as to merchantability or fitness of the property for a particular purpose. In addition, the information provided to you in this report is not to be construed as legal advice.

8.1 Limitation of Use of this Report

Tetra Tech is not engaged in environmental assessment and reporting for the purpose of advertising, sales promotion, or endorsement of any client's interest, including raising investment capital, recommending investment decisions, or other publicity purposes. Client acknowledges that this report has been prepared for their exclusive use, and agrees that reports or correspondence from Tetra Tech will not be used or reproduced in full or in any part for such purposes, and may not be used or relied upon in any prospectus or offering circular. Client also agrees that none of the advertising, sales promotion or other publicity information obtained from this environmental assessment and report will mention or imply the name of Tetra Tech.

8.2 Limitations and Exceptions

The findings, conclusions, and interpretations are subject to modification if subsequent information is developed by Tetra Tech or others. The findings of this report are time-specific and are only representative of subject property conditions as they existed at the time of the site visit.

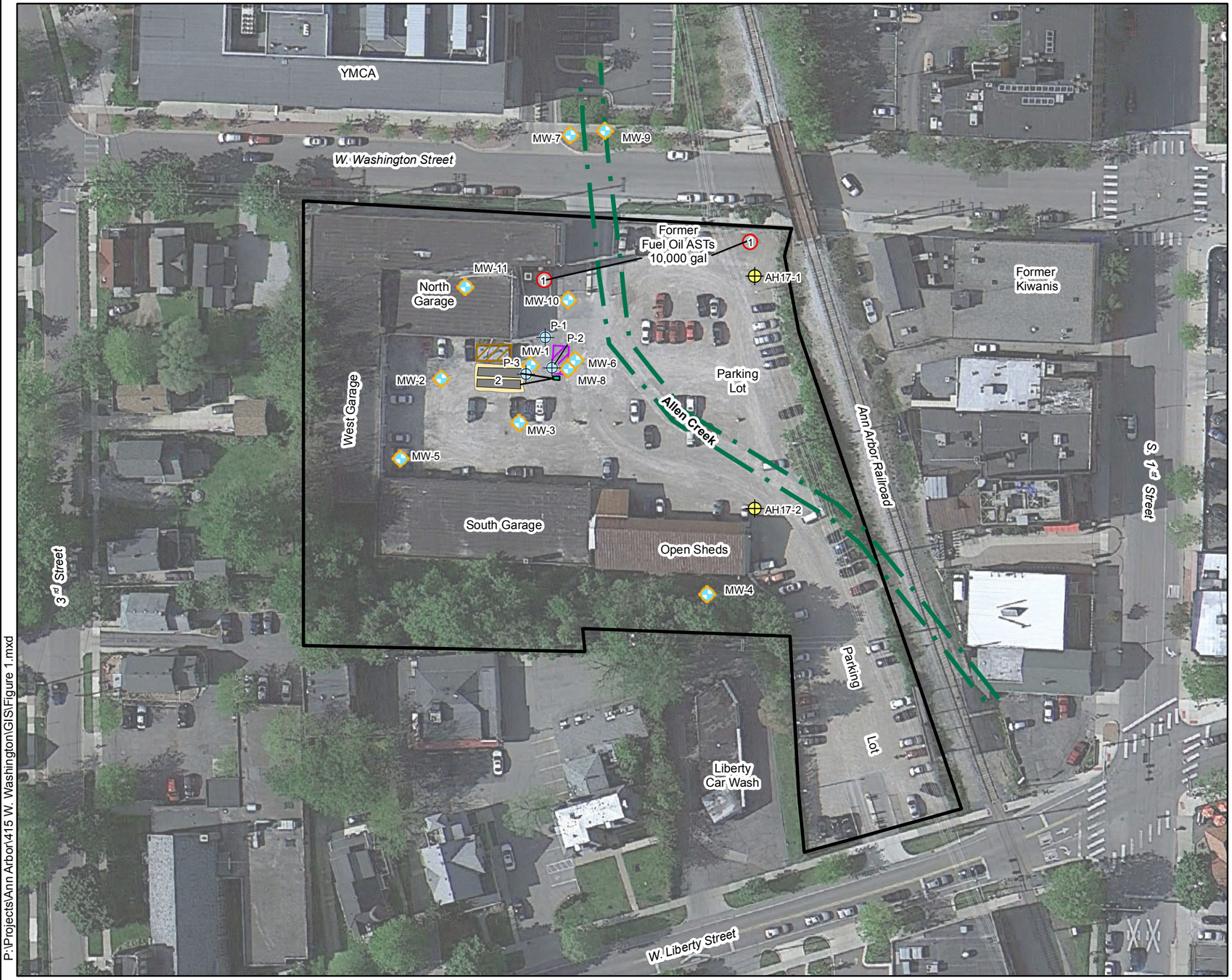
This report has been prepared for the benefit of the City of Ann Arbor and was compiled based partially on information supplied to Tetra Tech from outside sources and other information in the public domain. Tetra Tech has examined and relied on documents referenced in this report and on oral statements made by certain individuals. Tetra Tech has not conducted an independent

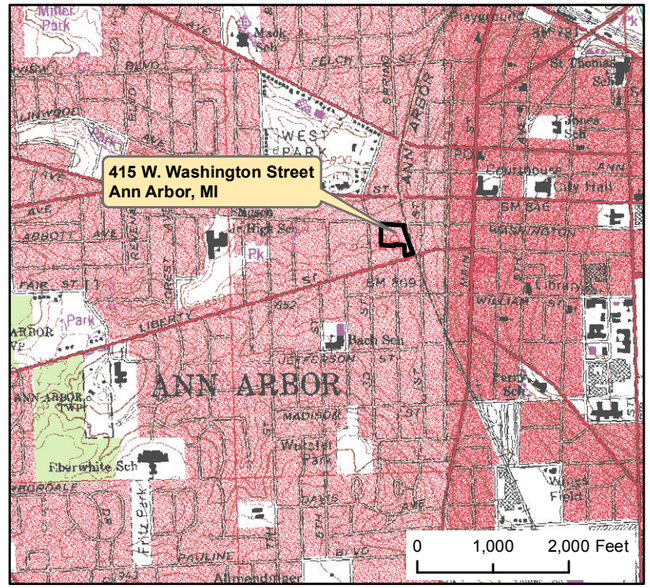
examination of the facts contained in referenced materials and statements. Tetra Tech has assumed that the documents are genuine and that the information provided in documents or statements is true and accurate. Tetra Tech has prepared this report in a professional manner, using the degree of skill and care exercised for similar projects under similar conditions by reputable and competent environmental consultants. The opinions herein are based on the information Tetra Tech obtained while compiling the report. Tetra Tech makes no warranty as to the accuracy of statements made by others that may be contained in this report, nor are any other warranties or guarantees, expressed or implied, included or intended by the report, except that it has been prepared in accordance with the current generally accepted practices and standards consistent with the level of care and skill exercised under similar circumstances by other professional consultants or firms performing the same or similar services. Differing conclusions about environmental features could be reached because the facts that form the basis for the report are subject to professional interpretation. Tetra Tech does not assume responsibility for the discovery and elimination of hazards that could cause accidents, injuries, or damage. Compliance with submitted recommendations or suggestions does not ensure that hazards will be eliminated or the City of Ann Arbor's obligations will be fulfilled under local, state, or federal laws or any modifications or changes to these laws. None of the work performed shall constitute or be represented as a legal opinion of any kind or nature, but shall be a representation of findings of fact from records examined.

The information contained in this report, including all exhibits and attachments, may not be used by any other party without the express written consent of the City of Ann Arbor or Tetra Tech. This report is partially based on information obtained from City of Ann Arbor files and personnel. Tetra Tech does not guarantee the authenticity or reliability of the information it has received from these sources.

Qualifications of the Environmental Professionals are provided as **Appendix L.**

FIGURES





- Monitoring Well (MW)
- Piezometer (P)
- AH - Soil Boring
- Former AST
- Former UST
- Approximate Excavation Extent
- Former Fuel Dispensers
- Historical Remediation System
- Former Storage Shed and Previous Location of Oil House
- Allen Creek
- Property Boundary

Notes:

1. AST= Aboveground storage tank
2. UST= Underground storage tank
3. Location of property boundary, Allen Creek, ASTs, USTs, excavation extent, soil borings, historical remediation system, former storage shed and oil house are approximate.
4. Monitoring wells, piezometers and soil boring locations are estimated from historical reports.
5. The former 6,000 gallon diesel UST is located on the north side and the former 6,000 gallon gasoline UST is located on the south side of the depicted USTs.

N

0 70 140 Feet

P:\Projects\Ann Arbor\415 W. Washington\GIS\Figure 1.mxd

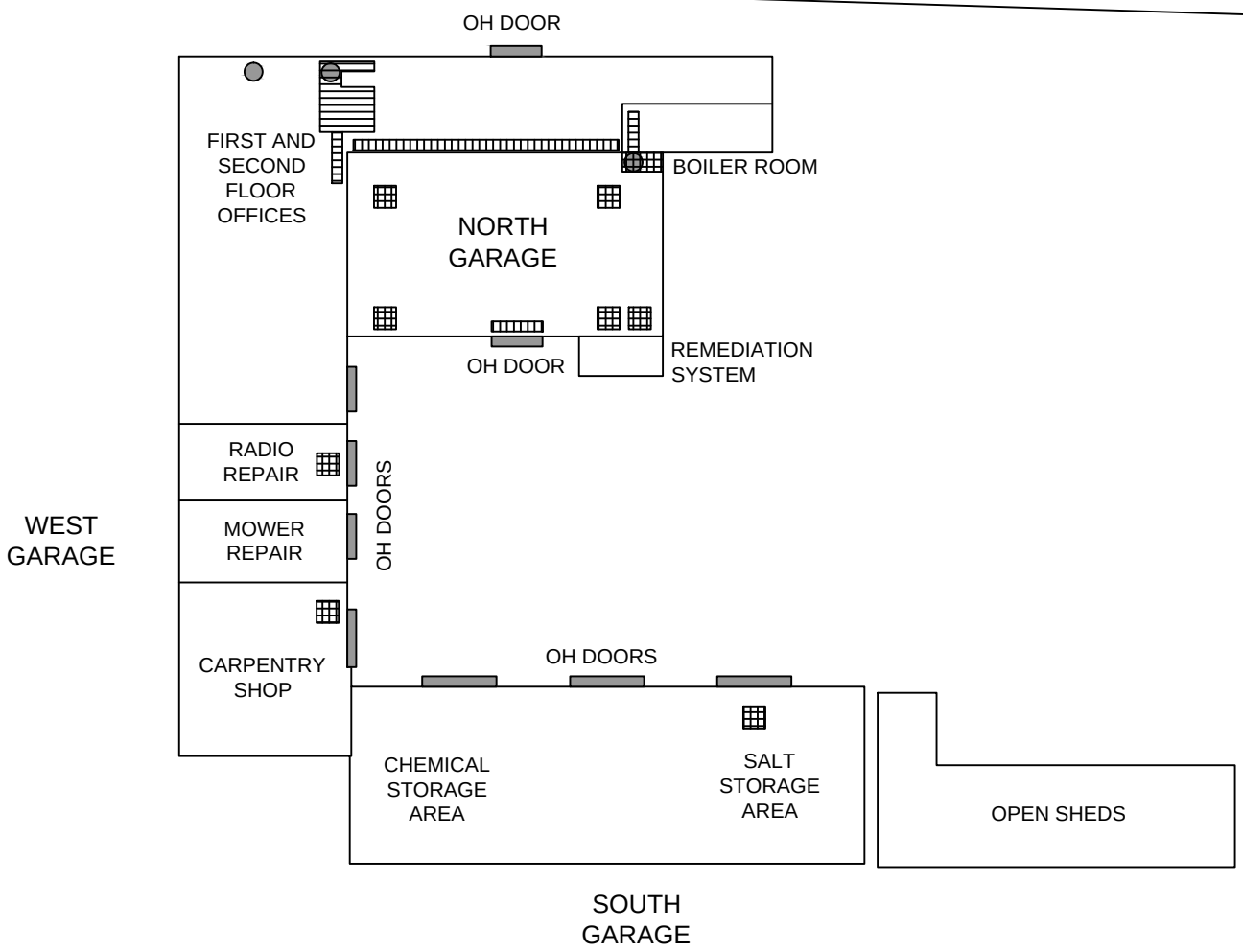
BASE MAP: MAY 2010 GOOGLE EARTH IMAGERY

ORIGINAL BY: M. CAPODIVACCA	
DATE: 01/21/2013	
REVISED BY: A. RAUSS	
DATE: 04/19/2013	

415 W. WASHINGTON STREET
PHASE I ESA
ANN ARBOR, MICHIGAN

SITE LOCATION AND LAYOUT MAP

FIGURE
1



LEGEND

- OVERHEAD DOOR
- FLOOR DRAIN
- TRENCH
- SUMP

N

50' 25' 0 50' 100'

SCALE: 1" = 50'

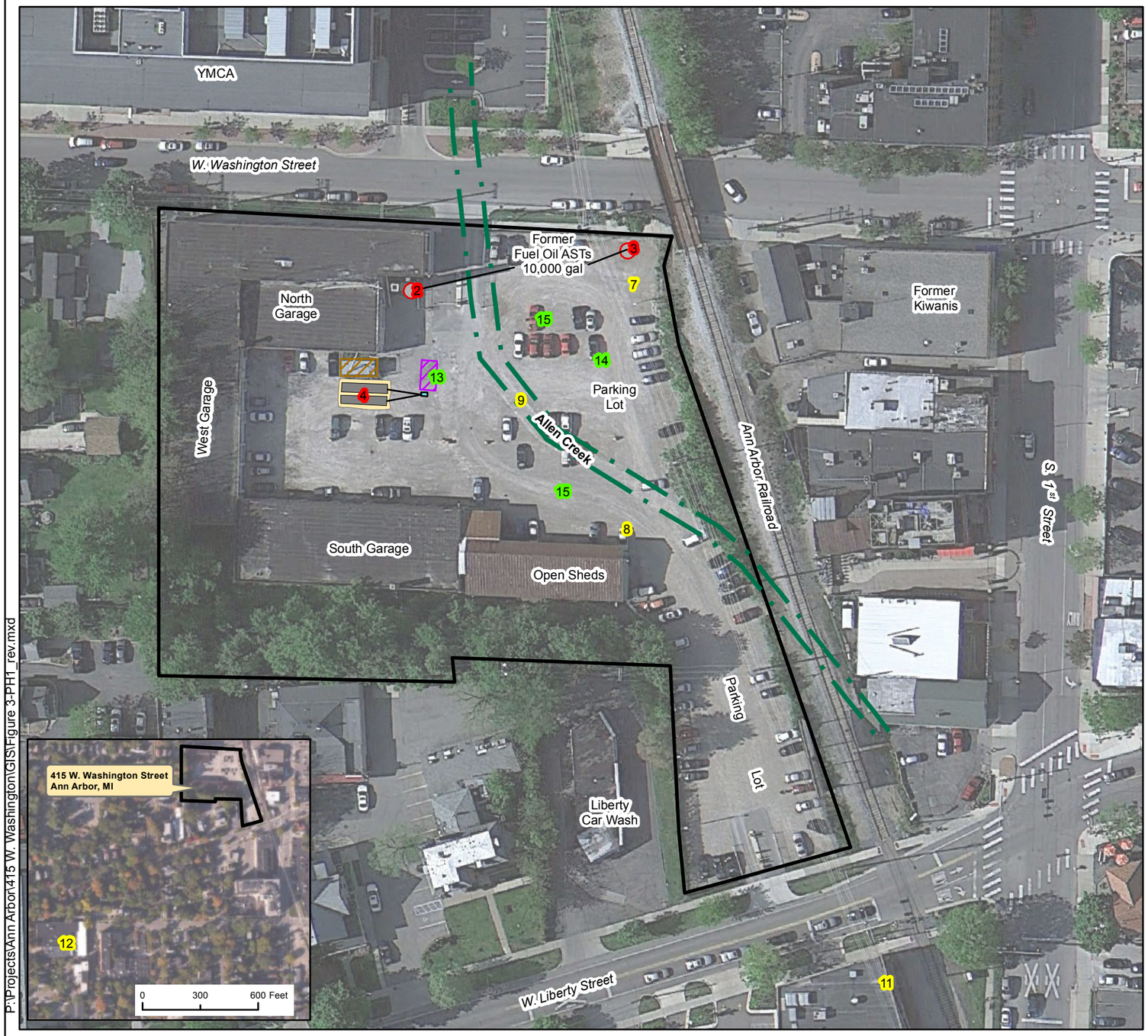
TETRA TECH

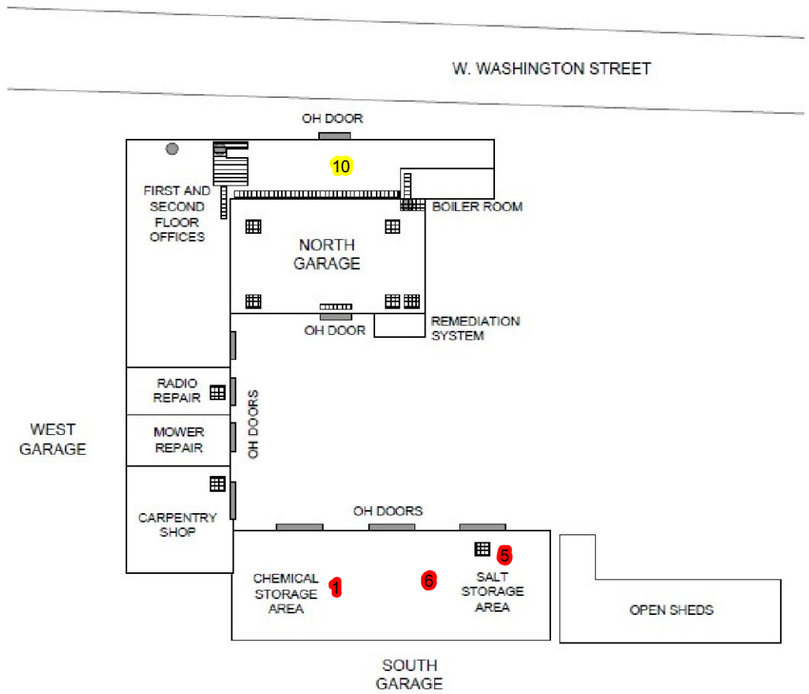
DESIGNED: AGO | DATE: 4/18/13

PHASE I ESA
415 W. WASHINGTON STREET
ANN ARBOR, MICHIGAN

SITE SCHEMATIC

FIGURE 2





- Former Aboveground Storage Tank (AST)
- Former Underground Storage Tank (UST)
- Approximate Excavation Extent
- Former Fuel Dispensers
- Historical Remediation System
- Former Storage Shed and Previous Location of Oil House
- Allen Creek
- Property Boundary

Notes:
1. Location of property boundary, Allen Creek, ASTs, USTs, excavation extent, historical remediation system, former storage shed and oil house are approximate.
2. Numbers 1 through 15 refer to identified RECs, items that require further consideration and previously remediated areas. These locations are identified and further discussed in the Findings and Conclusions (Section 7.0) of the Phase I ESA Report, dated April 22, 2013.
   - Numbers highlighted in red indicate RECs (1 through 6).
   - Numbers highlighted in yellow require further consideration (7 through 12).
   - Numbers highlighetd in green (13 through 15) indicate previously remediated and/or historical activities.

N

0 70 140 Feet

P:\Projects\Ann Arbor\415 W. Washington\GIS\Figure 3-PH1_rev.mxd

BASE MAP: MAY 2010 GOOGLE EARTH IMAGERY

ORIGINAL BY: M. CAPODIVACCA	
DATE: 01/21/2013	
REVISED BY: A. RAUSS	
DATE: 04/19/2013	

415 W. WASHINGTON STREET
PHASE I ESA
ANN ARBOR, MICHIGAN

RECOGNIZED ENVIRONMENTAL CONCERNS

FIGURE
3

APPENDICES

APPENDIX A

PROPERTY DESCRIPTION

Washtenaw County Parcel Summary

This data is received from local cities, villages, and townships. For additional information or verification, please contact your local city, village or township assessor, the Washtenaw County Clerk/Register of Deeds at (734)222-6710 or the Washtenaw County Department of Equalization at (734)222-6662.

Information herein deemed reliable but **not** guaranteed.

Parcel Identification	
Parcel Number:	09-09-29-211-003
City, Village, or Township:	CITY OF ANN ARBOR
Parcel Status:	ACTIVE
Property Address Street Number, Name & Direction	415 W WASHINGTON ST
Property City, State, Zip Code	ANN ARBOR MI, 48103
School District Number & Name	81010 ANN ARBOR PUBLIC SCHOOLS
Property Classification	095 EXEMPT

Taxpayer Identification -- Year 2013	
Taxpayer Name 1:	CITY OF ANN ARBOR (2013)
Taxpayer Name 2:	
Taxpayer Mailing Address:	* PO BOX 8647
Taxpayer City, State, Zip Code:	ANN ARBOR, MI, 48107

Assessment

Year	State Equalized Value	Taxable Value	Principal Residence Exemption %
2012	$0.00	$0.00	0
2011	$0.00	$0.00	0

Sales			
Sale Date:		Sale Price:	
Liber-Page:		Last Update:	

Washtenaw County Parcel Summary

This data is received from local cities, villages, and townships. For additional information or verification, please contact your local city, village or township assessor, the Washtenaw County Clerk/Register of Deeds at (734)222-6710 or the Washtenaw County Department of Equalization at (734)222-6662.

Information herein deemed reliable but **not** guaranteed.

Parcel Identification	
Parcel Number:	09-09-29-211-017
City, Village, or Township:	CITY OF ANN ARBOR
Parcel Status:	ACTIVE
Property Address Street Number, Name & Direction	314 W LIBERTY ST
Property City, State, Zip Code	ANN ARBOR MI, 48103
School District Number & Name	81010 ANN ARBOR PUBLIC SCHOOLS
Property Classification	095 EXEMPT

Taxpayer Identification -- Year 2013	
Taxpayer Name 1:	CITY OF ANN ARBOR (2013)
Taxpayer Name 2:	415 W WASHINGTON PSA
Taxpayer Mailing Address:	* PO BOX 8647
Taxpayer City, State, Zip Code:	ANN ARBOR, MI, 48107

Assessment

Year	State Equalized Value	Taxable Value	Principal Residence Exemption %
2012	$0.00	$0.00	0
2011	$0.00	$0.00	0

Sales			
Sale Date:		Sale Price:	
Liber-Page:		Last Update:	

Washtenaw County Parcel Summary

This data is received from local cities, villages, and townships. For additional information or verification, please contact your local city, village or township assessor, the Washtenaw County Clerk/Register of Deeds at (734)222-6710 or the Washtenaw County Department of Equalization at (734)222-6662.

Information herein deemed reliable but **not** guaranteed.

Parcel Identification	
Parcel Number:	09-09-29-211-018
City, Village, or Township:	CITY OF ANN ARBOR
Parcel Status:	ACTIVE
Property Address Street Number, Name & Direction	W LIBERTY ST VACANT
Property City, State, Zip Code	ANN ARBOR MI, 48103
School District Number & Name	81010 ANN ARBOR PUBLIC SCHOOLS
Property Classification	095 EXEMPT

Taxpayer Identification -- Year 2013	
Taxpayer Name 1:	CITY OF ANN ARBOR (2013)
Taxpayer Name 2:	ATTORNEYS OFFICE - 415 W WASHINGTON
Taxpayer Mailing Address:	* PO BOX 8647
Taxpayer City, State, Zip Code:	ANN ARBOR, MI, 48107

Assessment

Year	State Equalized Value	Taxable Value	Principal Residence Exemption %
2012	$0.00	$0.00	0
2011	$0.00	$0.00	0

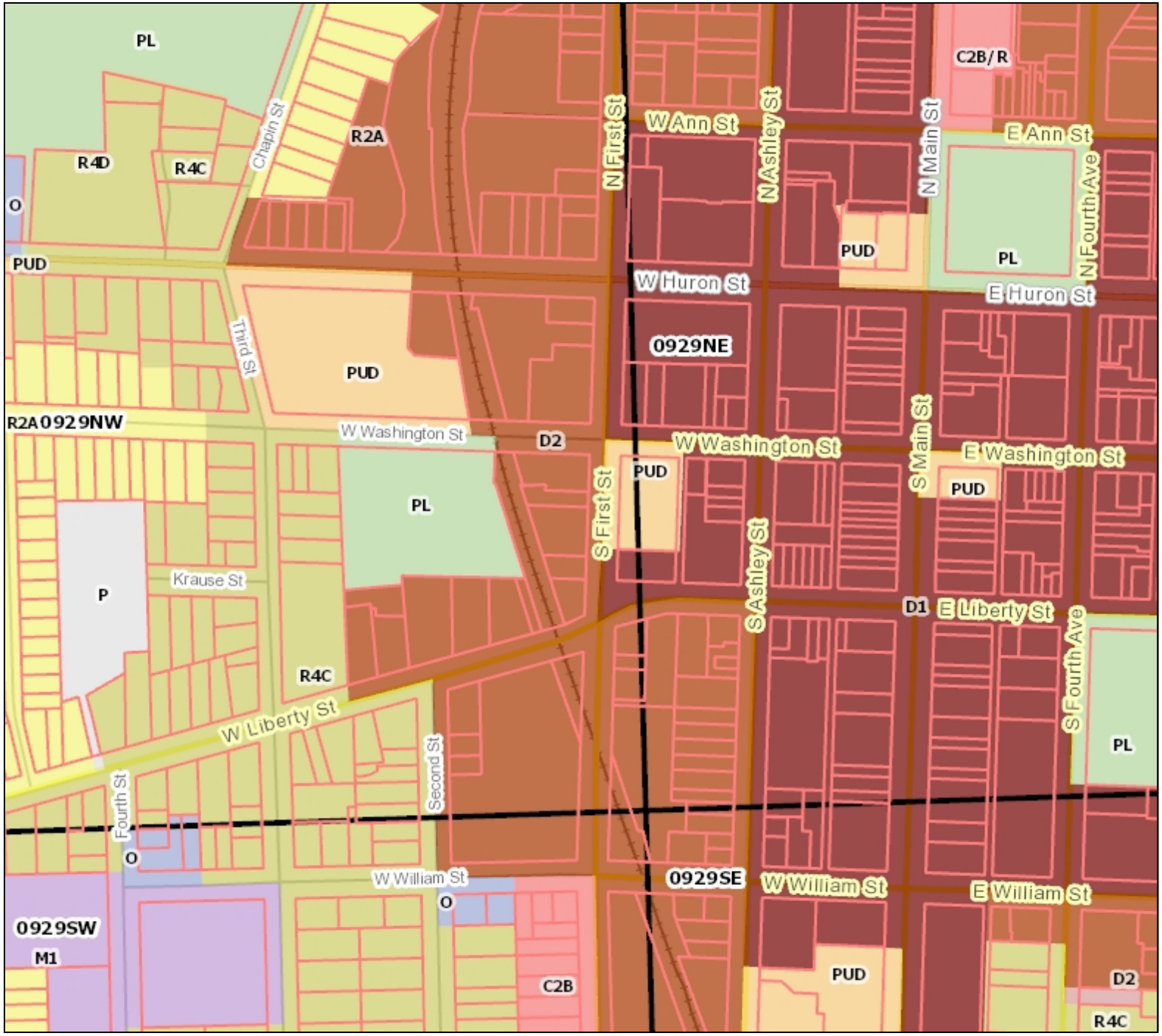
Sales

Sale Date:	02/12/1991	Sale Price:	$1.00
Liber-Page:	2474:0139	Last Update:	

APPENDIX B

CITY OF ANN ARBOR ZONING MAP

415 West Washington Street



Notes:

- Parcel Property
- Township Property
- Zoning Section Maps

Zoning Class

- AG-Agriculture/Open Space
- C1-Local Business
- C1A-Campus Business
- C1A/R-Campus Business/Residential
- C1B-Community Convenience Center
- C2A-Central Business
- C2A/R-Commercial/Residential
- C2B-Business Service
- C2B/R-Business Service/Residential
- C3-Fringe Commercial
- D1-Downtown Core
- D2-Downtown Interface
- M1-Limited Industrial

Scale is 1: 3,587
1" = 299 Feet

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2/2/2013

APPENDIX C

ENVIRONMENTAL DATABASE RESOURCES (EDR) AERIAL PHOTOGRPAHS

415 West Washington
415 W. Washington
Ann Arbor, MI 48103

Inquiry Number: 3493977.5
January 16, 2013

The EDR Aerial Photo Decade Package

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

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Please contact EDR at 1-800-352-0050
with any questions or comments.

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Date EDR Searched Historical Sources:

Aerial Photography January 16, 2013

Target Property:

415 W. Washington

Ann Arbor, MI 48103

Year	***Scale***	***Details***	***Source***
1937	Aerial Photograph. Scale: 1"=500'	Flight Year: 1937	AAA
1940	Aerial Photograph. Scale: 1"=500'	Flight Year: 1940	AAA
1949	Aerial Photograph. Scale: 1"=500'	Flight Year: 1949	Detroit Edison
1955	Aerial Photograph. Scale: 1"=500'	Flight Year: 1955	CSS
1961	Aerial Photograph. Scale: 1"=500'	Flight Year: 1961	SEMCOG
1967	Aerial Photograph. Scale: 1"=500'	Flight Year: 1967	SEMCOG
1978	Aerial Photograph. Scale: 1"=600'	Flight Year: 1978	ASCS
1985	Aerial Photograph. Scale: 1"=500'	Flight Year: 1985	SEMCOG
1992	Aerial Photograph. Scale: 1"=500'	/DOQQ - acquisition dates: 1992	EDR
1992	Aerial Photograph. Scale: 1"=600'	Flight Year: 1992	NAPP
2000	Aerial Photograph. Scale: 1"=500'	Flight Year: 2000	SEMCOG
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	EDR
2006	Aerial Photograph. Scale: 1"=500'	Flight Year: 2006	EDR

INQUIRY #: 3493977.5

YEAR: 1937

= 500'

N

EDR Environmental Data Resources Inc

INQUIRY #: 3493977.5
YEAR: 1940
= 500'
N

INQUIRY #: 3493977.5
YEAR: 1949
= 500'
N

INQUIRY #: 3493977.5
YEAR: 1955
= 500'
N
EDR Environmental Data Resources Inc

INQUIRY #: 3493977.5
YEAR: 1961
= 500'
N
EDR Environmental Data Resources Inc

INQUIRY #: 3493977.5
YEAR: 1967
= 500'
N

INQUIRY #: 3493977.5
YEAR: 1978
= 600'
N
EDR Environmental Data Resources Inc

INQUIRY #: 3493977.5
YEAR: 1985
= 500'
N
EDR Environmental Data Resources Inc

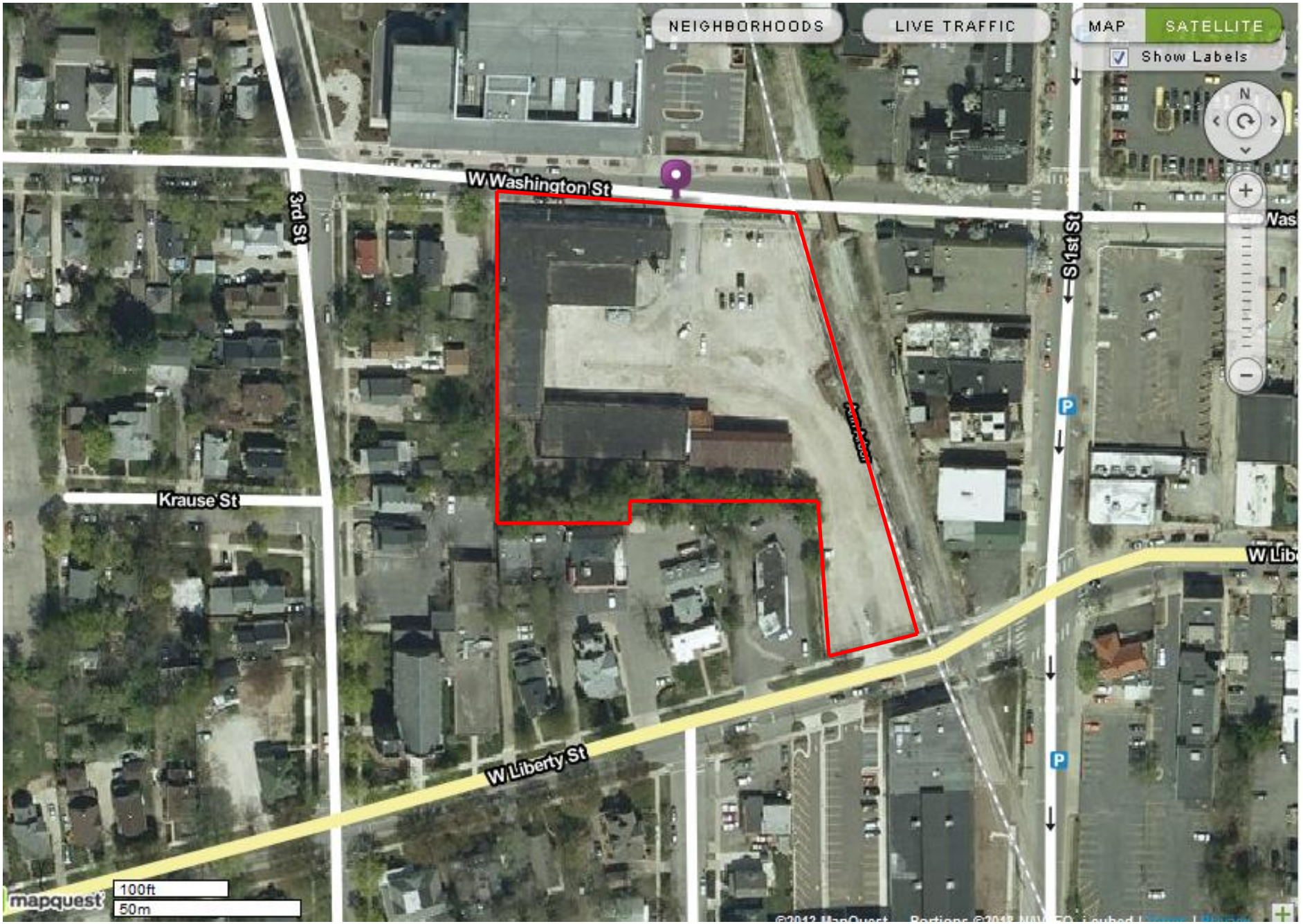
INQUIRY #: 3493977.5
YEAR: 1992
= 500'
N

INQUIRY #: 3493977.5
YEAR: 1992
= 600'
N
EDR Environmental Data Resources Inc

INQUIRY #: 3493977.5
YEAR: 2000
= 500'
N
EDR Environmental Data Resources Inc

INQUIRY #: 3493977.5
YEAR: 2005
= 500'
N

INQUIRY #: 3493977.5
YEAR: 2006
= 500'
N


NEIGHBORHOODS
LIVE TRAFFIC
MAP
SATELLITE
Show Labels
W Washington St
3rd St
S 1st St
Krause St
W Liberty St
100ft
50m
mapquest

APPENDIX D

EDR HISTORICAL TOPOGRAPHIC MAPS

415 West Washington
415 W. Washington
Ann Arbor, MI 48103

Inquiry Number: 3493977.4
January 14, 2013

EDR Historical Topographic Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

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Please contact EDR at 1-800-352-0050
with any questions or comments.

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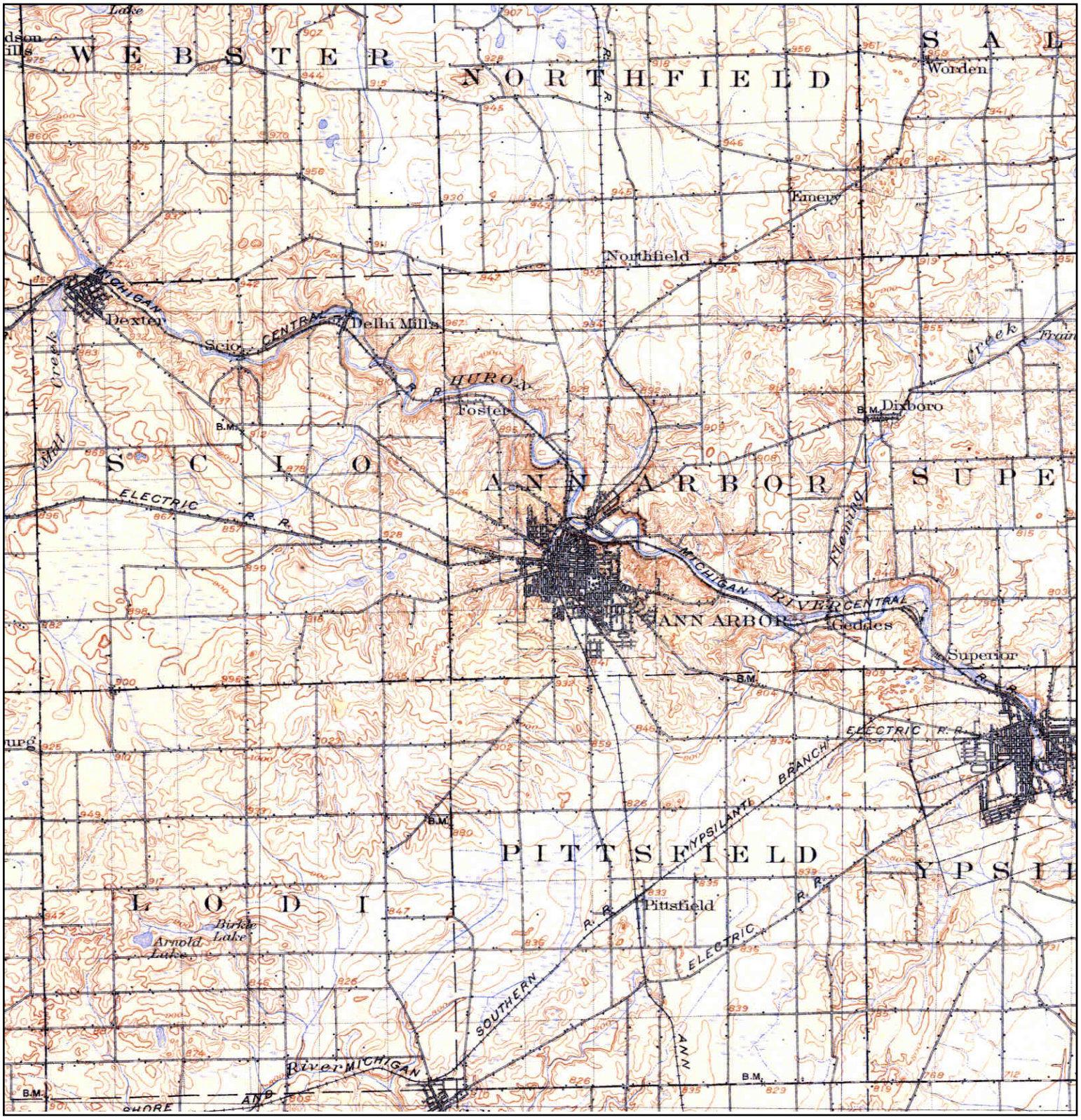
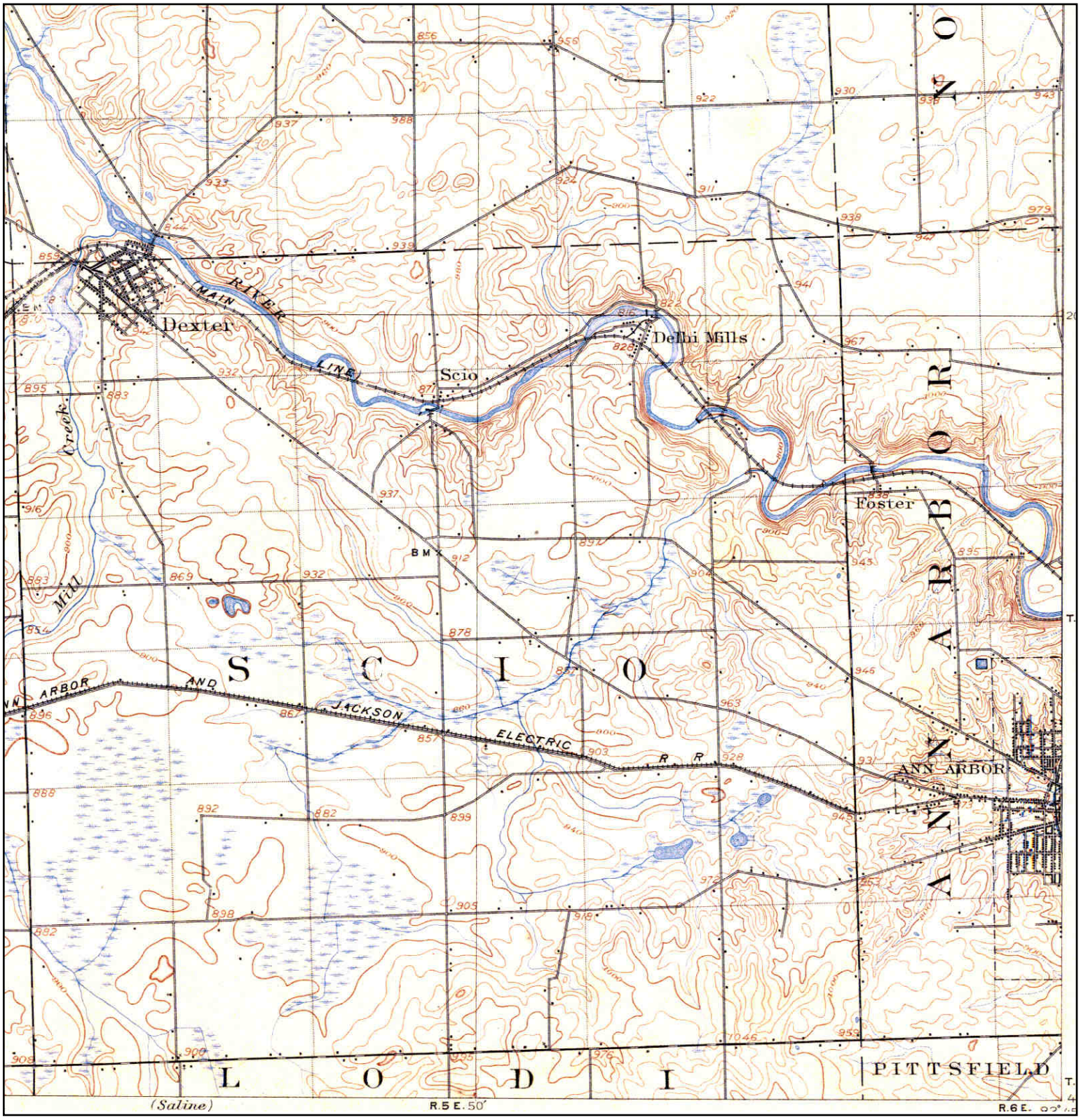
Historical Topographic Map



N	TARGET QUAD NAME: ANN ARBOR MAP YEAR: 1904 SERIES: 30 SCALE: 1:125000	SITE NAME: 415 West Washington ADDRESS: 415 W. Washington Ann Arbor, MI 48103 LAT/LONG: 42.2806 / -83.7521	CLIENT: Tetra Tech GEO CONTACT: Joy Gryzenia INQUIRY#: 3493977.4 RESEARCH DATE: 01/14/2013

Historical Topographic Map



N	TARGET QUAD NAME: DEXTER MAP YEAR: 1906 SERIES: 15 SCALE: 1:62500	SITE NAME: 415 West Washington ADDRESS: 415 W. Washington Ann Arbor, MI 48103 LAT/LONG: 42.2806 / -83.7521	CLIENT: Tetra Tech GEO CONTACT: Joy Gryzenia INQUIRY#: 3493977.4 RESEARCH DATE: 01/14/2013

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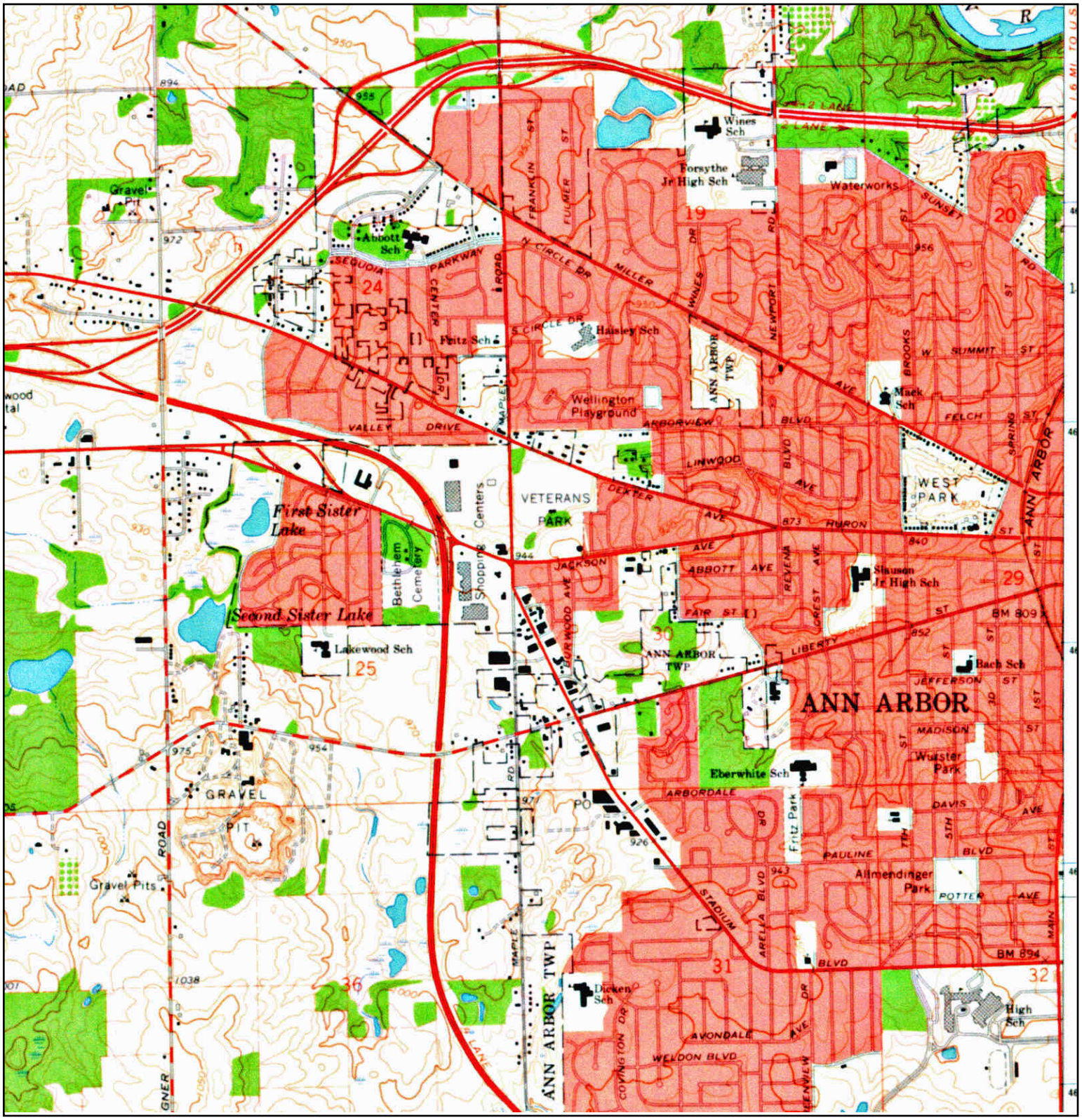
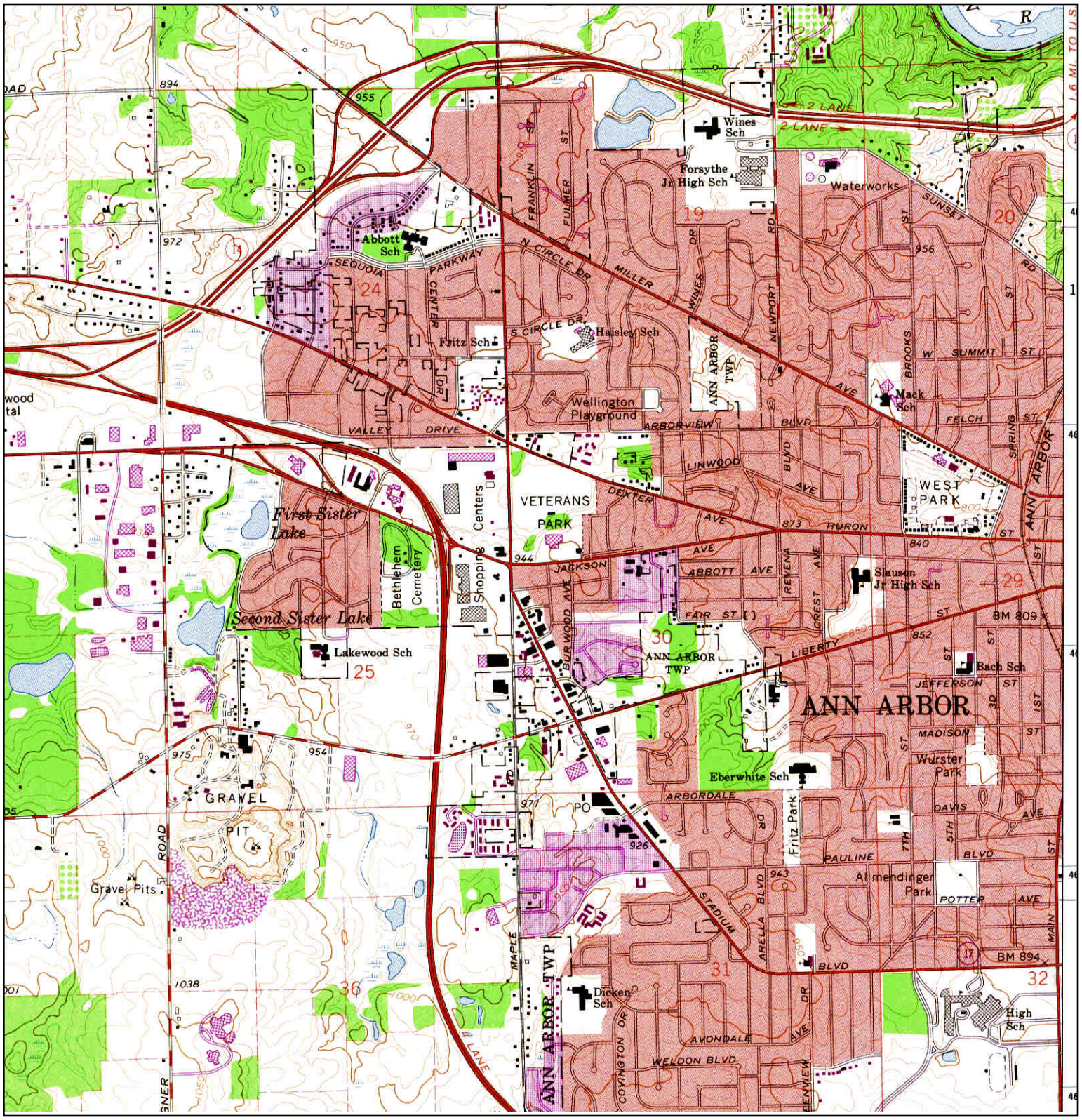


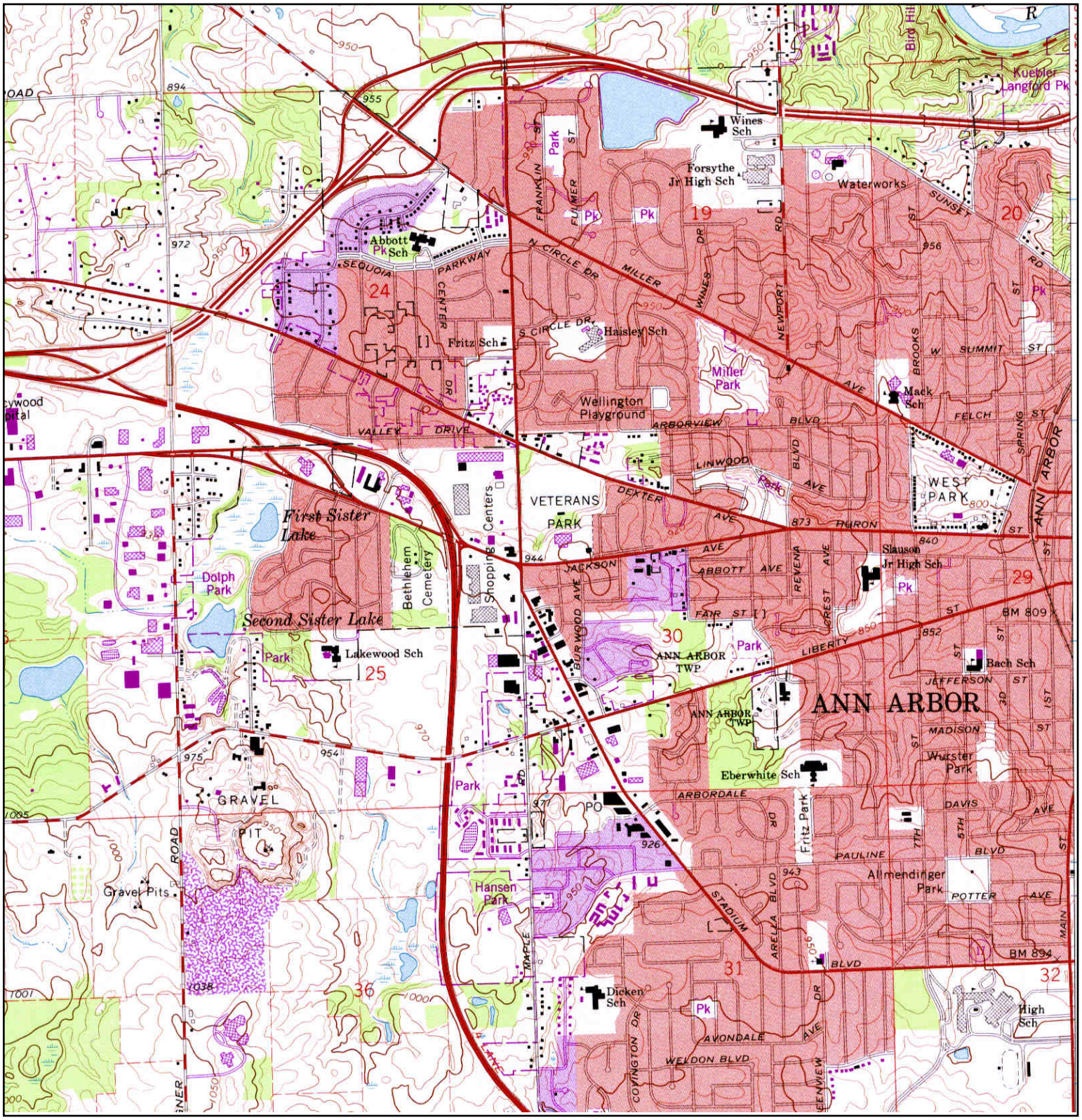
N	TARGET QUAD NAME: ANN ARBOR WEST MAP YEAR: 1965 SERIES: 7.5 SCALE: 1:24000	SITE NAME: 415 West Washington ADDRESS: 415 W. Washington Ann Arbor, MI 48103 LAT/LONG: 42.2806 / -83.7521	CLIENT: Tetra Tech GEO CONTACT: Joy Gryzenia INQUIRY#: 3493977.4 RESEARCH DATE: 01/14/2013

Historical Topographic Map



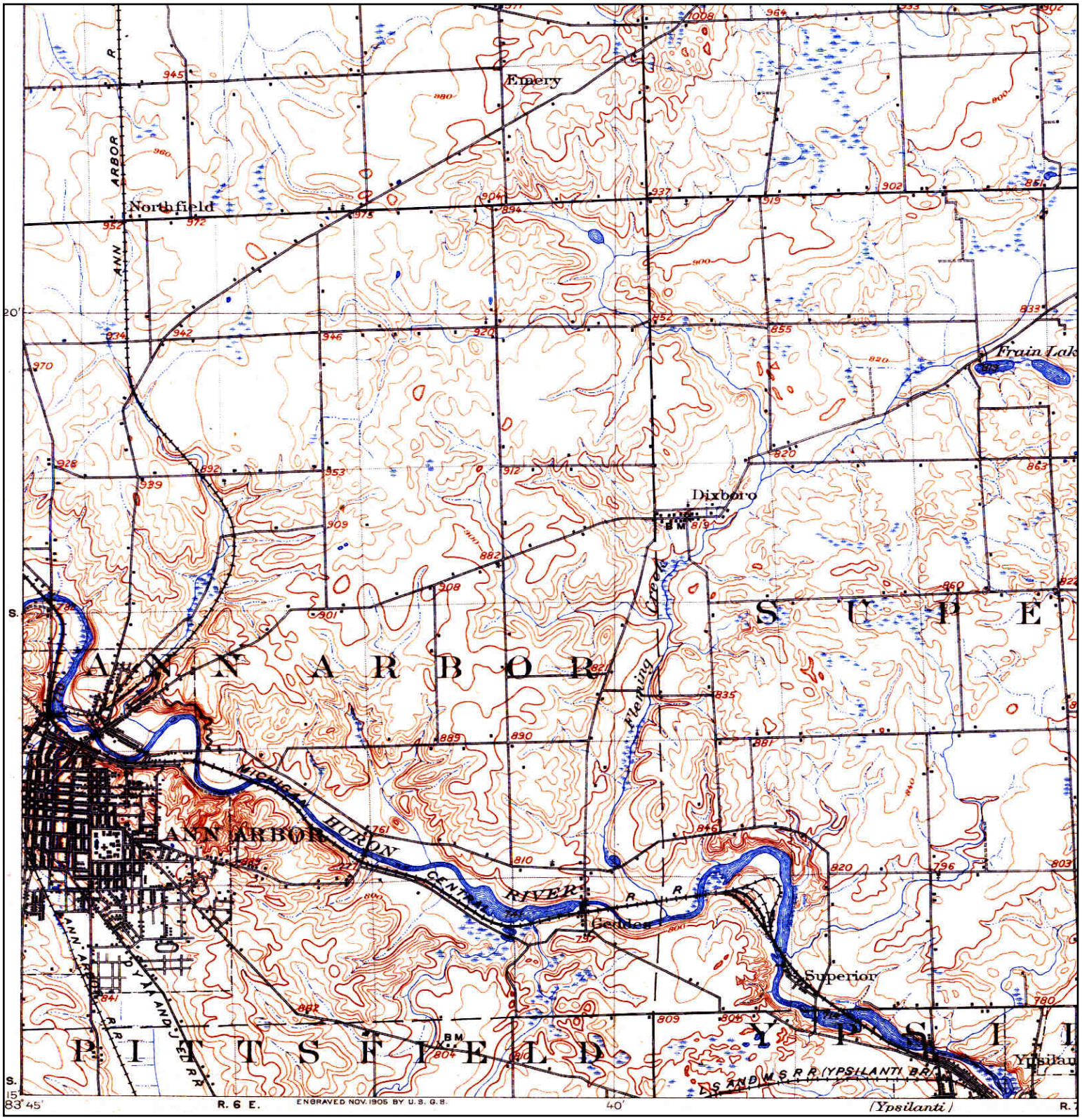
N	TARGET QUAD NAME: ANN ARBOR WEST MAP YEAR: 1975 PHOTOREVISED FROM :1965 SERIES: 7.5 SCALE: 1:24000	SITE NAME: 415 West Washington ADDRESS: 415 W. Washington Ann Arbor, MI 48103 LAT/LONG: 42.2806 / -83.7521	CLIENT: Tetra Tech GEO CONTACT: Joy Gryzenia INQUIRY#: 3493977.4 RESEARCH DATE: 01/14/2013

Historical Topographic Map



N	TARGET QUAD NAME: ANN ARBOR WEST MAP YEAR: 1983 PHOTOREVISED FROM :1965 SERIES: 7.5 SCALE: 1:24000	SITE NAME: 415 West Washington ADDRESS: 415 W. Washington Ann Arbor, MI 48103 LAT/LONG: 42.2806 / -83.7521	CLIENT: Tetra Tech GEO CONTACT: Joy Gryzenia INQUIRY#: 3493977.4 RESEARCH DATE: 01/14/2013

Historical Topographic Map



N	ADJOINING QUAD NAME: SOUTH LYON MAP YEAR: 1906 SERIES: 15 SCALE: 1:62500	SITE NAME: 415 West Washington ADDRESS: 415 W. Washington Ann Arbor, MI 48103 LAT/LONG: 42.2806 / -83.7521	CLIENT: Tetra Tech GEO CONTACT: Joy Gryzenia INQUIRY#: 3493977.4 RESEARCH DATE: 01/14/2013

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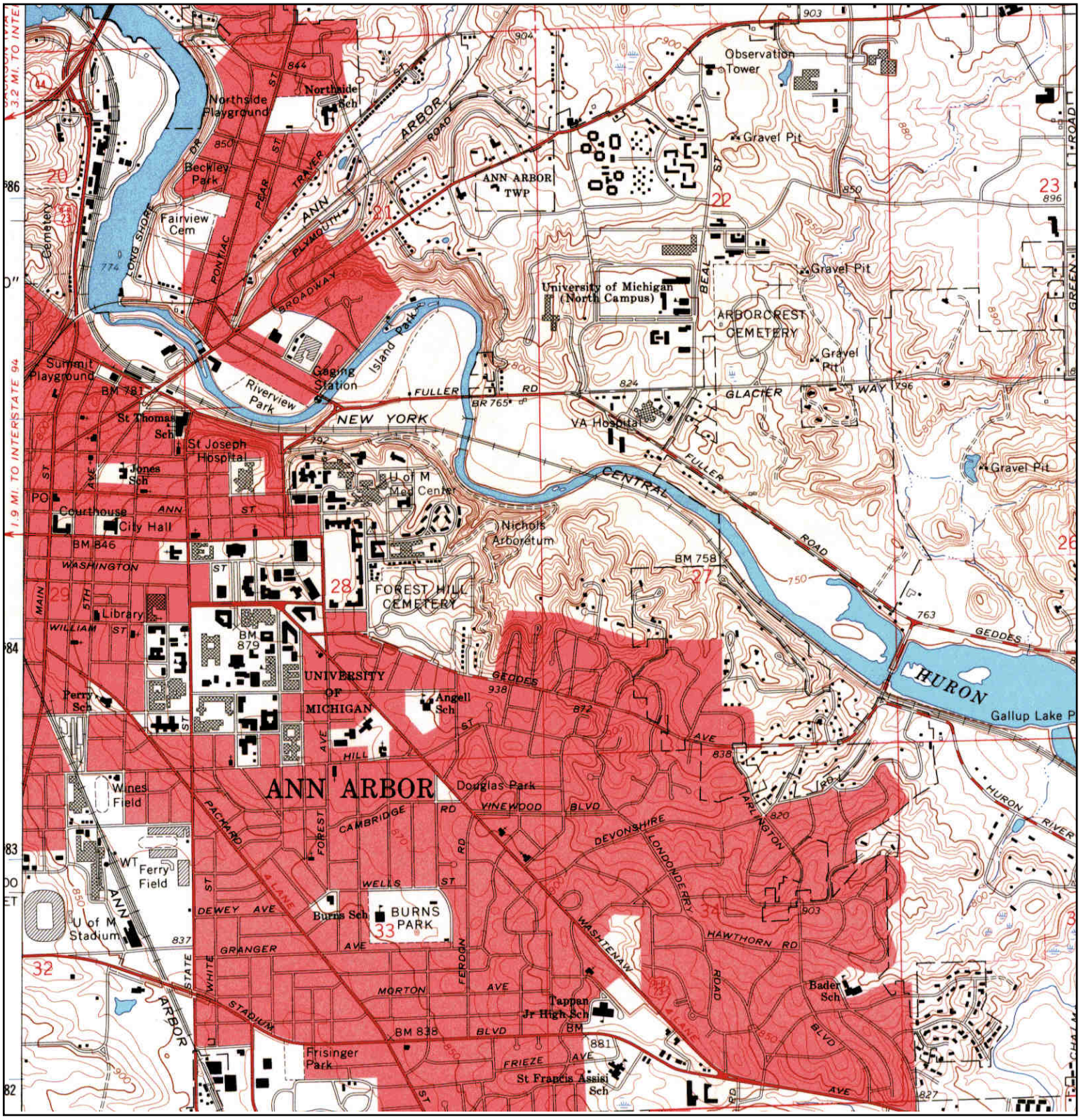

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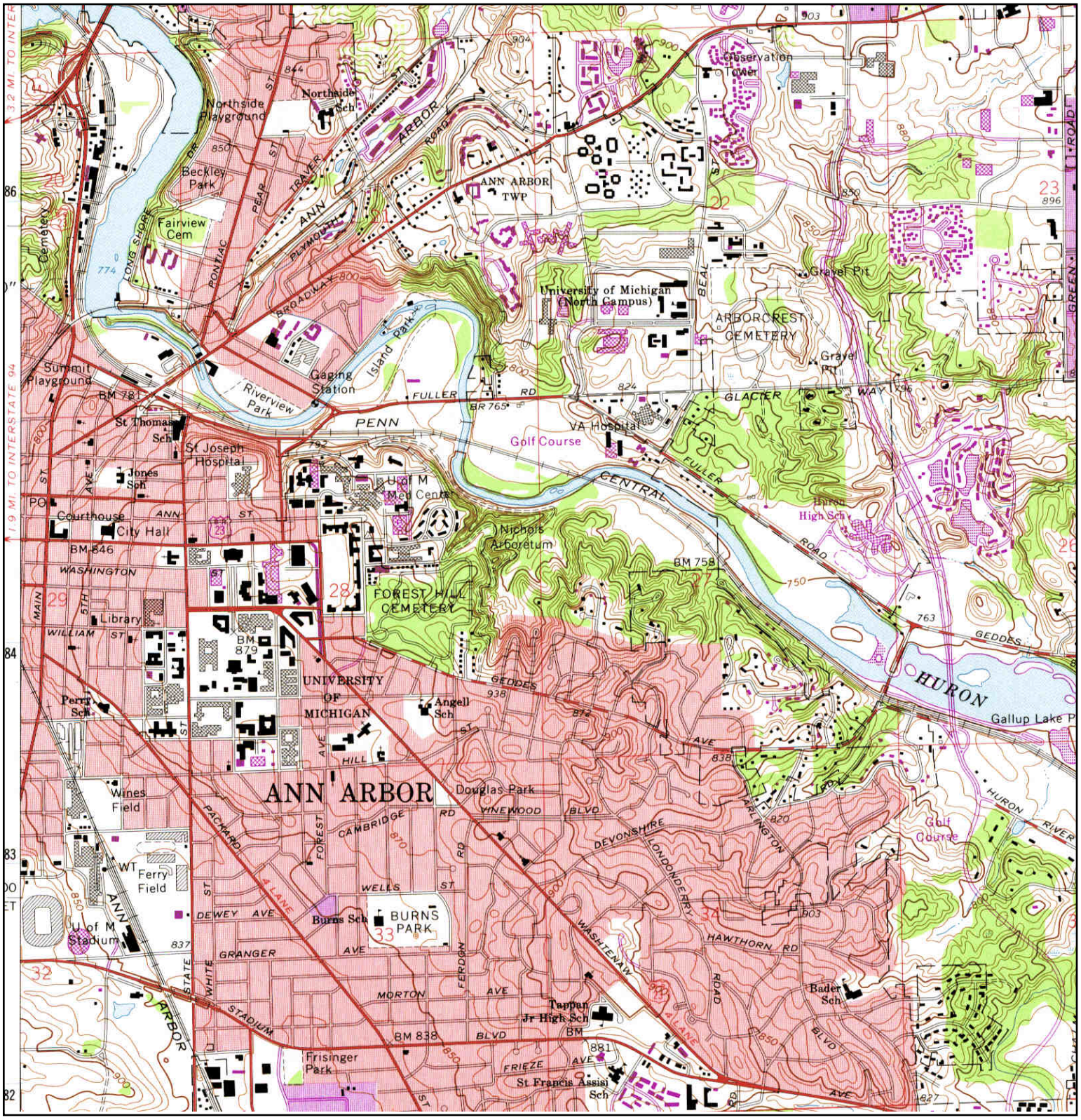
Historical Topographic Map



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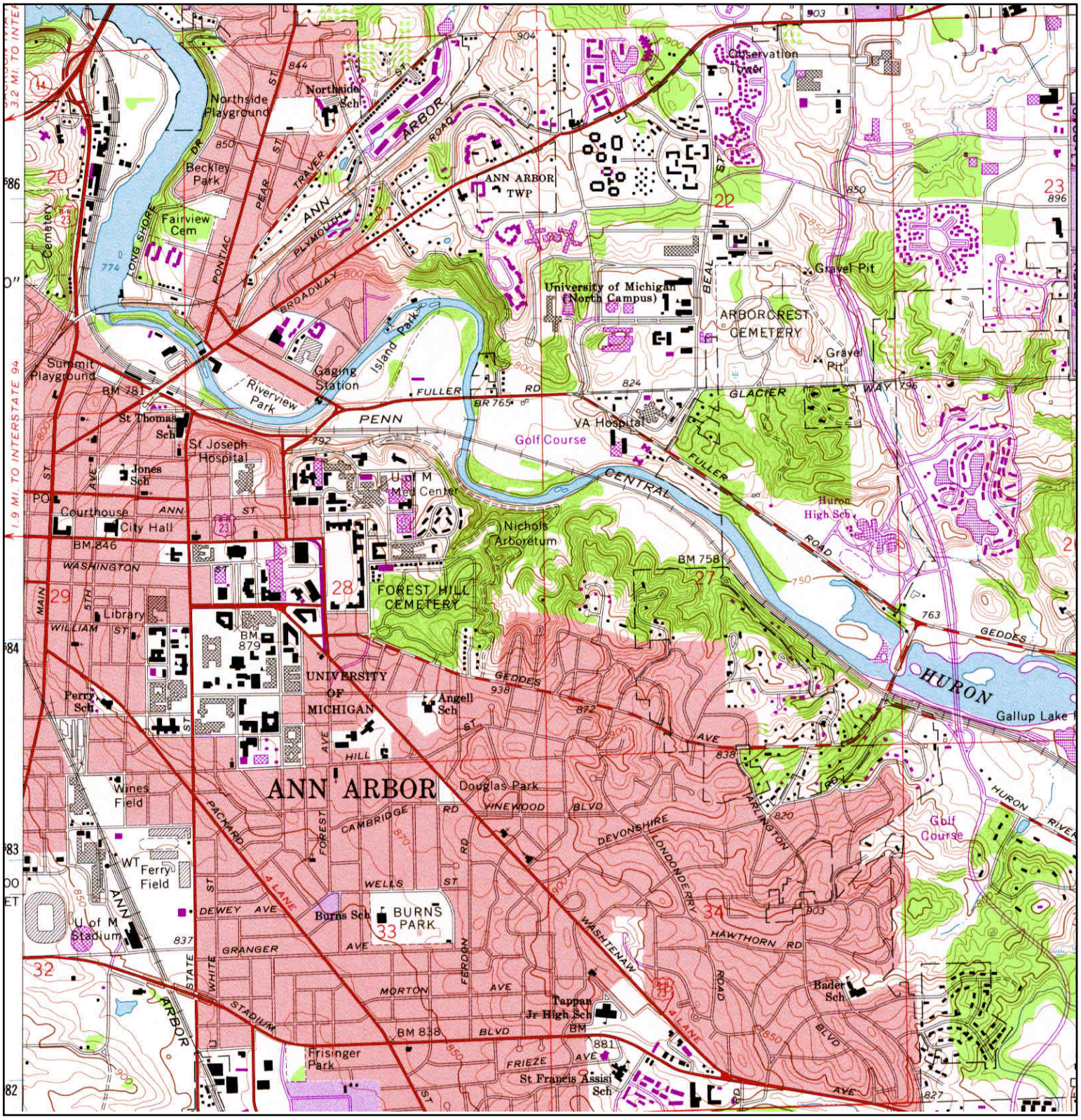
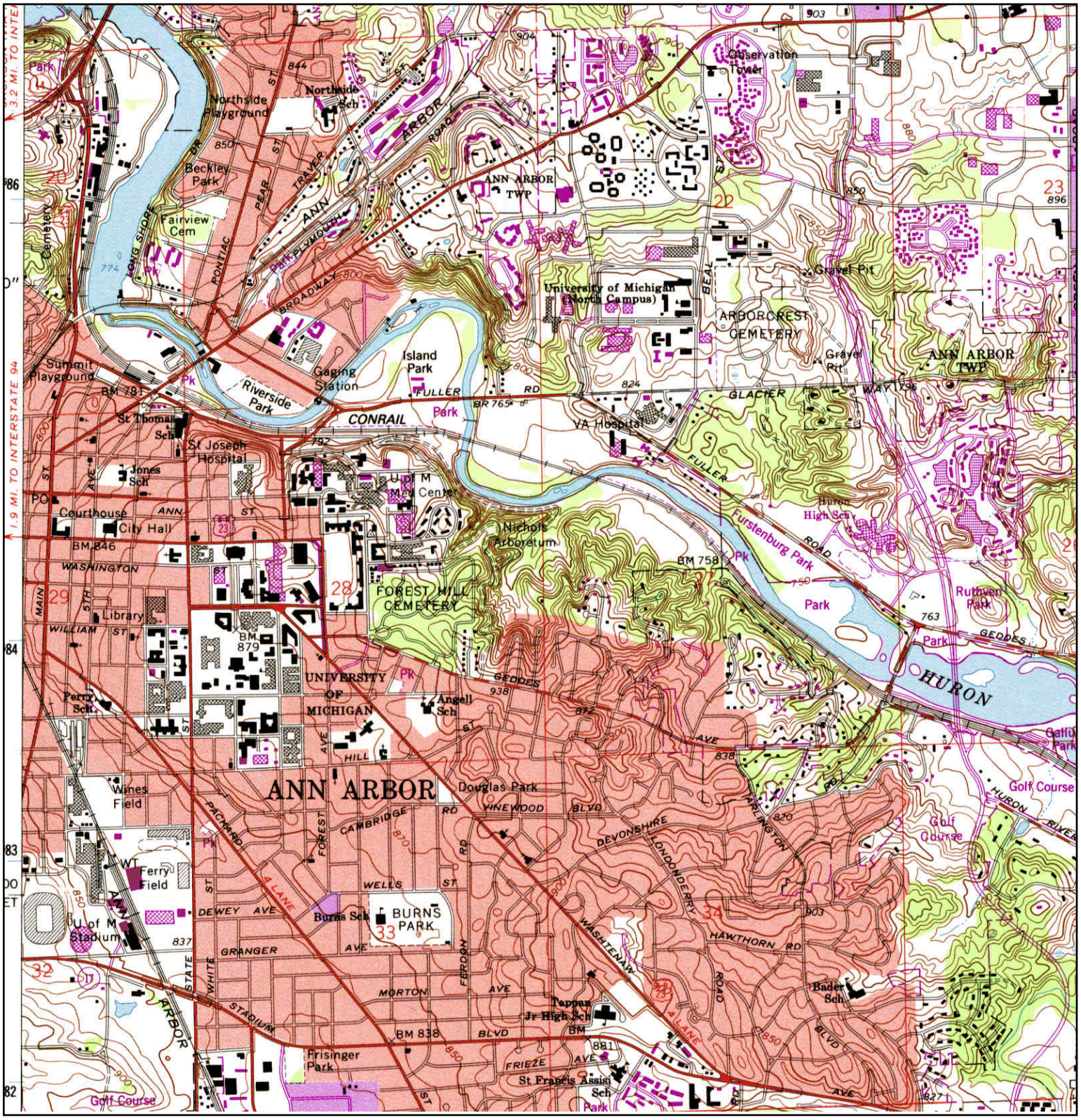
	NAME: ANN ARBOR EAST	SITE NAME: 415 West Washington	CLIENT: Tetra Tech GEO
	MAP YEAR: 1973	ADDRESS: 415 W. Washington	CONTACT: Joy Gryzenia
	PHOTOREVISED FROM :1965	Ann Arbor, MI 48103	INQUIRY#: 3493977.4
	SERIES: 7.5	LAT/LONG: 42.2806 / -83.7521	RESEARCH DATE: 01/14/2013
	SCALE: 1:24000		

Historical Topographic Map



N	ADJOINING QUAD		
	NAME: ANN ARBOR EAST	SITE NAME: 415 West Washington	CLIENT: Tetra Tech GEO
	MAP YEAR: 1978	ADDRESS: 415 W. Washington	CONTACT: Joy Gryzenia
	PHOTOINSPECTED FROM : 1965	Ann Arbor, MI 48103	INQUIRY#: 3493977.4
	SERIES: 7.5	LAT/LONG: 42.2806 / -83.7521	RESEARCH DATE: 01/14/2013
	SCALE: 1:24000		

Historical Topographic Map



N	ADJOINING QUAD				
	NAME:	ANN ARBOR EAST	SITE NAME:	415 West Washington	CLIENT: Tetra Tech GEO
	MAP YEAR:	1983	ADDRESS:	415 W. Washington	CONTACT: Joy Gryzenia
	PHOTOREVISED FROM :	1965		Ann Arbor, MI 48103	INQUIRY#: 3493977.4
	SERIES:	7.5	LAT/LONG:	42.2806 / -83.7521	RESEARCH DATE: 01/14/2013
	SCALE:	1:24000			

APPENDIX E

EDR SANBORN DOCUMENTATION

415 West Washington
415 W. Washington
Ann Arbor, MI 48103

Inquiry Number: 3493977.3
January 14, 2013

Certified Sanborn® Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

1/14/13

Site Name:
415 West Washington
415 W. Washington
Ann Arbor, MI 48103

Client Name:
Tetra Tech GEO
710 Avis Drive
Ann Arbor, MI 48108

EDR Inquiry # 3493977.3

Contact: Joy Gryzenia

EDR® Environmental Data Resources Inc

The complete Sanborn Library collection has been searched by EDR, and fire insurance maps covering the target property location provided by Tetra Tech GEO were identified for the years listed below. The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by Sanborn Library LLC, the copyright holder for the collection.

Certified Sanborn Results:

Site Name: 415 West Washington
Address: 415 W. Washington
City, State, Zip: Ann Arbor, MI 48103
Cross Street:
P.O. # NA
Project: 415 W. Washington
Certification # BEC6-4446-95D0

Maps Provided:

1972	1899
1948	1892
1931	1888
1925	
1916	
1908	

Sanborn® Library search results
Certification # BEC6-4446-95D0

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

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Sanborn Sheet Thumbnails

This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.

1972 Source Sheets

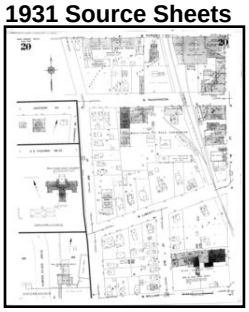
Volume 1, Sheet 20

1948 Source Sheets

Volume 1, Sheet 3

Volume 1, Sheet 20

1931 Source Sheets



Volume 1, Sheet 20

1925 Source Sheets

Volume 1, Sheet 3

1916 Source Sheets

Volume 1, Sheet 10

1908 Source Sheets

Volume 1, Sheet 6

1899 Source Sheets

Volume 1, Sheet 3

1892 Source Sheets

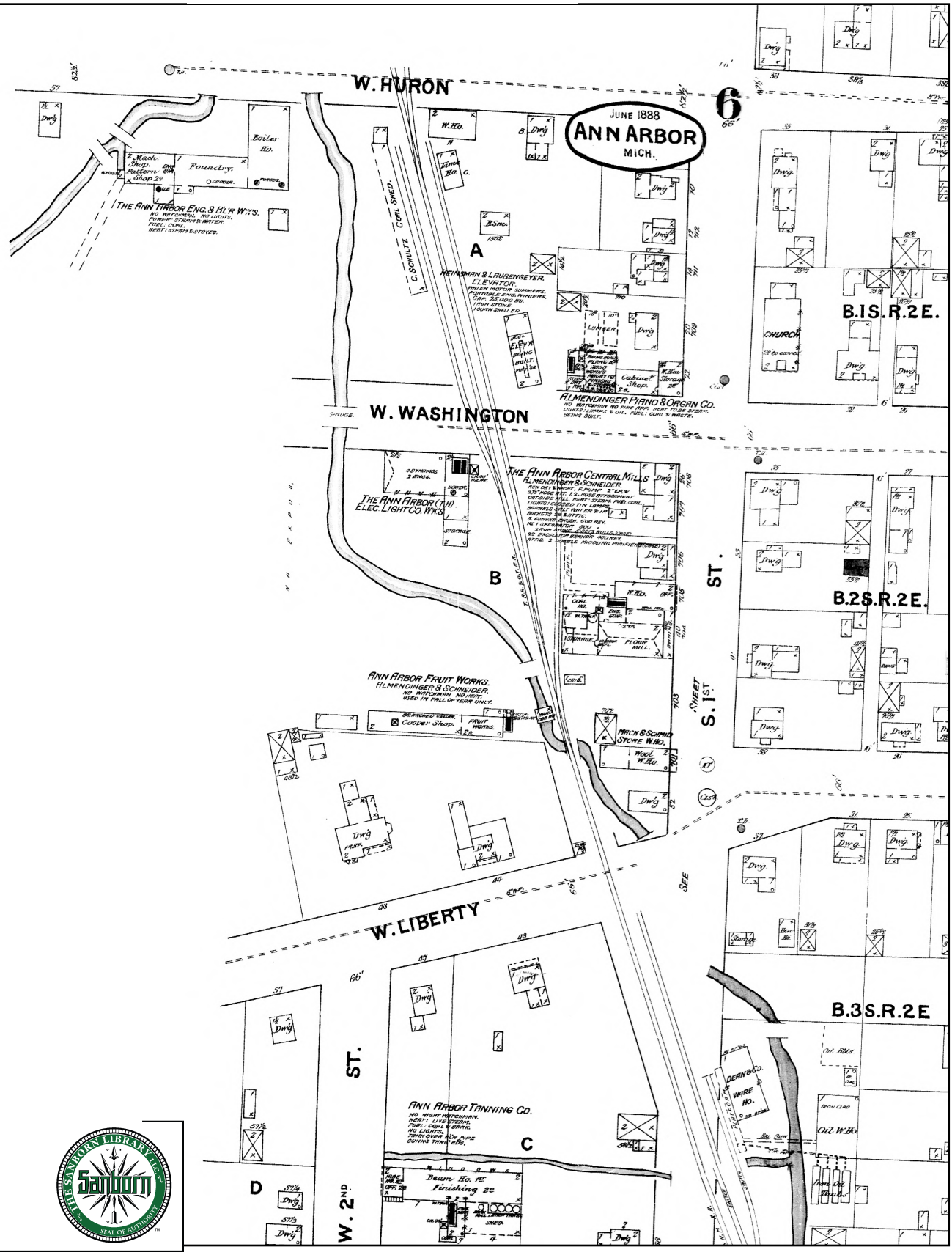
Volume 1, Sheet 10

1888 Source Sheets

Volume 1, Sheet 5

Volume 1, Sheet 6

1888 Certified Sanborn Map



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Certification # BEC6-4446-95D0

Site Name:	415 West Washington
Address:	415 W. Washington
City, ST, ZIP:	Ann Arbor MI 48103
Client:	Tetra Tech GEO
EDR Inquiry:	3493977.3
Order Date:	1/14/2013 2:16:01 PM
Certification #	BEC6-4446-95D0
Copyright:	1888

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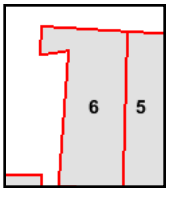

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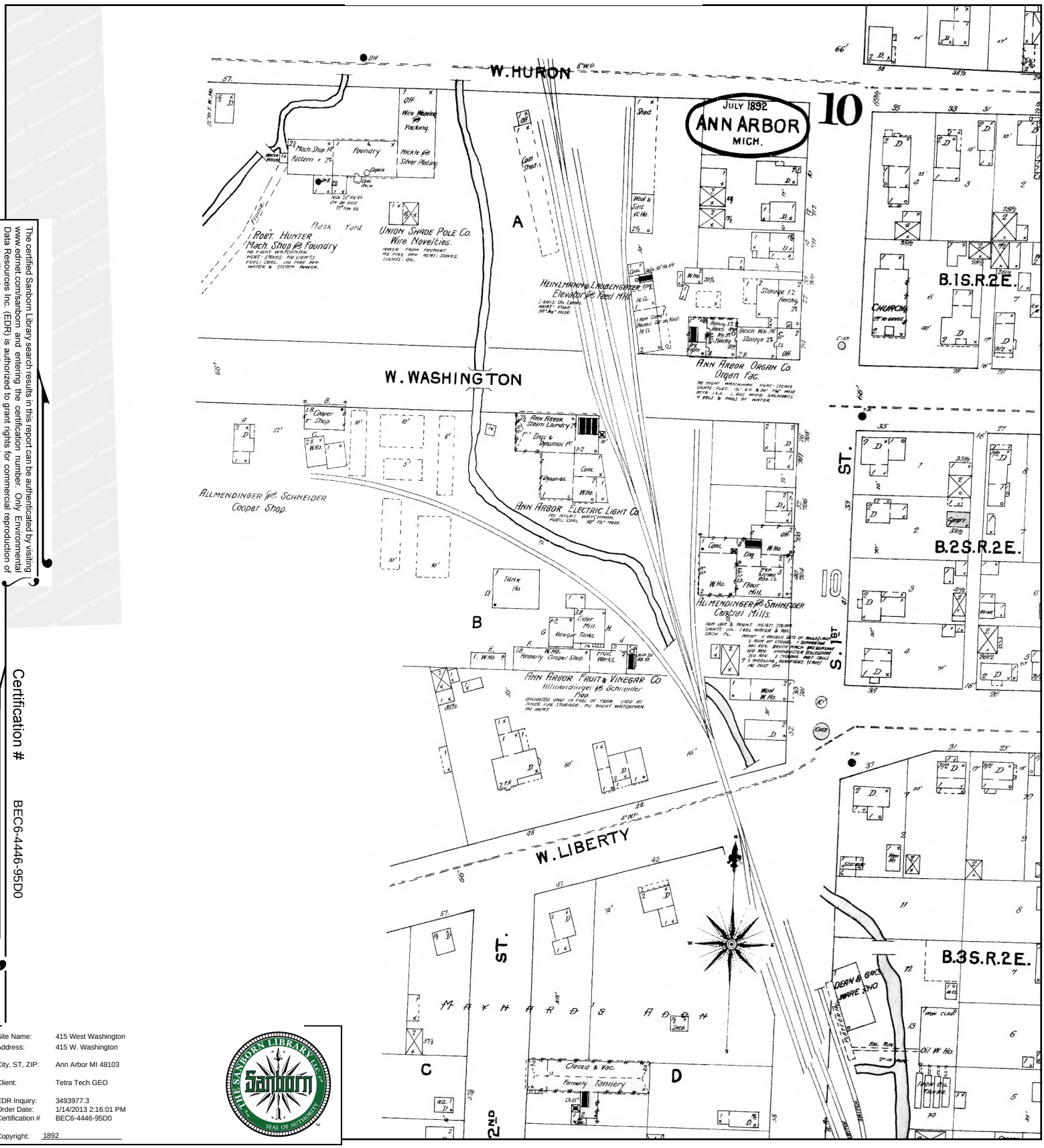
Volume 1, Sheet 6

N

1892 Certified Sanborn Map



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Client:	Tetra Tech GEO
EDR Inquiry:	3493977.3
Order Date:	1/14/2013 2:16:01 PM
Certification #	BEC6-4446-95D0
Copyright:	1892

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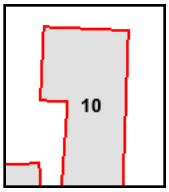

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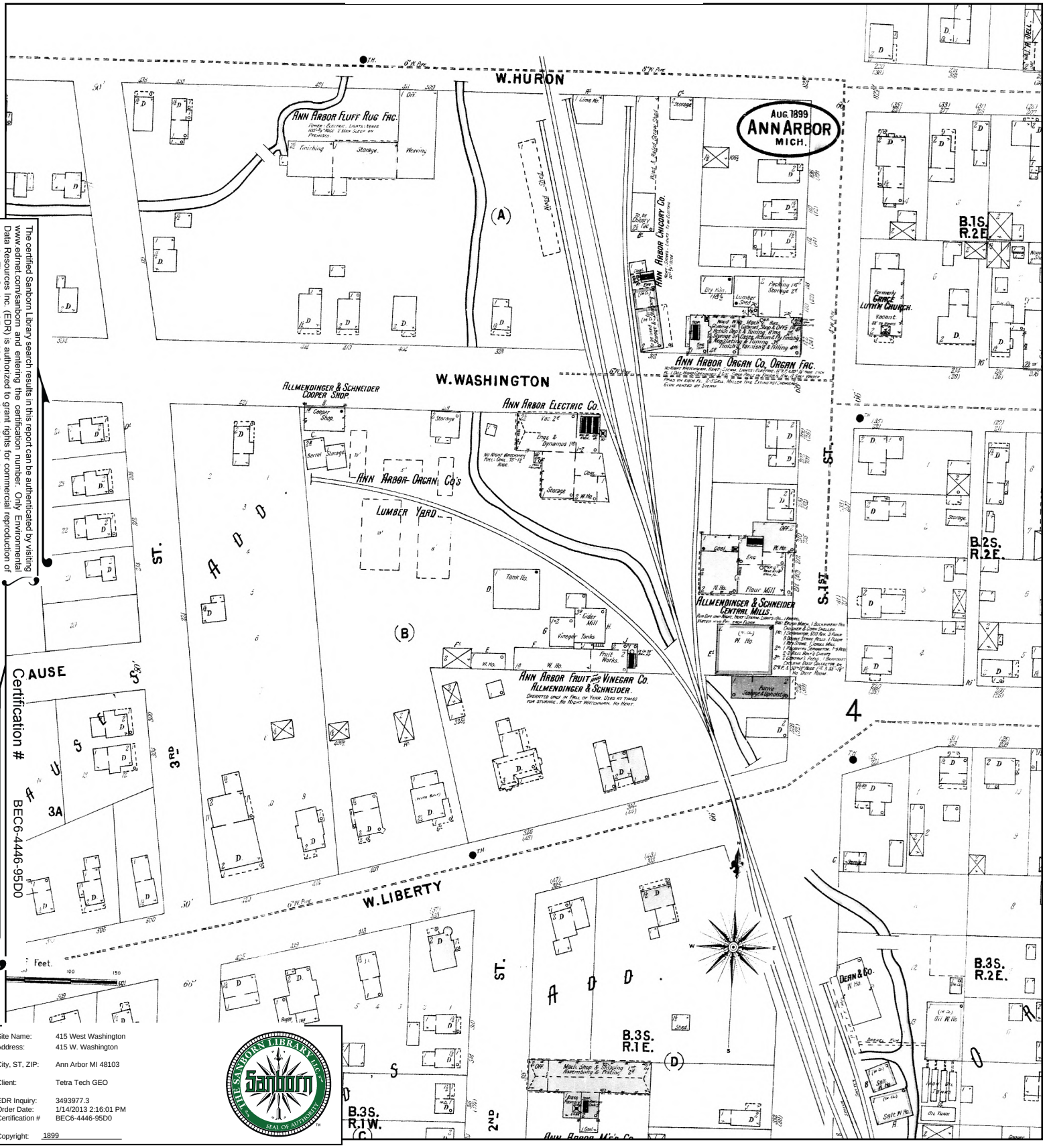

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Certification # BEC6-4446-95D0

Site Name:	415 West Washington
Address:	415 W. Washington
City, ST, ZIP:	Ann Arbor MI 48103
Client:	Tetra Tech GEO
EDR Inquiry:	3493977.3
Order Date:	1/14/2013 2:16:01 PM
Certification #	BEC6-4446-95D0
Copyright:	1899

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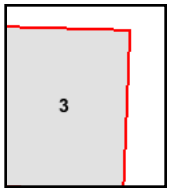

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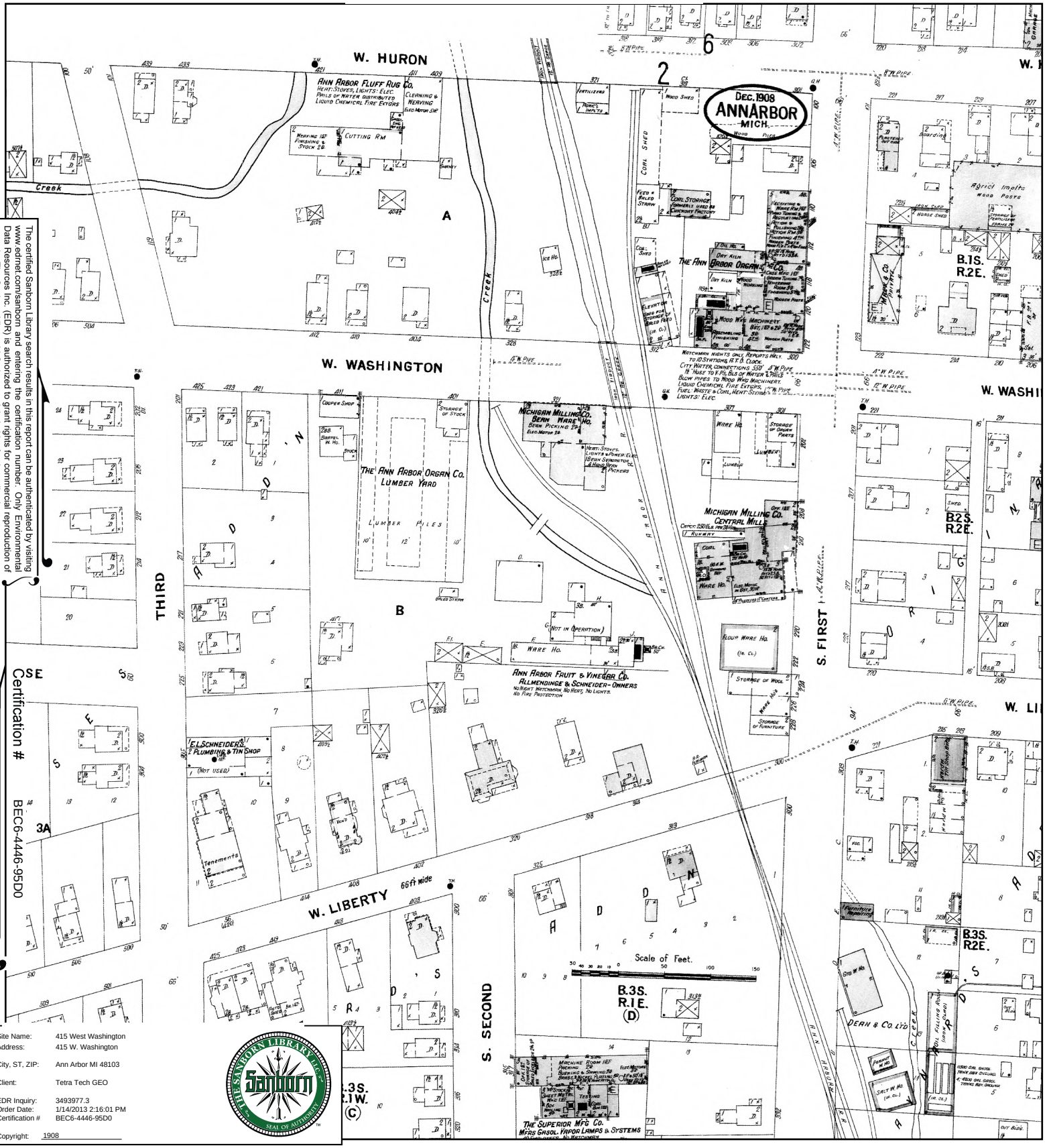

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City, ST, ZIP:	Ann Arbor MI 48103
Client:	Tetra Tech GEO
EDR Inquiry:	3493977.3
Order Date:	1/14/2013 2:16:01 PM
Certification #	BEC6-4446-95D0
Copyright:	1908

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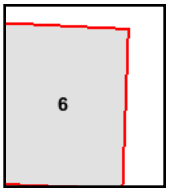

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0 Feet 150 300 600

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1916 Certified Sanborn Map

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Certification # BEC6-4446-95D0

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Address:	415 W. Washington
City, ST, ZIP:	Ann Arbor MI 48103
Client:	Tetra Tech GEO
EDR Inquiry:	3493977.3
Order Date:	1/14/2013 2:16:01 PM
Certification #	BEC6-4446-95D0
Copyright:	1916

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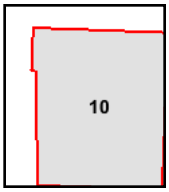

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0 Feet 150 300 600

1925 Certified Sanborn Map

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City, ST, ZIP:	Ann Arbor MI 48103
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Certification #	BEC6-4446-95D0
Copyright:	1925

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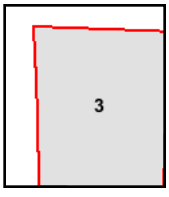

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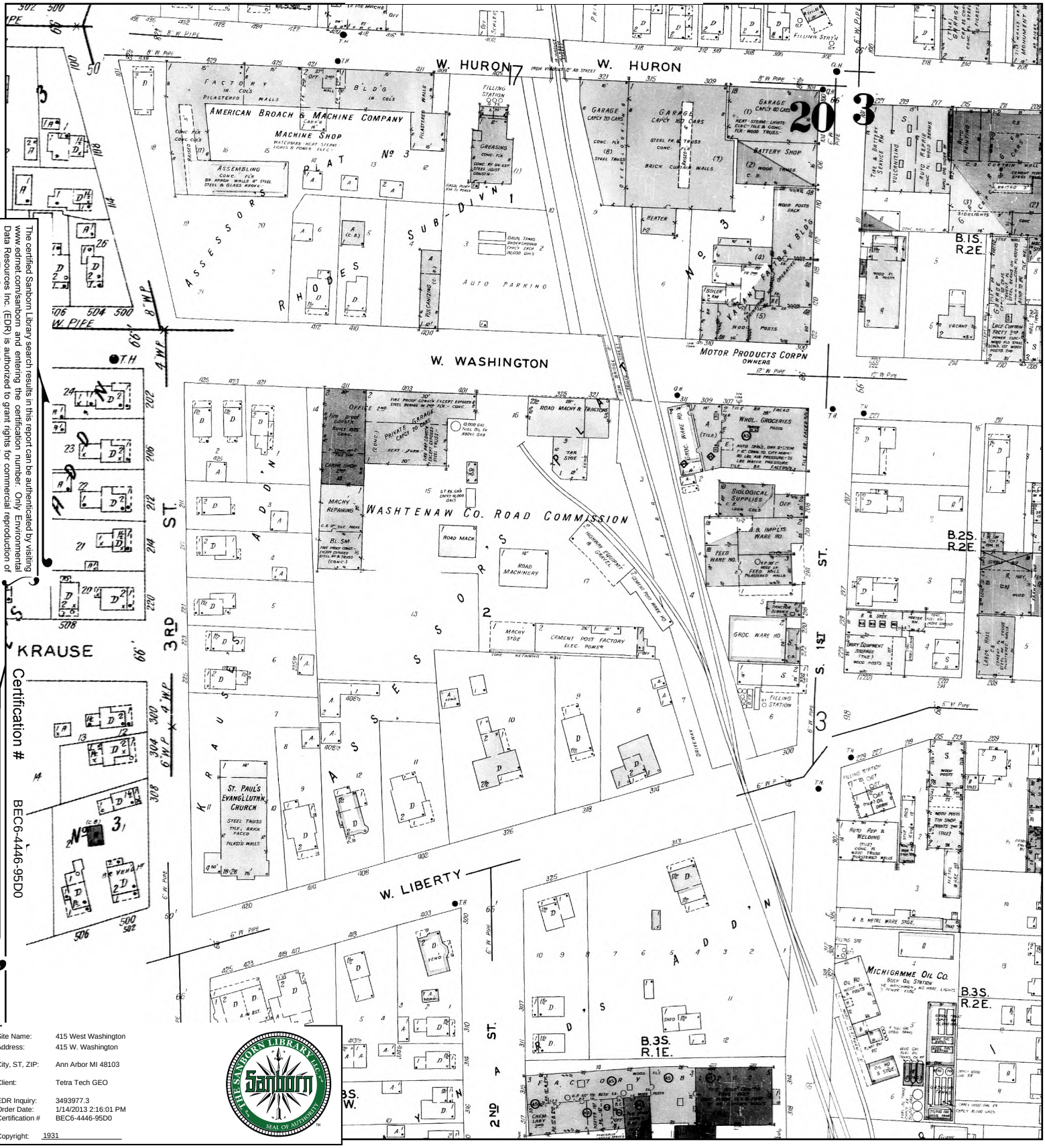
1931 Certified Sanborn Map



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Certification # BEC6-4446-95D0

Site Name:	415 West Washington
Address:	415 W. Washington
City, ST, ZIP:	Ann Arbor MI 48103
Client:	Tetra Tech GEO
EDR Inquiry:	3493977.3
Order Date:	1/14/2013 2:16:01 PM
Certification #	BEC6-4446-95D0
Copyright:	1931

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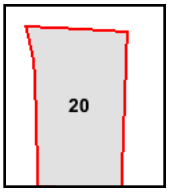

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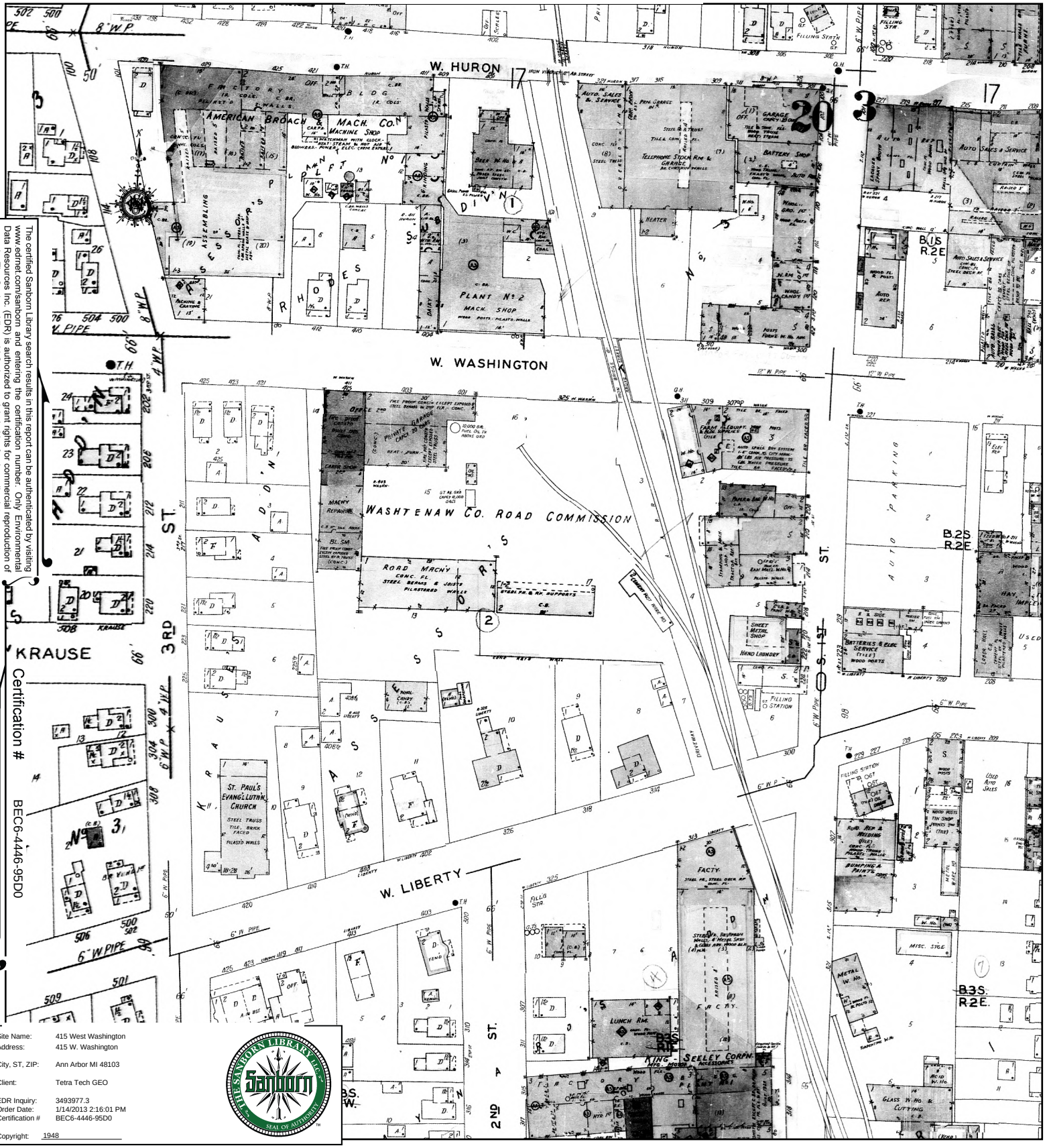
1948 Certified Sanborn Map



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Certification #	BEC6-4446-95D0
Copyright:	1948

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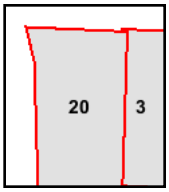

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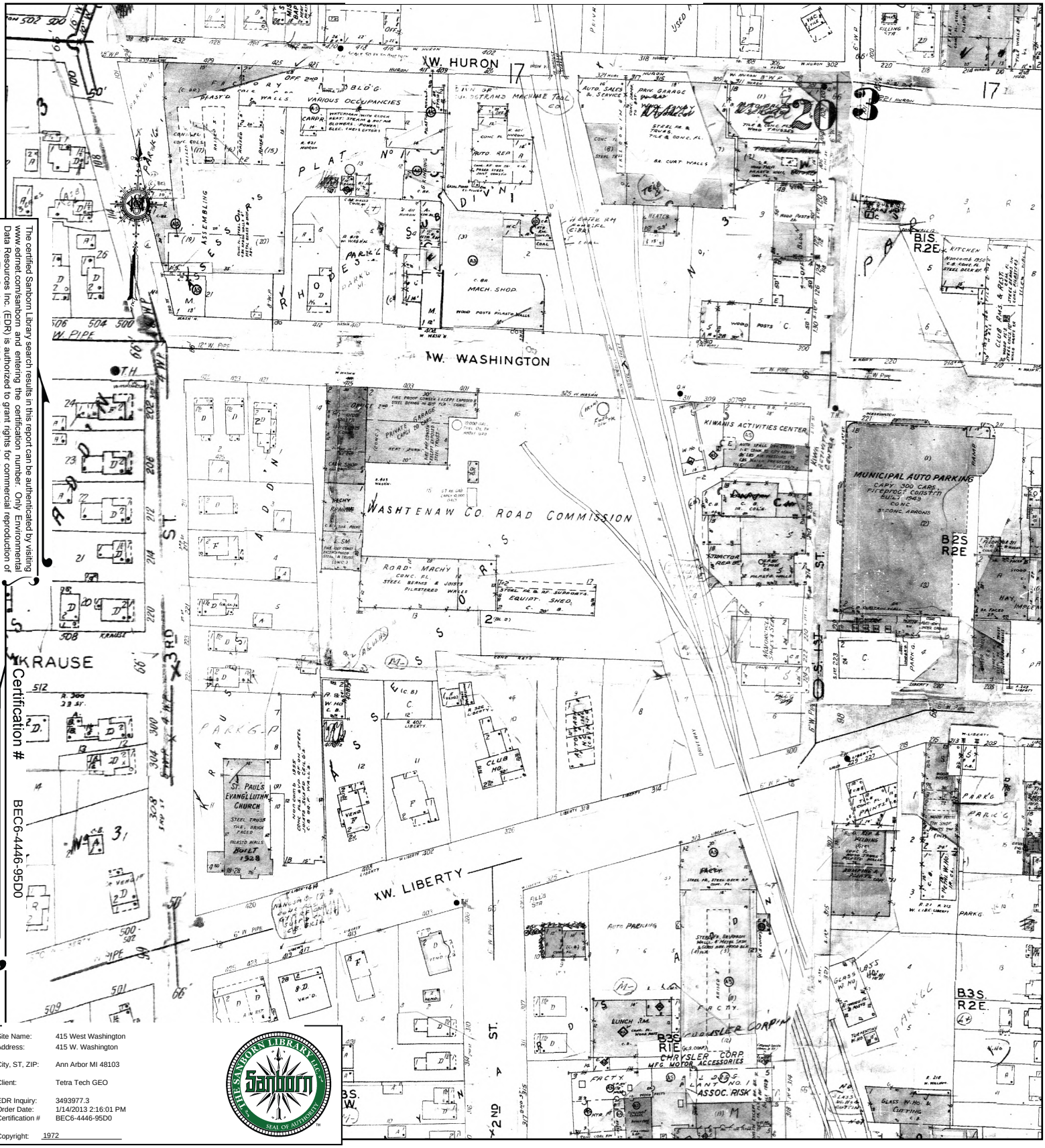
N

1972 Certified Sanborn Map



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Certification #	BEC6-4446-95D0
Copyright:	1972

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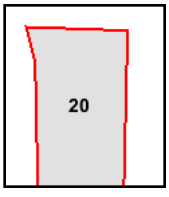

Volume 1, Sheet 20

0 Feet 150 300 600

N

APPENDIX F

EDR CITY DIRECTORIES

415 West Washington
415 W. Washington
Ann Arbor, MI 48103

Inquiry Number: 3493977.6
January 16, 2013

The EDR-City Directory Image Report

Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

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City Directory Images

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	Target Street	Cross Street	Source
2012	☑	☐	Polk's City Directory
2007	☑	☐	Polk's City Directory
2001	☑	☐	Polk's City Directory
1995	☑	☐	Polk's City Directory
1992	☑	☐	Polk's City Directory
1988	☑	☐	Polk's City Directory
1983	☑	☐	Polk's City Directory
1978	☑	☐	Polk's City Directory
1973	☑	☐	Polk's City Directory
1968	☑	☐	Polk's City Directory
1963	☑	☐	Polk's City Directory
1958	☑	☐	Polk's City Directory
1954	☑	☐	Polk's City Directory
1949	☑	☐	Polk's City Directory
1945	☑	☐	Polk's City Directory
1940	☑	☐	Polk's City Directory
1936	☑	☐	Polk's City Directory
1932	☑	☐	Polk's City Directory
1927	☑	☐	Polk's City Directory
1920	☑	☐	Polk's City Directory
1915	☑	☐	Polk's City Directory
1910	☐	☐	Polk's City Directory
1903	☐	☐	Polk's City Directory

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FINDINGS

TARGET PROPERTY STREET

415 W. Washington
Ann Arbor, MI 48103

Year	*CD Image*	*Source*	
W. Washington			
2012	pg A1	Polk's City Directory	
2007	pg A2	Polk's City Directory	
2001	pg A3	Polk's City Directory	
1995	pg A4	Polk's City Directory	
1992	pg A5	Polk's City Directory	
1988	pg A6	Polk's City Directory	
1983	pg A7	Polk's City Directory	
1978	pg A8	Polk's City Directory	
1978	pg A9	Polk's City Directory	
1973	pg A10	Polk's City Directory	
1968	pg A11	Polk's City Directory	
1963	pg A12	Polk's City Directory	
1958	pg A13	Polk's City Directory	
1958	pg A14	Polk's City Directory	
1954	pg A15	Polk's City Directory	
1949	pg A16	Polk's City Directory	
1945	pg A17	Polk's City Directory	
1945	pg A18	Polk's City Directory	
1940	pg A19	Polk's City Directory	
1936	pg A20	Polk's City Directory	
1932	pg A21	Polk's City Directory	
1927	pg A22	Polk's City Directory	
1920	pg A23	Polk's City Directory	
1915	pg A24	Polk's City Directory	
1910	-	Polk's City Directory	Target and Adjoining not listed in Source
1903	-	Polk's City Directory	Target and Adjoining not listed in Source

FINDINGS

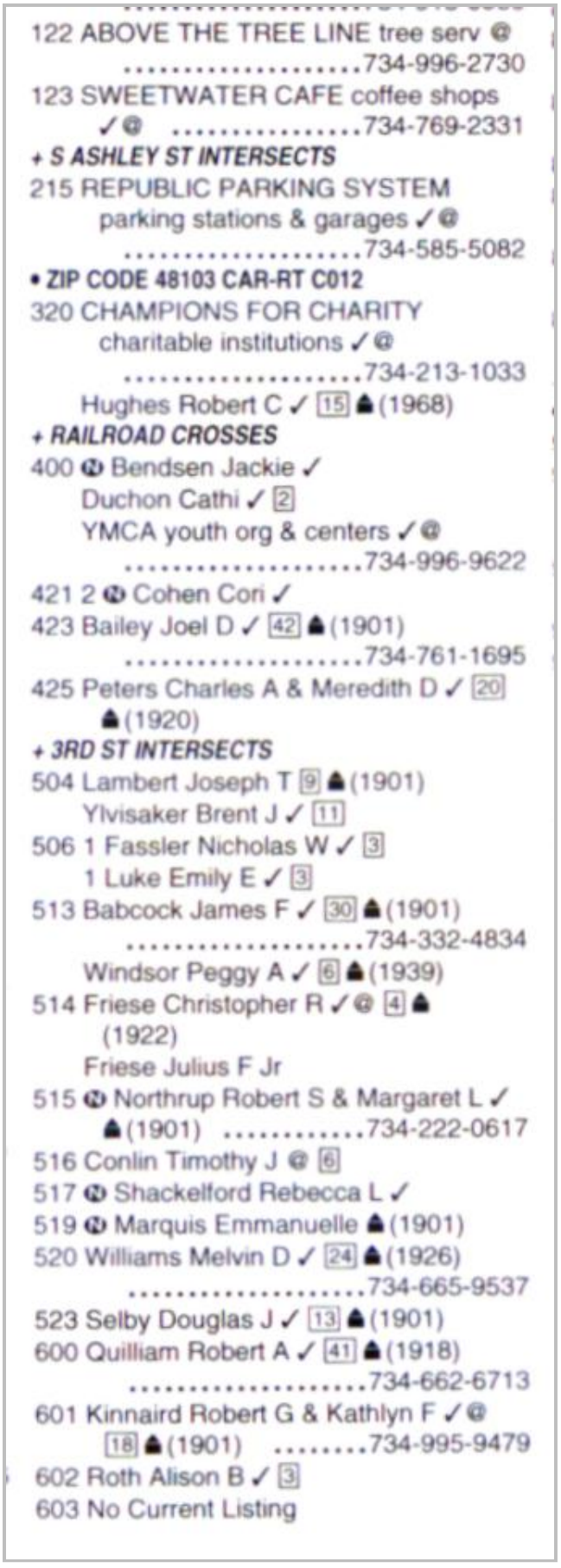
CROSS STREETS

No Cross Streets Identified

City Directory Images

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 2012



122 ABOVE THE TREE LINE tree serv @
.....734-996-2730
123 SWEETWATER CAFE coffee shops
✓@ 734-769-2331
+ S ASHLEY ST INTERSECTS
215 REPUBLIC PARKING SYSTEM
parking stations & garages ✓@
.....734-585-5082
• ZIP CODE 48103 CAR-RT C012
320 CHAMPIONS FOR CHARITY
charitable institutions ✓@
.....734-213-1033
Hughes Robert C ✓ 15 ▲(1968)
+ RAILROAD CROSSES
400 Ⓦ Bendsen Jackie ✓
Duchon Cathi ✓ 2
YMCA youth org & centers ✓@
.....734-996-9622
421 2 Ⓦ Cohen Cori ✓
423 Bailey Joel D ✓ 42 ▲(1901)
.....734-761-1695
425 Peters Charles A & Meredith D ✓ 20
▲(1920)
+ 3RD ST INTERSECTS
504 Lambert Joseph T 9 ▲(1901)
Ylvisaker Brent J ✓ 11
506 1 Fassler Nicholas W ✓ 3
1 Luke Emily E ✓ 3
513 Babcock James F ✓ 30 ▲(1901)
.....734-332-4834
Windsor Peggy A ✓ 6 ▲(1939)
514 Friese Christopher R ✓@ 4 ▲
(1922)
Friese Julius F Jr
515 Ⓦ Northrup Robert S & Margaret L ✓
▲(1901) 734-222-0617
516 Conlin Timothy J @ 6
517 Ⓦ Shackelford Rebecca L ✓
519 Ⓦ Marquis Emmanuelle ▲(1901)
520 Williams Melvin D ✓ 24 ▲(1926)
.....734-665-9537
523 Selby Douglas J ✓ 13 ▲(1901)
600 Quilliam Robert A ✓ 41 ▲(1918)
.....734-662-6713
601 Kinnaird Robert G & Kathlyn F ✓@
18 ▲(1901) 734-995-9479
602 Roth Alison B ✓ 3
603 No Current Listing

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 2007

122 ABOVE THE TREE LINE tree serv 734-996-2730

123 SWEETWATER CAFE'S restaurants 734-769-2331

+ ***S ASHLEY ST INTERSECTS***

• **ZIP CODE 48103 CAR-RT C008**

314 COMERICA BANK banks 734-761-3707

320 Hughes Robert C & Jane H [10] ▲

OPUS MIME entertainers- family & business 734-730-2164

ORGANIZATIONAL DESIGNS int decrtrs design/consultants 734-662-9458

+ ***RAILROAD CROSSES***

400 YMCA child care serv ..734-996-9622

415 ANN ARBOR FORESTRY SVC government- forestry serv 734-994-2769

ANN ARBOR PARK MAINTENANCE cemeteries 734-994-2768

FAIRVIEW CEMETERY government offices 734-994-2780

421 No Current Listing

423 Bailey Joel D [37] ▲ 734-761-1695

425 Peters Charles A [15] ▲

Peters Charlesa

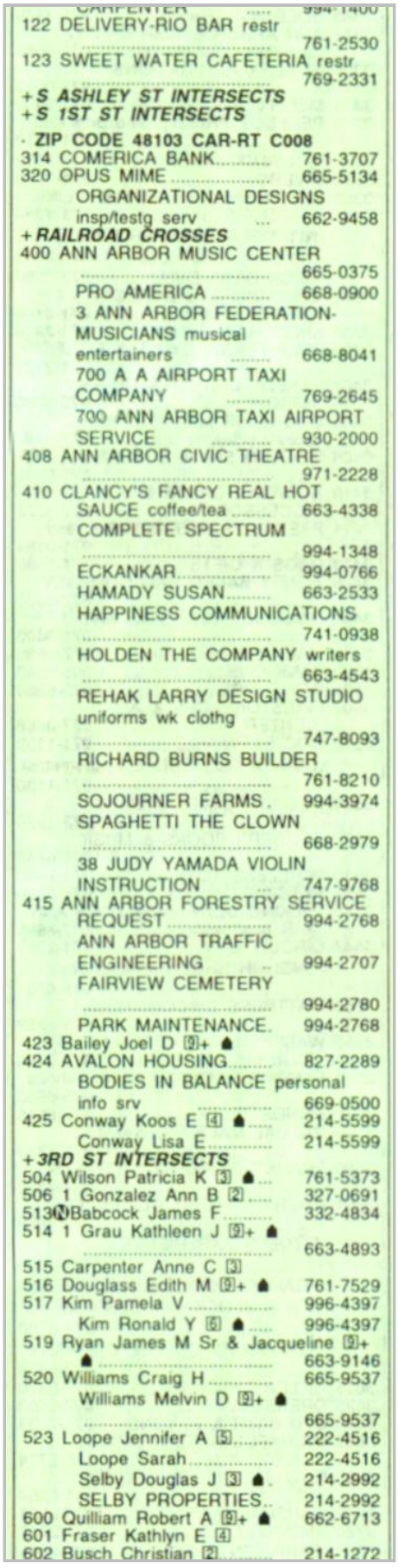
+ ***3RD ST INTERSECTS***

504 Ⓝ Victor Allen L

506 No Current Listing

Target Street	Cross Street	Source
✓	-	Polk's City Directory

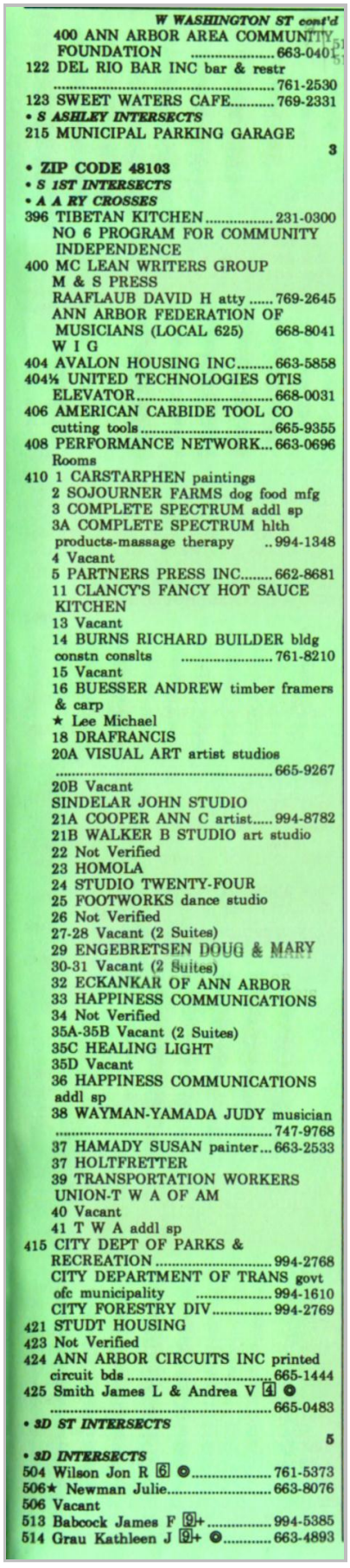
W. Washington 2001



CARPENTER 994-1400
122 DELIVERY-RIO BAR restr
..... 761-2530
123 SWEET WATER CAFETERIA restr
..... 769-2331
+S ASHLEY ST INTERSECTS
+S 1ST ST INTERSECTS
· ZIP CODE 48103 CAR-RT C008
314 COMERICA BANK..... 761-3707
320 OPUS MIME 665-5134
ORGANIZATIONAL DESIGNS
insp/testg serv ... 662-9458
+RAILROAD CROSSES
400 ANN ARBOR MUSIC CENTER
..... 665-0375
PRO AMERICA 668-0900
3 ANN ARBOR FEDERATION-
MUSICIANS musical
entertainers 668-8041
700 A A AIRPORT TAXI
COMPANY 769-2645
700 ANN ARBOR TAXI AIRPORT
SERVICE 930-2000
408 ANN ARBOR CIVIC THEATRE
..... 971-2228
410 CLANCY'S FANCY REAL HOT
SAUCE coffee/tea 663-4338
COMPLETE SPECTRUM
..... 994-1348
ECKANKAR..... 994-0766
HAMADY SUSAN..... 663-2533
HAPPINESS COMMUNICATIONS
..... 741-0938
HOLDEN THE COMPANY writers
..... 663-4543
REHAK LARRY DESIGN STUDIO
uniforms wk clothg
..... 747-8093
RICHARD BURNS BUILDER
..... 761-8210
SOJOURNER FARMS . 994-3974
SPAGHETTI THE CLOWN
..... 668-2979
38 JUDY YAMADA VIOLIN
INSTRUCTION ... 747-9768
415 ANN ARBOR FORESTRY SERVICE
REQUEST 994-2768
ANN ARBOR TRAFFIC
ENGINEERING .. 994-2707
FAIRVIEW CEMETERY
..... 994-2780
PARK MAINTENANCE. 994-2768
423 Bailey Joel D [9]+ ☗
424 AVALON HOUSING..... 827-2289
BODIES IN BALANCE personal
info srv 669-0500
425 Conway Koos E [4] ☗..... 214-5599
Conway Lisa E..... 214-5599
+3RD ST INTERSECTS
504 Wilson Patricia K [3] ☗... 761-5373
506 1 Gonzalez Ann B [2]..... 327-0691
513 Babcock James F..... 332-4834
514 1 Grau Kathleen J [9]+ ☗
..... 663-4893
515 Carpenter Anne C [3]
516 Douglass Edith M [9]+ ☗ 761-7529
517 Kim Pamela V 996-4397
Kim Ronald Y [6] ☗..... 996-4397
519 Ryan James M Sr & Jacqueline [9]+
☗ 663-9146
520 Williams Craig H 665-9537
Williams Melvin D [9]+ ☗
..... 665-9537
523 Loope Jennifer A [5]..... 222-4516
Loope Sarah..... 222-4516
Selby Douglas J [3] ☗. 214-2992
SELBY PROPERTIES.. 214-2992
600 Quilliam Robert A [9]+ ☗ 662-6713
601 Fraser Kathlyn E [4]
602 Busch Christian [2]..... 214-1272

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1995



W WASHINGTON ST cont'd
400 ANN ARBOR AREA COMMUNITY FOUNDATION 663-0401
122 DEL RIO BAR INC bar & restr 761-2530
123 SWEET WATERS CAFE..... 769-2331
• S ASHLEY INTERSECTS
215 MUNICIPAL PARKING GARAGE
3
• ZIP CODE 48103
• S 1ST INTERSECTS
• A A RY CROSSES
396 TIBETAN KITCHEN 231-0300
NO 6 PROGRAM FOR COMMUNITY INDEPENDENCE
400 MC LEAN WRITERS GROUP
M & S PRESS
RAAFLAUB DAVID H atty 769-2645
ANN ARBOR FEDERATION OF MUSICIANS (LOCAL 625) 668-8041
W I G
404 AVALON HOUSING INC..... 663-5858
404½ UNITED TECHNOLOGIES OTIS ELEVATOR..... 668-0031
406 AMERICAN CARBIDE TOOL CO cutting tools..... 665-9355
408 PERFORMANCE NETWORK... 663-0696
Rooms
410 1 CARSTARPHEN paintings
2 SOJOURNER FARMS dog food mfg
3 COMPLETE SPECTRUM addl sp
3A COMPLETE SPECTRUM hlth products-massage therapy ..994-1348
4 Vacant
5 PARTNERS PRESS INC..... 662-8681
11 CLANCY'S FANCY HOT SAUCE KITCHEN
13 Vacant
14 BURNS RICHARD BUILDER bldg constn conslts 761-8210
15 Vacant
16 BUESSER ANDREW timber framers & carp
★ Lee Michael
18 DRAFRANCIS
20A VISUAL ART artist studios 665-9267
20B Vacant
SINDELAR JOHN STUDIO
21A COOPER ANN C artist..... 994-8782
21B WALKER B STUDIO art studio
22 Not Verified
23 HOMOLA
24 STUDIO TWENTY-FOUR
25 FOOTWORKS dance studio
26 Not Verified
27-28 Vacant (2 Suites)
29 ENGEBRETSEN DOUG & MARY
30-31 Vacant (2 Suites)
32 ECKANKAR OF ANN ARBOR
33 HAPPINESS COMMUNICATIONS
34 Not Verified
35A-35B Vacant (2 Suites)
35C HEALING LIGHT
35D Vacant
36 HAPPINESS COMMUNICATIONS addl sp
38 WAYMAN-YAMADA JUDY musician 747-9768
37 HAMADY SUSAN painter... 663-2533
37 HOLTFRETTER
39 TRANSPORTATION WORKERS UNION-T W A OF AM
40 Vacant
41 T W A addl sp
415 CITY DEPT OF PARKS & RECREATION 994-2768
CITY DEPARTMENT OF TRANS govt ofc municipality 994-1610
CITY FORESTRY DIV..... 994-2769
421 STUDT HOUSING
423 Not Verified
424 ANN ARBOR CIRCUITS INC printed circuit bds 665-1444
425 Smith James L & Andrea V 4 665-0483
• 3D ST INTERSECTS
5
• 3D INTERSECTS
504 Wilson Jon R 6 761-5373
506★ Newman Julie..... 663-8076
506 Vacant
513 Babcock James F 9+ 994-5385
514 Grau Kathleen J 9+ 663-4893

Target Street	Cross Street	Source
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E WASHINGTON ST–Contd

105 Ponitz Robt J dentist 663-2545
106 Cohen Rachel psychologist 741-0039
106 Shoemaker Diane A C S W socl wkr 663-0193
106 Dunning Sally M S W socl wkr 996-9992
106 Falkner David V psychologist 995-9965
107 Falit Harvey H phys 662-1668
200h Ehrlich Joshua psychologist 663-7839
201 Davey Paula G phys 662-3384
202n Trivedi Gail H social wkr 996-9077
202s Woodard G Martin certifield social wkr 668-8846
203 Blogin Craig L dentist 747-6777
203 Pelzar Robt J dentist 747-6777
204 Vacant
205 Alpine Keith D dentist 761-1122
205 Kolling Josef N dentist 761-1122
206 Tuta Kathleen M 662-8665
206 Krone Geoffrey psychologist 662-8665
206 Lewis-Stone Carolyn socl wkr 668-6570
207 Collins Dental Laboratory 665-7105
SS TALLY HALL (WASHINGTON ST ENTRANCE)
514 Talbots the women's clo 994-8686
516 Laura Ashley Inc women's clo 747-6620
518 Geri's Boutique 662-0886
600 Studt Housing
602 Studt House
604 Studt Housing
606 Studt House
S STATE INTERSECTS

24

ZIP CODE 48109
S THAYER ST INTERSECTS
812 U of M Modern Languages Bldg
915 U of M Rackham Building 764-4415
FLETCHER ST INTERSECTS

1

WASHINGTON ST W –FROM 200 S MAIN WEST

ZIP CODE 48103
112 Vacant
113 Vogel's Lock & Safe Co Inc 668-6863
114 I R I E Computer 665-5115
115 Flame the tavern 662-9680
116★Chaudhuri Anthony K ◉ 665-5117
117 Fresh Cream Cafe ice cream & lunch counter 665-8959
117½ Miller David 668-1788
119 Vacant
120 Old German Restaurant 662-0737
120½ Organizational Designs Inc 662-9458
Mitchell Associates archts 662-6070
121 Earle Building
Suites
Level Earle the restr 994-0211
200 Schlecte Wm M & Assocs P C 662-9044
200 Professional Learning Netwk Inc 663-9890
200 Voice Technology Inc tel answering serv 665-4600
200 Citadel Commercial Group Inc real est 665-4600
200 Cooper Straub Walinski & Cramer lwyrs 663-6535
121 Berggren Kurt lwyr 996-0722
300 Harris Guenzel Meier & Nichols P C lwyrs 994-3000
400 Foster Magill & Rumsey lwyrs 995-3110
400 Ann Arbor Area Community Foundation 663-0401
122 Del Rio Bar Inc bar & restr 761-2530
123 Ann Arbor Glassworks 769-0242
S ASHLEY INTERSECTS
215 Municipal Parking Garage permit parking only

3

ZIP CODE 48103
S 1ST INTERSECTS
A A RY CROSSES
396 Blossom Foods Inc caterers 995-5224
Swan Production film editor 769-7423
2 Wiesmeyer Kim artist 769-0692
Lisa Wolf pianist 665-6231
6 Taylor T S electronics repr 994-8788
400 Washknaw Intermediate Sch Dist pub sch 761-7667
7 John Sorsey drummer 668-1454
36 Eaton Judy photog 663-0824
Ann Arbor Mime Works 994-8795
Ann Arbor Federation of Musicians (Local 625) 668-8041
Printech Computer Products Inc computer prod 994-3332
404 Seyfried Printing Co 662-0231
404½ Otis Elevator Company elevator mtce serv 668-8316
406 American Carbide Tool Co cutting tools 665-9355
408 Performance Network theater productions 663-0681
Rooms
1 Kaplan Adrienne graphic art designer 662-1817
2 Reynolds Greg photog 747-7363
3 Complete Spectrum addl sp
3a Complete Spectrum hlth products-massage therapy 994-1348
5 Partners Press Inc genl coml prnts 662-8681
9 Technology Center Ofc landlord of technology cntr 994-8791
3 Vacant
1 Bell Elizabeth drummer studio
2 Vacant
9a People Dancing Studio 930-1949
11 Clancy's Fancy Real Hot Sauce mfg food products 995-1228
13 Sojourner Farms dog food mfg
14 Burns Richard Sculptor 761-8210
15 Tapert Marie sculptor 996-2795
16 Buesser Andrew C carp 663-8624
17 Sharon Que cabinet mkr
18a Wetel Raymond capr contrs 662-5439
19 Linder Christine sculptor studio 662-4136
20a Luch Michael & Catherine aritst studios 665-9267
20b Ozer Stefanie artist 662-6808
410 Changing Women ritualist feminist tarot 761-9148
Doyle Ann singer-songwrtr studio 663-2221
Moore Kathryn vocalist-voice studio 996-4698
20c Stevenson Nancy G sculptor 971-8540
21a Cooper Ann C artist 761-3216
21b Smith Richard sculptor studio 994-0530
21c Walker Bev artist studio 761-6179
22 Buck Orin computer 994-8781
23 Wayne Miggs artist studio 994-1848
24 Ann Arbor Taxi 741-9000
25 Ann Arbor Serv taxi cabs
26 Kinyann George comp prog ofc 996-5934
28 Schaefer James ofc
29 Engebretsten Douglas office
30-31 Vacant (2 Rms)
32 Eckankar of Ann Arbor (Religious Org) 995-5221
33 Vacant
34 Karr C Y D
35a Luch Michael addl sp
35b Vacant
35c Weichsel Joel artist 747-7934
35d Vacant
36 Oravetz Helen sculptor
38 Yamada Judy musician
38 Hamady Susan artist studio 994-0745
39 Transportation Workers Union 769-0303
40 Marinarow Louis sculptor studio 662-8517
412 Neri Barbara dance studio 931-9106
415 City Dept of Parks & Recreation 994-2768
City Department of Trans 994-1610
City Forestry Div 994-2769
City Traffic Control Division 994-1618
Huron River Watershed Council 769-5123
421 Cyblushi
423 Bailey Joel
424 Ann Arbor Circuits Inc printed circuit bds 665-1444
425 Smith James L ◉ 665-0483

5

3D INTERSECTS
504 Wilson John R ◉ 761-5373
506 Stauch Lewis ◉ 663-8076
No Return
513 Babcock James F 994-5385
514 Grau Kathleen J ◉ 663-4893
515 Stafford John F 663-8276
516 Douglass John L ◉ 761-7529
517★Wier Edwin R ◉ 663-3184
519 Ryan James M ◉ 663-9146
520 William Melvin D ◉ 665-9537
523★Mallon Lawrence 769-7633
No Return

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1006 U Of M (Horace H Rackham Sch Of Graduate Studies) 764-4415
1516 Vacant
3030 Michigan Society Of Fellows 763-1259
3032 Michigan Quarterly Review publs 764-9265
FLETCHER ST INTERSECTS

1

WASHINGTON ST W –FROM 200 S MAIN WEST

ZIP CODE 48103
112 Cracked Crab The restr 769-8591
113 Vogel's Lock & Safe Co Inc 668-6863
114 Ivie Computer comp conslt 665-5115
115 Flame The tavern 662-9680
116 Art Deco Design art gallery 663-3326
117 Fresh Cream Cafe ice cream & lunch counter 665-8959
117½★Sweda L E
119 Sixteen Hands art gallery 761-1110
120 Old German Restaurant 662-0737
120½ Organizational Designs Inc 662-9458
Mitchell Associates archts 662-6070
Jarratt Associates archts 663-6969
121 Earle Building
Suites
Level Earle The restr 994-0211
100 Murray Patricia & Associates ct reporters 995-9545
200 Vacant
300 Burnham & Ritchie lwyrs 761-1870
400 Foster Meade Magill & Rumsey lwyrs 995-3110
400 Ann Arbor Area Foundation 663-0401
122 Del Rio Bar Inc tavern 761-2530
123 Ann Arbor Glassworks glass stained & leaded 769-0242
S ASHLEY INTERSECTS
215 Municipal Parking Garage (Permit Parking Only)
S 1ST ST INTERSECTS

3

ZIP CODE 48103
S 1ST INTERSECTS
A A RY CROSSES
396 Blossom Foods Inc natural foods-caterling 995-5224
Fitzgerald & Associates adv copywriting 671-8440
Maggio Line The adv graphic design illustn
400 Godfrey Joyce Voice Studio 761-7667
Ann Arbor Mime Works
Hamady Susan artist
Bowden Darcy artist
Technical Services audio-video prod 994-8787
Ann Arbor Federation Of Musicians (Local 625) 668-8041
Barrier Free Theater
Green Peace U S A 761-1996
404 Seyfried Printing Co 662-0231
Society For Creative Anachronism side entrance
404½ Otis Elevator Co sls & serv 668-8316
406 American Carbide Tool Co cutting tools 665-9355
408 Performance Network theater productions 663-0681
410 Artists Network Building ofc bldg 663-5333
Rooms
1 Kaplan Arienne graphic art designer
2 Clancy's Fancy Hot Sauce (Stge)
3 Artist's Network Theatres 663-5333
3a Complete Spectrum hlth products-massage therapy
4 Artists Network (Computer Rm)
5 Partners Press Inc printers 662-8681
6 King Helen Costumer 995-9690
8 Vacant
9b Vacant
11 Clancy's Fancy Real Hot Sauce mfg food products 973-3347
14 Burns Richard Sculptor 761-8210
15 Hansen Peter design & woodworking
16 Buesser Andy C carp
17 Wolf Jack carpenter
18a Tapert Marie sculptor
196 Johnson Janfrid cabtmkr
20a No Return
20b Brooks Dana artist
20c Vacant
21a West Margo jwlr
21b Chester Joan pntr
21c Rosenblum Joan Studio artist 761-1769
22 Buck Orin computer
23 Horowitz Fred artist
25 Vacant
26 Patrick Bill visual artist
28 Informed Homebirth socl serv agcy 662-6857
28 Hohman Barbara hands-on healing techniques
28 Chilton Bill theraputic massage
29 Large Ken chiropractor
29 Jones Don massage
29 Hurley Steve A technique
30 Gray Robert Studio artist 747-8210
31 Informed Homebirth (Addl Sp)
32 Eckankar Of Ann Arbor (Religious Org) 994-0766
33 Ball Randel Metal Smith
34 Benson Christine painter
35a Bernardi Claudia artist
35b Curtis Michl sculptor
35c Weichsel Joel artist
35d Kendall Linda writer
36 Engerbetsen Douglas freelance choreographer
37 Cooper Ann artist
38 Komarmy Tracy musician
39 Transportation Employees Union twa of am 769-0303
415 City Dept Of Parks & Recreation 994-2768
City Forestry Div 994-2768
City Traffic Control Division 994-2768
Huron River Watershed Council 769-5123
421 Vacant
423 Nicholls
424 Ann Arbor Circuits Inc printed circuit bds-mfg & sls 665-1444
425 Vacant

5

3D INTERSECTS
504★Hartung Mark 769-6986
506 Stauch Lewis ◎ 663-8076
Hatchard Clayton
513 Babcock J F 994-5385
514 Grau Kathleen J ◎ 663-4893
515★Adamson Robt
516 Douglass John L ◎ 761-7529
519 Ryan James M ◎ 663-9146
520 Vacant
1★Kindshaven Andrea
2★Moran Diana D
600 Quilliam Robt A ◎ 662-6713
601 Turniansky Roberta 995-9245
Noffsinger Norman 996-4045
602 Hutton James D ◎ 663-2943
603★Robilland Helen M ◎
604 No Return
605 Marinaro Louis M ◎ 662-8517
608 Apartments
1 Bodenmiller Robt 996-3831
2 Forsberg-Smith Pat 665-3221
3★Driscoll M C 663-9647
4 Baker Kathleen
609 Bennett Ben ◎ 761-7120
610 Brown Wm E 665-2866
611 Storey Kent G 761-2196

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E WASHINGTON ST—Contd

U Of M (Dept Of Romance Languages & Literature) 763-4352
U Of M (Dept Of Slavic Languages & Literature) 764-5355
U Of M (Dept Of Germanic Languages & Literature) 764-8018
915 U Of M Rackham Building
Rooms
100a U Of M (Bur Of Government Library) 763-3185
106 U Of M (Statistical Research Laboratory) 764-4413
110 U Of M (Graduate Admissions Office) 764-8129
1006 U Of M (Horace Rackham Sch Of Graduate Studies) 764-4400
1516 U Of M (Institue Of Public Policy Studies) 764-3490
3030 Michigan Society Of Fellows 763-1259
3032 Michigan Quarterly Review 764-9265
FLETCHER ST INTERSECTS

1

WASHINGTON ST W —FROM 200 S MAIN WEST

ZIP CODE 48103
112 Cracked Crab The restr 769-8591
113 Vogel's Lock & Safe Co Inc 668-6863
115 Vacant
116 Matsuzak Gerard J lwyr
117 Sweet Chalet The ice cream parlour 665-8959
119 Sixteen Hands art gallery 761-1110
120 Old German Restaurant 662-0737
120½ Preservation Urban Design Inc landscape 994-0313
121 Earle The restr 994-0211
122 Del Rio Bar Inc tavern 761-2530
S ASHLEY INTERSECTS
215 Municipal Parking Garage (Permit Parking Only)
S 1ST ST INTERSECTS

3

ZIP CODE 48103
S 1ST INTERSECTS
A A RY CROSSES
396 University Of Michigan Breast Cancer Detect Center 764-1474
Diagnostic Mammography 764-3105
400 Ann Arbor Ypsilanti Security Service Inc locksmith 761-6677
B S D Smith Investigations Inc detective agcy 761-2461
404 Seyfried Printing Co 662-0231
406 American Carbide Tool Co cutting tools 665-9355
408 Performance Network theater productions 663-0681
410 Straightface Productions (Graphic Design) 662-2112
Young Peoples' Theater 996-3888
Ann Arbor Leather craftsmn
Artist Equity
Noyes Elaine artist
Durley Dryn graphic art
Ann Arbor Chamber Orchestra Soc 996-0066
Fahome John artist
Synergy Creative Healing Center 769-7838
Alan's Woodworks woodworking 665-7589
Gray Robt sculptor
Hohman Conrad inventor
Beaupre Robt cabinet mkr
Burns Richd pntr
Godfrey Joyce dramatist 761-7667
Ann Arbor Transportation Authority
Ann Arbor Transportation Authority
412 Perkins Ruth M ◎ 668-6576
415 City Dept Of Parks & Recreation 994-2768
City Forestry Div 994-2768
City Traffic Control Division 991-1618
Huron River Watershed Council 769-5123
421★Cain-Sedgeman P
Elifritz M 662-1204
423 Bailey J D ◎
424 Ann Arbor Circuits Inc printed circuit bds 665-1444
425 No Return

5

3D INTERSECTS
504★Hollenbeck B J ◎ 769-2002
506 Bross Beatrice M Mrs ◎ 663-1891
Stauch Lewis J 663-8076
513 No Return
514 Grau Clara A Mrs ◎ 663-4893
515 Robertson Wm L 668-0497
516 Douglass John L ◎ 761-7529
519★Ryan Jas M 663-9146
520★Wax Saul ◎ 995-2462
523 Weintraub N 994-1049
Ebbitt Mary 663-9759
600 Quilliam Robt A ◎ 662-6713
601 Turniansky Roberta 995-9245
602 Hutton James D
603★Barberet John R 663-6348
604 Garman Mark ◎
605 Hartman Kimberly 769-2662
606★Foo Chek Peeng 996-4565
608 Apartments
1 Moody J L
2 Forsberg-Smith Pat 665-3221
3★Marsh Wm
4 Tuttle Mark A 761-7904
609 Bennett Matthew C ◎ 761-7120
610 Hierta H M 665-0916
611 Storey Kent 761-2196
MURRAY AV BEGINS
707★Wall Tom 662-6499
711 Haas Richd B ◎ 662-3436
712 Engstrom Mary E 665-0937
★Jones S
716 Hopkins Eug ◎ 996-9406
719 Wagner Richd F ◎ 662-0461
720 Metzger Mark 665-7475
721 Lewis Chas 996-2453
★O'Neill W
MULHOLLAND BEGINS
722 Sullivan James
724 Tracy Frances I ◎ 662-0784
802 Siminow David
805 Singleton Maggie
807 Hobbs Chas 663-9015
808 Cheever Priscilla 761-1838
811★Lemonnier Josee M 996-8582
812★Buesser Tony 996-1906
815 Brandon Judith K ◎ 663-5797
818 Sortor Robt C ◎ 663-2764
819 Harvey Linda L 996-8329
Mc Coy James
820 Meves Eric J ◎ 769-0565
823 Zahn Emma K Mrs ◎ 668-7663
826 Steeb Virginia M 662-0827
829 Sherick Ivan G ◎ 665-8732
830 Boyd Kurt 662-9123
834★Goldenfeld Eug
835 Holzhauer Irene E Mrs ◎ 668-6274
840 Staples Wm C 663-1352
841★Mauy Julius ◎
★El-Kilalidi Tim

15

S 7TH ST INTERSECTS
910 Samuda Virginia 995-2740
Schimmel Geo 662-6902
915 Dutkiewicz Joseph F ◎ 663-5746
919★Trail Darla 663-5944
920★Zinn Frank
921 Richardson Harry
Williams Paul
8TH ST INTERSECTS

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1

WASHINGTON ST W —FROM 200 S MAIN WEST

ZIP CODE 48108
112 Cracked Crab The restr 769-8591
113 Vogel's Lock & Safe Repairs Inc NO8-6863
113½ Vacant
114 Cracked Crab The (Addn Space)
114½ Vacant
115 Flame Bar tavern NO2-9680
115½ Vacant
116 Matuszak & Stillwagon lwyrs 761-5515
116½ American Engineering consulting eng & surveyors 761-0758
117 Mountain High Ice Cream Parlour 994-4944
117½ Taylor Kenneth
Callis Frank
118 Old German Restr (Addn Space)
118½ Vacant
119 Sixteen Hands gift shop 761-1110
120 Old German Restaurant NO2-0737
120½ Preservation Urban Design Inc landscape 994-0313
121 Ragtop used clo 995-5040
Jazz Club The
122 Del Rio Bar Inc restr 761-2530
123 Baobab folk art gallery 662-3681
123½ Vacant
S ASHLEY INTERSECTS
202 Parking Lot
210 Ann Arbor Town Club private dinner club 662-5276
215 Municipal Parking Lot
222 Municipal Metered Parking

3

ZIP CODE 48103
S 1ST INTERSECTS
A A RY CROSSES
396 University Of Michigan Breast Cancer Detect Cntr 764-1474
400 Vacant
404 Seyfried Printing Co 662-0231
406 American Carbide Tool Co cutting tools 663-5456
408 American Case Company mfgr musical instrument cases 995-0430
412 Perkins Ruth M ◎ 668-6576
415 City Board Of Parks & Recreation 761-2400
City Forestry Div 761-2400

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Traffic Signs-Signals & Radios
994-2825
Huron River Watershed Council
665-0514
421 Goldbaum Ross 662-1464
★Sayenga Susanne 663-3536
423 Bailey Don
Teeple Kimberly
424 Ann Arbor Circuits Inc printed circuit bds 665-4101
425 Shaw Rosa 663-4151

5

3D INTERSECTS
504 Mac Donald Virginia ◎ 665-3682
506 Bross Beatrice M Mrs ◎ NO3-1891
513★Taylor Robin L Mrs 665-6564
514 Grau Henry G ◎ 663-4893
515★Schwartz David B ◎ 769-4736
516 Douglass John L & Sons Htg & Air Conditioning Co contr 662-0701
Douglass John L ◎ 761-7529
519 Ryan James M 663-9164
520★Bilezikian Monique A ◎ 668-8481
523★Barnard Robt
600 Quilliam Robt A ◎ 662-6713
601 Noffsinger Donald W 761-4851
602★Simpson Louis J
603 Haynes Lydia C ◎ NO2-1379
604★Block Richd
604½★News Richd
605 Golomb Dan H ◎ 761-2868
608 Anthony Patricia C ◎ 665-3221
609 Bennett Matthew C ◎ 761-7120
610★Hierta H M 665-0916
611 Ingram Thos J ◎ NO2-4159

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202 Parking Lot
210 Ann Arbor Town Club private club NO2-5276
215 Municipal Parking Lot
222 Municipal Metered Parking
215 Municipal Parking Lot 668-9390

3

ZIP CODE 48103
S 1ST INTERSECTS
320 Huron Valley National Bank drive in branch
396 Laser Systems Corp 761-7150
A A R R CROSSES
400 Medical Data Systems Corp mfg comp systems 769-8592
404 Seyfried Printing Co 662-0231
Ann Arbor Door Closer & Lock Service 665-8381
406 Pitney-Bowes Inc ofc equipment 663-5456
412 Perkins Ruth M ◎ 668-6576
415 City Board Of Parks & Recreation 761-2400
City Forestry Div 761-2400
City Parking & Traffic Eng Div (Sign Shop) 761-2400
Huron River Watershed Council 665-0514
418 Schafer Bakeries Inc (Truck Parking)
421 No Return
★Broadbent Thos R 663-3536
423★Walter Lynn
★Crown E H
424 Ann Arbor Circuits Inc printed circuit bds 663-4242
425★Shaw Rosa 662-8543

5

3D INTERSECTS
504 Koppe Bernd ◎ 665-6370
506 Bross Beatrice M Mrs ◎ NO3-1891
Stauch Lewis J ◎ NO3-1891
513 Nowak Pauline C Mrs ◎ NO3-5664
514 Grau Henry G ◎ 663-4893
515 Murrel John L Jr ◎ 665-0917
Switzer Martha C Mrs 663-0114

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118½ VACANT
119 PAUL'S MUSICAL REPAIR 662-1834
120 OLD GERMAN RESTAURANT NO2-0737
121 HI FI STUDIO 668-7942
122 DEL RIO BAR RESTR 663-5485
122½ VACANT
123 EARLE HOTEL NO8-8284
BROOKS BUS LINES AGENCY BUS STA 668-8284
---S ASHLEY INTERSECTS
202 VACANT
210 ANN ARBOR TOWN CLUB PRIVATE CLUB NO2-5276
215 MUNICIPAL PARKING LOT 668-9390
222 MUNICIPAL METERED PARKING LOT

3

---ZIP CODE 48103
---S 1ST INTERSECTS
310 WASHTENAW NEWS CO INC NO8-6911
---A A R R CROSSES
400 AMERICAN BROACH & MACHINE CO MFRS NO2-5621
404 SEYFRIED PRINTING CO 662-0231
410 VACANT
412 PERKINS RUTH M • 668-6576
415 CITY BOARD OF PARKS & RECREATION 761-2400
CITY FORESTRY DIV 761-2400
CITY PARKING & TRAFFIC ENG DIV
HURON RIVER WATERSHED COUNCIL 665-0514
418 ROCKWELL-STANDARD CORP (MECH SPRING DIV) 662-1683
421 PIEHUTKOSKI HAROLD F • 665-8790
GRAY PAUL
423 PATILLO HAROLD 769-0746
425 THOMAS LULA MRS 761-6075

5

---3D INTERSECTS
504 SWEET FRIEDA A MRS • NO2-3478
506 BROSS BEATRICE M MRS • NO3-1891
STAUCH LEWIS J NO3-1891
513 NOWAK PAULINE C MRS • NO3-5664
514 GRAU HENRY G • 663-4893
515 MURRIEL JOHN
516 DOUGLASS JOHN L HEATING & VENTILATING CO CONTR 662-0701
DOUGLASS JOHN L • 761-7529
517 VACANT
519 JACOBUS HAROLD A • 668-7683
520 SHEPERD DAVID A • 761-5869
523 BANCROFT KATH MRS • NO3-2194
600 DONNER VINTON H • NO3-3128
601 CULP KENNETH E 769-3017

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1963

120½ No Return
121 Am Auto Accessories 662-3149
122 Del Rio Bar restr NO2-9575
122½ Vacant
123 Earle Hotel NO8-8284
Brooks Bus Lines Agcy
668-8284
S Ashley intersects
200-10 Nye Mtr Sls Inc used cars
NO8-9757
206 Koken Paul lwyr NO2-0859
210 Ann Arbor Town Club NO2-5276
215 Municipal Parking Structure autos
222 White Jime Inc used cars NO6-3321
W 1st intersects

3

S 1st intersects
301 Sears Roebuck and Co (farm store)
NO2-5501
310 Washtenaw News Co NO8-6911
AARR crosses
400 Am Broach & Mach Co mfrs
NO2-5621
404 Hirth Bros Dairy NO7-7991
410 Householder Margt Mrs 665-5696
412 Perkins Ruth M ◎ 668-6576
415 County Rd Comn NO2-2563
Bd of Park Trustees NO2-2563
421 Piehutkoski Harold F ◎ 662-1722
423 Hahn Ferdi NO3-9247
425 Fitzgerald John J ◎ NO3-5428

5

3d intersects
504 Sweet Frieda Mrs ◎ NO2-3478
506 Bross Beatrice M Mrs ◎ NO3-1891
Stauch Lewis J
513 Nowak Pauline C Mrs ◎ NO3-5664
514 Grau Henry G ◎ NO3-4893
515 No Return
516 Douglass John Heating Co htg &
ventilating contrs 662-0701
Douglass John L ◎ NO2-0701
517 Dobos Wm G ◎ NO3-6966
519 Miller Raymond H NO3-1485
520 Witting Clair C ◎ NO3-5509
523 Bancroft Kath Mrs ◎ NO3-2194
Baur Edwin T NO2-2621

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1958

120 Old German Restr ΔNO2-0737
120½ Vacant
121 Universal CIT Credit Corp
ΔNO2-6555
122 Del Rio Cafe restr ΔNO2-9575
George Thos
122½ LaPrell Geo A
Sarbo Richd
123 Earle Hotel ΔNO8-8284

S Ashley intersects

200-10 Nye Mtr Sls Inc used cars
ΔNO8-9757
206 Koken Paul lwyr ΔNO2-0859
Hume's Paint & Wallpaper
ΔNO8-7373
Teamsters Union Local No 247
ΔNO8-6640
Teamsters Union Local No 299
ΔNO8-7753
210 Ann Arbor Town Club tavern
ΔNO2-5276
215 Municipal Parking Structure
autos
222 White Jim Inc used car lot
ΔNO2-5000

W 1st intersects

3

S 1st intersects

301 Sears Roebuck & Co (farm store)
ΔNO2-5501
310 Washtenaw News Co ΔNO8-6911

AARR crosses

400 Am Broach & Mach Co (rear ent)
404 Hirth Bros Dairy ΔNO8-7991
410 Novak Frank
412 Perkins Ruth M ◎ ΔNO8-6576
415 Washtenaw County Road Comn
ΔNO2-2563
Board of Park Trustees
421 Comstock Chas
Brief Douglas J ΔNO3-3237
423 Rivers Alva W ΔNO5-5404
425 Fitzgerald John J ◎ ΔNO3-5428

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1958

WASHINGTON W—Contd

3d intersects

504 Sweet Carl A ◎ △NO2-3478
506 Bross Beatrice M Mrs ◎ △NO3-1891
Stauch Lewis J
513 Nowak Gustae H ◎ △NO3-5664
514 Grau Henry G ◎ △NO3-4893
515 Martin Manford E △NO5-6729 ,pntr
Klobuchar Thomas △NO5-6543
516 Douglass John L jr ◎ △NO2-0701
517 Dobos Wm ◎ △NO3-6966
519 Nothdurft Geo J ◎ △NO2-5808
520 Witting Clair C ◎ △NO3-5509
523 Bancroft Kath Mrs ◎ △NO3-2194
Baur Edwin △NO2-2621
600 Donner Vinton H ◎ △NO3-3128
601 Noffsinger Donald W ◎ △NO3-3790
602 Allmedinger Walter C ◎ △NO2-1435
603 Murphy Mabel B Mrs ◎ △NO2-2166
Haynes Lydia Mrs △NO2-1379
604 Schuster Pearl Mrs △NO3-1033
Hall Andrew C △NO5-7165
605 Saxton Lea ◎ △NO2-7784
608 Leary D Viola ◎ △NO3-3142
Beagle Marlene △NO2-5486
609 Frost Albert L ◎ △NO3-4001

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1954

118 Δ Daisy Mkt The gro
118½ Vacant
119 Vacant
120 Δ Old German Restr
120½ Δ VanGieson Mary Mrs
121 Vacant
122 Δ LaCasa Restr
122½ LaPrull Geo
123 Δ **Earl Hotel**

S Ashley intersects

200-10 Nye Mtr Sls Inc auto
206 Δ Koken Paul Lwyr Teamsters Union
Δ Dand's Paint & Wallpaper
210 Selective Serv Sys Local Draft Board No 85
215 Δ Municipal Parking Structure autos 3

S 1st intersects

301 Sears Roebuck & Co (farm store)

AARR crosses

400 Δ Am Broach & Mach Co (br) (plant 2)
404 Δ Hirth Bros Dairy
410 Δ Weber Jack
412 Δ Perkins Fannie C Mrs
415 Δ Washtenaw County Road Comn
421 Δ Frisbie Gerald R
423 Δ Wolf Fred ◎
425 Δ Fitzgerald John J ◎ 5

3d intersects

504 Δ Sweet Carl A ◎
506 Δ Bross Beatrice Mrs ◎
513 Δ Nowak Gustave H ◎

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1949

502-04△Ann Arbor Motor Sales & Service
510△Mercury Delivery
△Hertz Driv-Ur-Self System Inc
513△Burgett Elmer J ⓞ
514△Cushing Motor Sales Inc autos
517 **Apartments**
bsmt Vacant
1 Leisenring Kenneth B
2 Keenan Pauline Mrs
3△Robinson Ellis L
4△Gillespie Lucille C Mrs
5△Howard Edw E
6△Holton Marion
Street continued
600△Belser Emma L Mrs ⓞ
602△Ehnis Mary ⓞ
604△Cahill John F ⓞ
606△Sossi Donna Mrs
S State intersects
712 **Parchen Apartments**
Apartments:
1△Parchen Carolyn E Mrs ⓞ
2△Foor Otis
3 Wilt Marie
4△Tittiger Katheryn
5 Hansen Ethel B
6-7△Trombley Kath
S Thayer intersects
810△Kyungwhan Lee
812△Donahue Rose ⓞ
S Ingalls begins
820△Flintoff Wm M
ns Rackham Building
ns△Rackham Horace H School of Graduate Studies
Rackham Horace H and Mary A Fund
Fletcher intersects
1103△Daum Elmer J ⓞ
Park ter ends
1110△U of M Laundry
1111△Dosey Erwin W
1202△U of M Carpenter Shop
1203△U of M Heating Plant
1220△University Hosp Nurses' Home Annex
S Forest av intersects

1

WASHINGTON W — From 200 S Main west to S Revena blvd
112△Herz Oswald A paints and wall paper
113△Vogel Gus J sporting gds and mach shop
114△Frey's Cafe
114½△Schlanderer Eug F
Smith Elmer
115△Flame Bar The beer garden
116△Hansen's Conditorei bakers
116½△Webber J Edw
117△Oliver Seward barber
118△Daley Market The gros and meats
118½ Vacant
119 Staebler & Sons Inc used cars (side entrance)
120△Old German Restaurant
120½ McCollum Nealy
VanGieson Mary Mrs
Cole Freda Mrs
122 Vacant
122½ Kiros Geo
123△Griswold Hotel
S Ashley intersects
206△Savery R L Implement Co agri implts
206½△Elfring Wm L
208-10△Nye Motor Sales auto dlrs
208½ United Auto Workers (CIO) Local No 28
215△Municipal Parking Structure autos
220 Vacant

3

S 1st intersects
301 Sears Roebuck & Co (farm store)
310 Vacant
315 Vacant
AARR crosses
400△American Broach & Machine Co (br) (plant 2)
404△Hirth Bros Dairy
410△Dwyer Wayne B
△Howard Marland G ⓞ
412△Perkins Fannie C Mrs ⓞ
415△Washtenaw County Road Commission
421△Heorodt Edw P jr
△Goldman Louis
423△Maurer Rose C Mrs
Wolf Fred ⓞ
425△Fitzgerald John J ⓞ

5

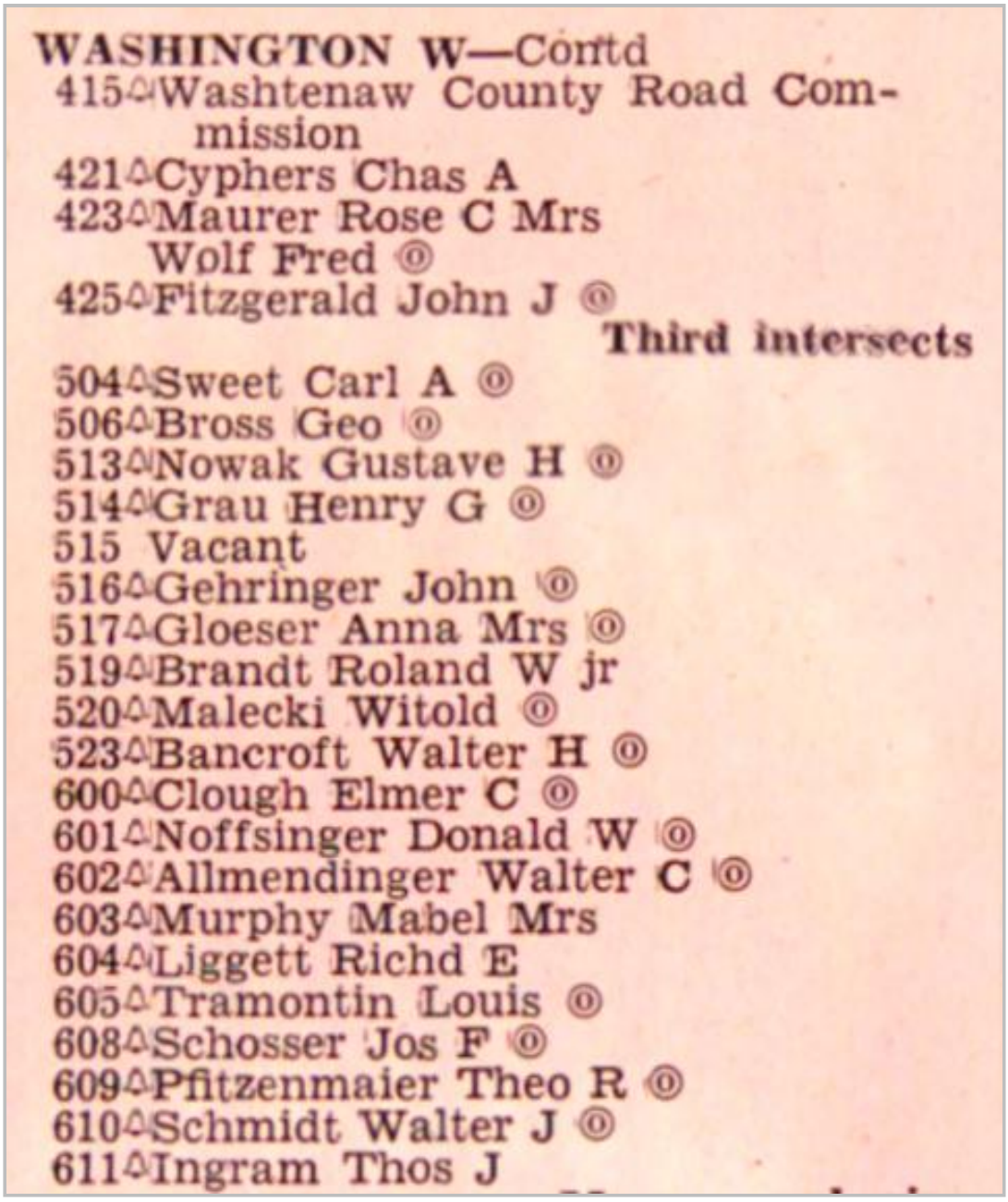
3d intersects
504△Sweet Carl A ⓞ
△Sweet Heating furnaces
506△Bross Geo ⓞ
513△Nowak Gustave H ⓞ
514△Grau Henry G ⓞ
515 Lattimer Jas H
516△Gehringer John ⓞ
517△Gloeser Anna Mrs ⓞ
519△Brandt Roland W
520△Witting Clair C
523△Bancroft Cath Mrs ⓞ
600△Clough Elmer C ⓞ
601△Noffsinger Donald W ⓞ
602△Allmendinger Walter C ⓞ
603△Murphy Mabel Mrs
604△Douglass John M
Schuster Curtis F
605△Saxton M Lea Mrs ⓞ
608△Schosser Jos F ⓞ
609△Pfitzenmaier Theo R ⓞ
610△Schmidt Walter J ⓞ
611△Ingram Thos J ⓞ
Murray av begins
707△Witcher C Preston ⓞ
711△Feldkamp Edwin L ⓞ
712△Eder Julius S
Gaglis Wm
716 Demaline Burcell R
719△Murray Wm H ⓞ
720△Guterkunst Oliver J ⓞ
721△Ludeman Richd F
722△Finkheiner Harold J ⓞ
724△Tracy Helen Mrs ⓞ
802△Mayer Emma L Mrs ⓞ
△Gauss Harold E
803-09 Waterworks Station No 2
808△Sayfried Wm F ⓞ
△Sherbert Jos R
811△Voelker Geo J ⓞ
812△Stolt Geo J ⓞ
△Boettger Glenn F
815△Knop Eliz S Mrs ⓞ
818△Stoll E J ⓞ
819 Lang Eliz K Mrs ⓞ
Frost Albert
820 Erdman Wm C ⓞ
823△Zahn Benj J ⓞ
826△Steeb Herman J ⓞ
829△Hinz Ernest F ⓞ
830△Munday Jas E ⓞ
834△Ehnis Herman G ⓞ
835△Holzhauer Geo J ⓞ
840△Palmer Harry C
841△Remnant Ora Mrs ⓞ

15

S 7th intersects
910△Owens Roy W ⓞ
915△Hague Ross S ⓞ
919△Britton Elmer H
920△London Wm A ⓞ
921△Schlecht Lawrence A ⓞ
8th intersects
1001△Richards Clayton B
1005△Edman Jas L ⓞ
1008△Butt Ernest C W ⓞ
1009△Wakefield Floyd G ⓞ
1012△Miller Freeman D
1017 Rohrbaugh Jas E
ss△Slauson Herbert M Junior High School
9th ends
1102△Melton Edw J ⓞ
1104△Applegate Jas H ⓞ
1105△Parkes John W ⓞ
1106△Seeger Robt jr ⓞ
1109△Gerstler Ottmar A ⓞ bldg contr
1113 Braunmiller Anna ⓞ

Target Street	Cross Street	Source
✓	-	Polk's City Directory

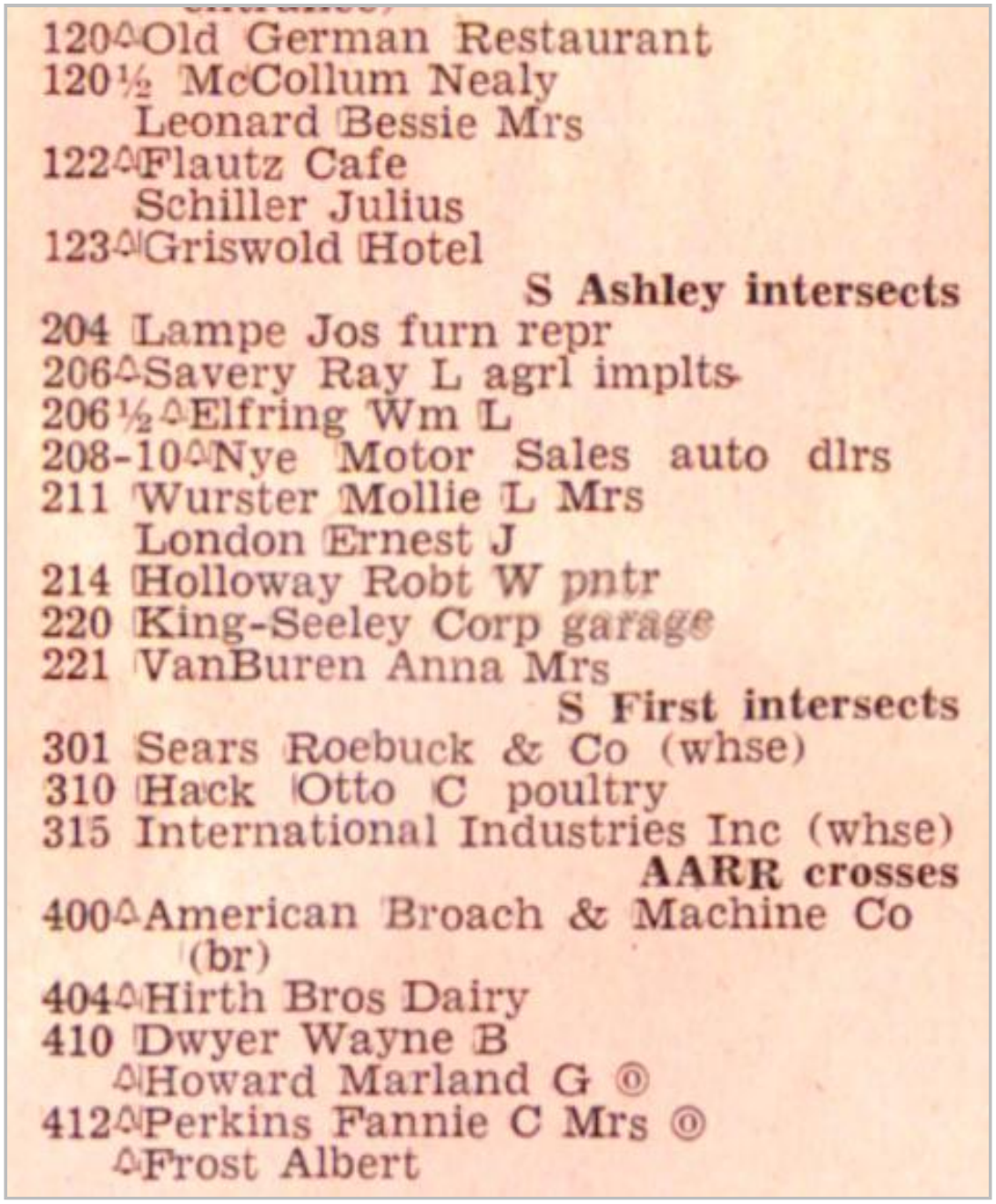
W. Washington 1945



WASHINGTON W—Contd
415 Washtenaw County Road Commission
421 Cyphers Chas A
423 Maurer Rose C Mrs
Wolf Fred ◎
425 Fitzgerald John J ◎
Third intersects
504 Sweet Carl A ◎
506 Bross Geo ◎
513 Nowak Gustave H ◎
514 Grau Henry G ◎
515 Vacant
516 Gehringer John ◎
517 Gloeser Anna Mrs ◎
519 Brandt Roland W jr
520 Malecki Witold ◎
523 Bancroft Walter H ◎
600 Clough Elmer C ◎
601 Noffsinger Donald W ◎
602 Allmendinger Walter C ◎
603 Murphy Mabel Mrs
604 Liggett Richd E
605 Tramontin Louis ◎
608 Schosser Jos F ◎
609 Pfitzenmaier Theo R ◎
610 Schmidt Walter J ◎
611 Ingram Thos J

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1945



120 Old German Restaurant
120½ McCollum Nealy
Leonard Bessie Mrs
122 Flautz Cafe
Schiller Julius
123 Griswold Hotel

S Ashley intersects

204 Lampe Jos furn repr
206 Savery Ray L agrl implts
206½ Elfring Wm L
208-10 Nye Motor Sales auto dlrs
211 Wurster Mollie L Mrs
London Ernest J
214 Holloway Robt W pntr
220 King-Seeley Corp garage
221 VanBuren Anna Mrs

S First intersects

301 Sears Roebuck & Co (whse)
310 Hack Otto C poultry
315 International Industries Inc (whse)

AARR crosses

400 American Broach & Machine Co (br)
404 Hirth Bros Dairy
410 Dwyer Wayne B
Howard Marland G ⓪
412 Perkins Fannie C Mrs ⓪
Frost Albert

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1940

122△Flautz Cafe The
122½ Webber John K
△Flautz Reinhold G

S Ashley intersects

sw cor Jung Paul F filling sta
204△United Tire Service
206△Savery Ray L agrl implts
206½ Ann Arbor Camp No 2796 (M W of A)
208△Electronic Products Mfg Corp photog equip
210 Huron Motor Sales Inc (show rm)
211 Wurster Mollie L Mrs
214 Holloway Robt W pntr
220 Vacant
221 VanBuren Anna Mrs
Shuey Clarence F

First intersects

301△Swisher Grocer Co
310△Poultry Market

AARR overpass

400△Cushing Motor Sales used cars
404△Hirth Bros Dairy
410 Dwyer Wayne B
△Howard Marland G ◎
412△Perkins Fannie C Mrs ◎
415△Washtenaw County Road Commission
421 Millage C Henry ◎
423△Maurer Chas F
Wolf Fred ◎
425△Jaeger Fredk H

Third intersects

504 O'Reilly Jos B
506△Bross Geo
513△Nowak Gustave H ◎
514△Grau Henry G ◎
Clemens Jos
515△Wiedman Fredk J ◎
516△Gehringer John ◎
517△Gloeser Anna Mrs ◎
519 Nothdurft J Geo
520△Braun Philip R ◎
523△Bancroft Walter H ◎
600△Clough Elmer C ◎
601△Potvin Geo E
602△Allmendinger Walter C ◎
603△Delhey Frank M
604△Cave Chas H
605△Nagel Martha M Mrs ◎

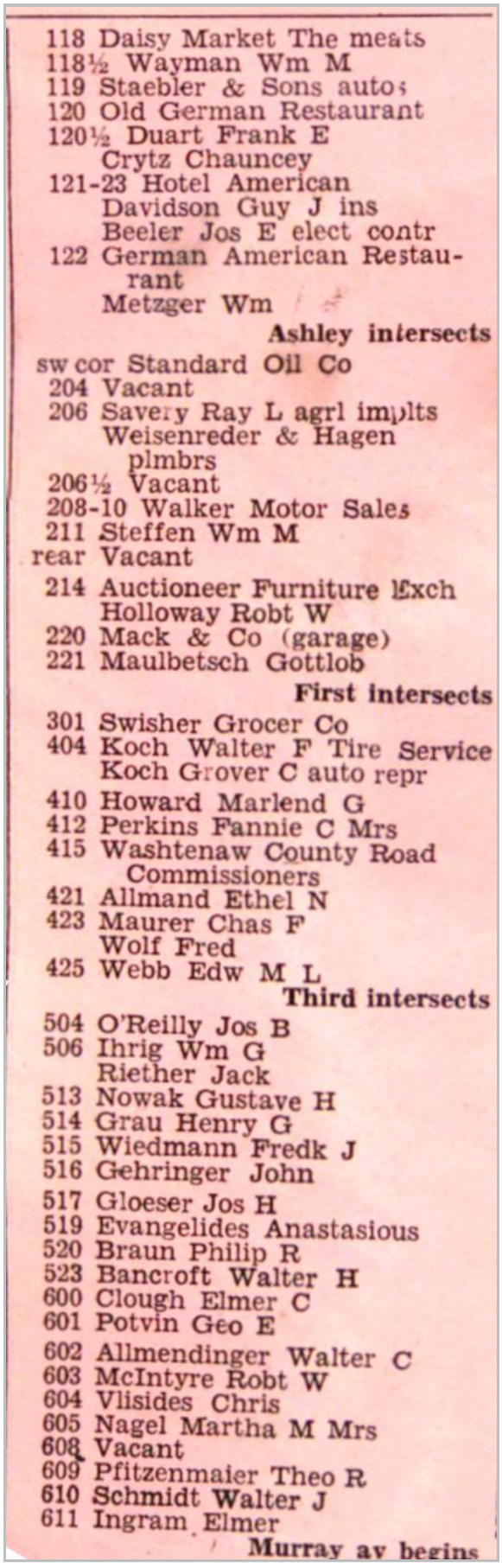
Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1936

120 Old German Restaurant
120½ Crytz Chauncey W
Walz Nellie C Mrs
121-23 Griswold Hotel
Smith Fred H
122 Vacant Mrs F. FLAUTZ
Ashley intersects
sw cor Standard Oil Co
204 United Tire Service
206 Savery Ray L agrl implts
Weisenreder & Hagen plmbrs
206½ M W of A
208-10 Huron Motor Sales
211 Steffen Wm M
214 Auctioneer Furniture Exch
Holloway Robt W
220 Mack & Co (garage)
221 Maulbetsch Gottlob
First intersects
301 Swisher Grocer Co
310 Poultry Market
400 Johnson-Cushing Inc used cars
404 Service Freight Lines Inc
W P A Local Area of Monroe and Washtenaw Counties (whse)
410 Dwyer Wayne B
Howard Marlend G
412 Perkins Fannie C Mrs
McKnight Geraldine nurse
415 W P A Local Area of Monroe and Washtenaw Counties
Washtenaw County Road Commission
421 Dosey Erwin W
Schaffer F Lilburn
423 Maurer Chas F
Wolf Fred ®
425 Jaeger Fredk H
Third intersects
504 O'Reilly Jos B
506 Bross Geo

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1932



118 Daisy Market The meats
118½ Wayman Wm M
119 Staebler & Sons autos
120 Old German Restaurant
120½ Duart Frank E
Crytz Chauncey
121-23 Hotel American
Davidson Guy J ins
Beeler Jos E elect contr
122 German American Restaurant
Metzger Wm

Ashley intersects

sw cor Standard Oil Co
204 Vacant
206 Savery Ray L agrl implts
Weisenreder & Hagen plmbrs
206½ Vacant
208-10 Walker Motor Sales
211 Steffen Wm M
rear Vacant
214 Auctioneer Furniture Exch
Holloway Robt W
220 Mack & Co (garage)
221 Maulbetsch Gottlob

First intersects

301 Swisher Grocer Co
404 Koch Walter F Tire Service
Koch Grover C auto repr
410 Howard Marlend G
412 Perkins Fannie C Mrs
415 Washtenaw County Road Commissioners
421 Allmand Ethel N
423 Maurer Chas F
Wolf Fred
425 Webb Edw M L

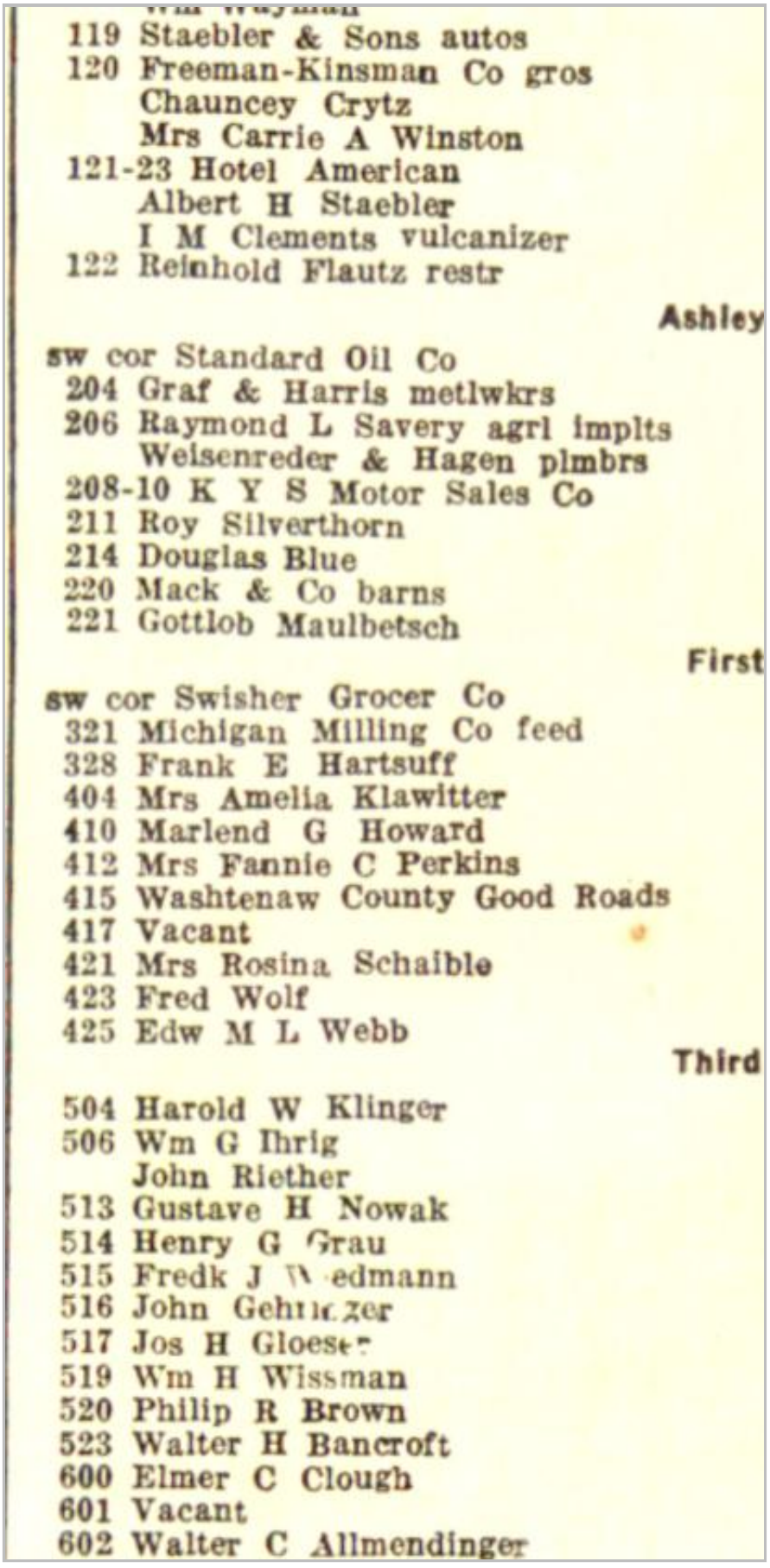
Third intersects

504 O'Reilly Jos B
506 Ihrig Wm G
Riether Jack
513 Nowak Gustave H
514 Grau Henry G
515 Wiedmann Fredk J
516 Gehringer John
517 Gloeser Jos H
519 Evangelides Anastasious
520 Braun Philip R
523 Bancroft Walter H
600 Clough Elmer C
601 Potvin Geo E
602 Allmendinger Walter C
603 McIntyre Robt W
604 Vlisides Chris
605 Nagel Martha M Mrs
608 Vacant
609 Pfitzenmaier Theo R
610 Schmidt Walter J
611 Ingram Elmer

Murray av begins

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1927



119 Staebler & Sons autos
120 Freeman-Kinsman Co gros
Chauncey Crytz
Mrs Carrie A Winston
121-23 Hotel American
Albert H Staebler
I M Clements vulcanizer
122 Reinhold Flautz restr

Ashley

sw cor Standard Oil Co
204 Graf & Harris metlwkrs
206 Raymond L Savery agri implts
Weisenreder & Hagen plmbrs
208-10 K Y S Motor Sales Co
211 Roy Silverthorn
214 Douglas Blue
220 Mack & Co barns
221 Gottlob Maulbetsch

First

sw cor Swisher Grocer Co
321 Michigan Milling Co feed
328 Frank E Hartsuff
404 Mrs Amelia Klawitter
410 Marlend G Howard
412 Mrs Fannie C Perkins
415 Washtenaw County Good Roads
417 Vacant
421 Mrs Rosina Schaible
423 Fred Wolf
425 Edw M L Webb

Third

504 Harold W Klinger
506 Wm G Ihrig
John Riether
513 Gustave H Nowak
514 Henry G Grau
515 Fredk J Woedmann
516 John Gehringer
517 Jos H Gloeser
519 Wm H Wissman
520 Philip R Brown
523 Walter H Bancroft
600 Elmer C Clough
601 Vacant
602 Walter C Allmendinger

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1920

122 Oswald Dietz & Son, soft drinks
Richard Bucholz

Ashley

203 Vacant
204 Wm R Schneider, plumber
206 Swisher Grocer Co
210 Swisher Grocer Co, warehouse
211 Edward J Hill
214 Mrs Pauline Wurster
220 Mack & Co, barns
221 Gottlob Maulbetsch

First

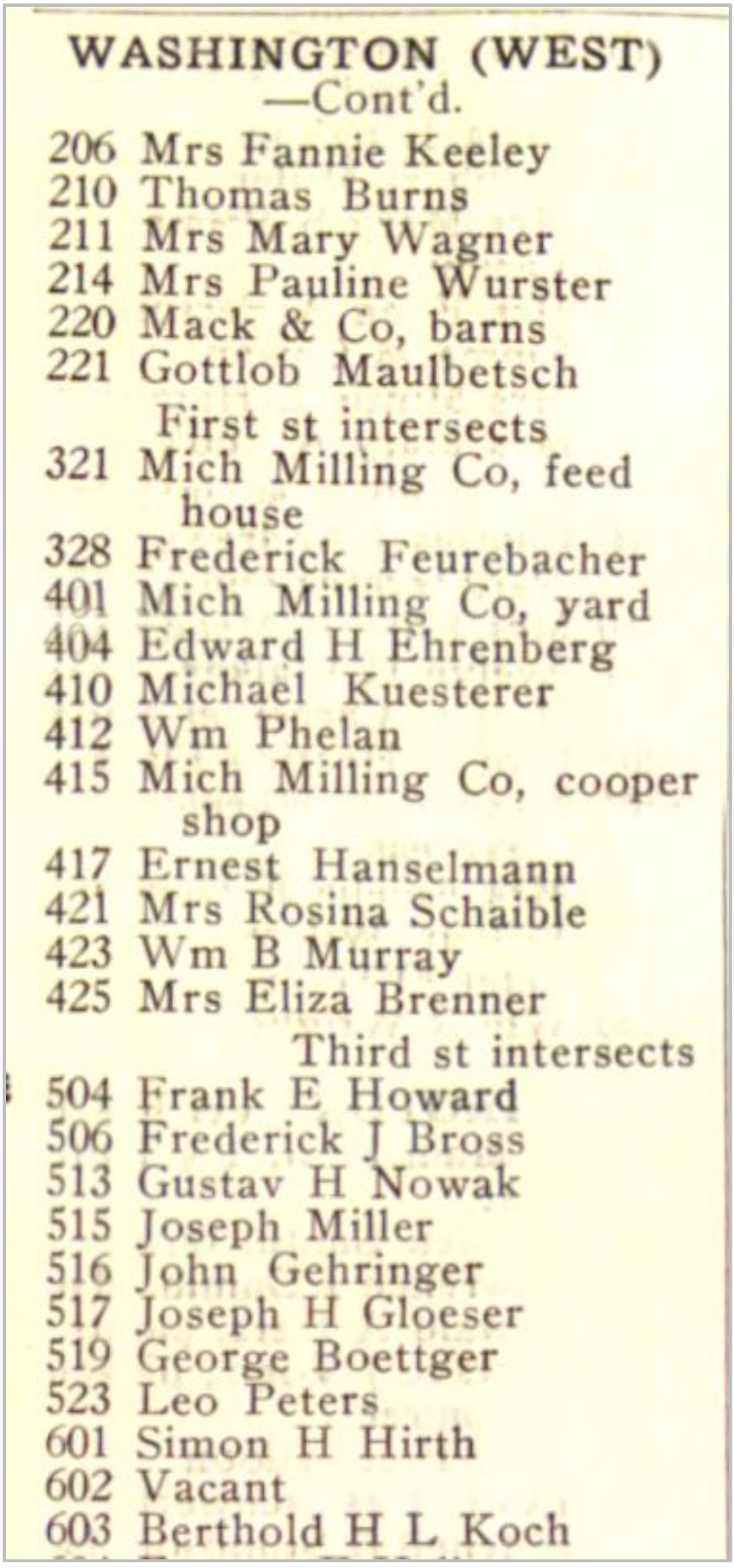
321 Mich Milling Co, feed
328 Frederick Feuerbacher
401 Mich Milling Co, yard
404 Mrs Emilia Klawiter
410 Marlend G Howard
412 Mrs Fannie C Perkins
415 Mich Milling Co, cooper shop
417 Commercial Trucking Co
Hugh H Dowler
421 Mrs Rosina Schaible
423 Wm B Murray
425 Ernest H Latimer

Third

504 Frank E Howard
Hugh F Donehoo
506 Frederick J Bross
513 Gustave H Nowak
515 Frederick Wiedmann
516 John Gehringer
517 Joseph H Gloeser
519 John Leneberg
Carl W Leneberg
523 Vacant
600 Oscar F Laubengayer
601 H Simon Hirth

Target Street	Cross Street	Source
✓	-	Polk's City Directory

W. Washington 1915



WASHINGTON (WEST)
—Cont'd.

206 Mrs Fannie Keeley
210 Thomas Burns
211 Mrs Mary Wagner
214 Mrs Pauline Wurster
220 Mack & Co, barns
221 Gottlob Maulbetsch
First st intersects
321 Mich Milling Co, feed house
328 Frederick Feurebacher
401 Mich Milling Co, yard
404 Edward H Ehrenberg
410 Michael Kuesterer
412 Wm Phelan
415 Mich Milling Co, cooper shop
417 Ernest Hanselmann
421 Mrs Rosina Schaible
423 Wm B Murray
425 Mrs Eliza Brenner
Third st intersects
504 Frank E Howard
506 Frederick J Bross
513 Gustav H Nowak
515 Joseph Miller
516 John Gehringer
517 Joseph H Gloeser
519 George Boettger
523 Leo Peters
601 Simon H Hirth
602 Vacant
603 Berthold H L Koch

APPENDIX G

HISTORICAL REPORTS AND SUPPORTING DOCUMENTS

(ON ELECTRONIC COPY ONLY)

Martin Overtiser
Planning

MEMORANDUM

Chuck, Have another copy.
Mad

DATE: April 12, 1990

TO: Del Borgsdorf, City Administrator
Mayor Jernigan
City Council Members

FROM: Ron Olson, Superintendent of Parks and Recreation

SUBJECT: Environmental Test results on 415 W. Washington Street site, North Main Garage and Hawkins Property

Attached is the summary section of the above report.

The Garage Committee will review the test results on Wednesday, April 25, 1990 at 7:00PM 2nd Floor Conference Room/Fire Station. A representative from ENCOTEC will be present to discuss the testing and answer questions.

RO:mc

CITY OF ANN ARBOR
RECEIVED
APR 20 1990
PLANNING DEPARTMENT

CITY OF ANN ARBOR · · · DEPARTMENT OF PARKS AND RECREATION
100 N. FIFTH AVE. P.O. BOX 8647, ANN ARBOR, MICHIGAN 48107 TELEPHONE (313) 994-2780

ENVIRONMENTAL
CONTROL
TECHNOLOGY
CORPORATION

3985 RESEARCH PARK DRIVE
ANN ARBOR, MICHIGAN 48108
313/761-1389

5 March, 1990

Mr. Ron Olson
City of Ann Arbor
Parks and Recreation Dept.
100 North Fifth Ave.
P. O. Box 8647
Ann Arbor, MI 48107

RE: Environmental Property Assessments for Hawkins, 415 W. Washington Street, and Municipal Garage Properties

Dear Ron:

Enclosed are two copies of the Environmental Property Assessment that was done under RFP No. 250. This assessment should provide sufficient data and evaluation to characterize the properties mentioned above. I must personally apologize for the delay in forwarding this report to you as I had hoped to have time to review more pertinent sections with you. This report shows that there may be some areas in need remediation on each of the properties. These areas appear to be localized spills or "hot spots." However, there should be additional sampling and analytical work performed prior to conducting any remedial activities to better delineate the size of these areas and limit the extent of excavation necessary.

If there are any questions or comments, please feel free to contact Randy Ponitz, ENCOTEC Geologist, or myself at your convenience.

Thank you for allowing ENCOTEC the opportunity to serve your environmental needs.

Sincerely,

Douglas L. Humbert
Senior Environmental Scientist

Enclosure

dlh

Project No. 79110

City of Ann Arbor
Environmental Property Assessment
26 February, 1990

I INTRODUCTION

Environmental Control Technology Corporation (ENCOTEC), Ann Arbor, Michigan, has been contracted by the City of Ann Arbor Parks and Recreation Department (COAA) to perform an environmental site investigation and assessment which will evaluate and identify any potential contamination from hazardous wastes in soils and waters at certain City of Ann Arbor properties. This assessment was performed on the three properties identified in COAA 6 July, 1989, Request for Proposal No. 250 as amended by 4 August, 1989, Addendum No. 1.

II SCOPE OF PROJECT

The specific goal of this project was to identify site contamination for the following properties identified in COAA Proposal:

A HAWKINS PROPERTY

This property is located off of North Main St. at Lakeshore Drive and the Huron River in Ann Arbor. The property incorporates two parcels that comprise approximately 8 acres of land abutting the Huron River on the East side. The West side is bordered by an active railroad. Current uses of the site include an auto body repair shop, a towing service, a rowing club and an artist's studio. Previously, the western-central portion of this property was leased by Michigan Automotive Research Corp (MARC). This portion of property contained two buildings which MARC used for engine testing. There were 5 underground storage tanks, 4 - 10,000 and 1 - 1,000 gallon, that held gasoline for engine testing. These tanks have been removed since this contract's approval and implementation.

Being a low-lying area, this property has been filled over the years to facilitate continued use during times of flood. The origin of fill material(s) is not known and can be better determined by conducting numerous soil borings at the property. This task will be performed as a portion of this evaluation. It is not suspected however that the fill material(s) would be located below the water table, (probably at or near the elevation of this property's soil surfaces). Should there be any contamination present, the water table should not provide any type of barrier that could prevent migration. Therefore, samples will be taken from the ground water after it is encountered at each boring location.

Additional samples will be taken from the soils adjacent to the railroad to delineate and potentially define contamination from polychlorinated biphenyl compounds (PCB's). These are suspect contaminants from railroad usage and may have been transported onto the site through particulate dispersion. A grid pattern will be developed from existing maps and sampled as specified in ENCOTEC's proposal with one sample being removed from the center of each grid.

B NORTH MAIN STREET MUNICIPAL GARAGE

The Municipal Garage is located at 717 through 725 North Main Street. This property is presently being utilized for vehicle and equipment maintenance, road salt storage, fuel storage, and miscellaneous equipment storage and comprises 5.13 acres. Numerous buildings exist on site including a large COAA maintenance complex and several miscellaneous storage buildings. The property is bordered by North Main St. to the East, an active railroad to the West, residential housing to the south and Summit St. to the north. A single underground storage tank was identified in the property survey. This

tank was reported to contain waste oils. Since the implementation of subsurface investigation and sampling, the tank has been removed. Fuel storage tanks are located above ground with only the dispenser piping traversing the site below soil surfaces. On the east side of this property, adjacent to the railroad, is a spur that was reported by COAA employees to have been a coal unloading station. The northern most section of the property is presently used for parking. The Allen Creek Drain traverses the North Main Street property from the southwest to the northeast.

Surface and sub-surface investigations will be necessary to evaluate potential contamination from fuel spillage, unknown fill materials potentially placed during early years of operation, waste oil from leaking underground storage tanks and leaking dispenser piping for the existing refueling station. Ground water is expected to be encountered for each subsurface investigation borehole. Ground water may be sampled and analyzed to determine if contamination has occurred from any of the potentially identified or other unidentified sources.

C WEST WASHINGTON OFFICE AND MAINTENANCE FACILITY

This property is located at 415 West Washington Street. The property comprises 3.40 acres of land and contains a large building complex with some smaller outlying buildings. This parcel is bordered by West Washington St. to the North, West Liberty St. to the south, an active railroad to the east and residential housing to the west. Property usage includes COAA vehicle maintenance, city sign production and maintenance shop, various departmental offices, and miscellaneous equipment storage. Two existing underground storage tanks were identified on-site. These are both of relatively recent

construction. Two above ground storage tanks were also identified. The first is located on the east property boundary adjacent to West Washington Street and the railroad; the second is located at the east end of north building complex. Both tanks are believed to be empty. The tank attached to the building complex is suspected to once have held fuel oil for building heat systems. No information could be obtained regarding the contents of the other tank.

Interviews with COAA employees revealed that this property once belonged to Washtenaw County. Details of activities conducted by the County were somewhat restricted to information obtained during these interviews. COAA employees stated that this property was utilized as a highway maintenance and engineering facility, similar to present usage.

This site may have been contaminated from refueling activities, sign production and finishing, vehicle and equipment maintenance, pesticide and herbicides used by COAA and Washtenaw County, and leaking underground and above ground storage tanks. A surface and sub-surface soil investigation will be performed in selected areas to determine if contamination has occurred by COAA or Washtenaw County. Additionally, groundwater samples may be taken in select areas suspected of contamination.

III PROCEDURES UTILIZED TO CONDUCT SITE ASSESSMENTS

Based on the information presented within COAA RFP 250, ENCOTEC submitted a general proposal to investigate the above mentioned properties. The intent of this investigation was to identify areas with an associated risk from the improper management of hazardous and toxic materials during past and present property usage. The procedures ENCOTEC utilized for investigative purposes were typical to the

environmental industry for the evaluation of property involved in this type of assessment. An assessment is usually multi-phasic. Each action ends with a decision making step that determines whether to continue further into the investigative process. Although this process incurs more expense (e.g. re-mobilization of drilling crew) should additional sub-surface investigations be necessary subsequent to an initial event, the process is considerably less costly when no contamination is detected.

A SITE VISITATION AND SURVEY

The site visitation is an essential portion of a property assessment to locate areas of potential contamination and better define the assessment process by identifying past and present areas of heavy industrial usage. Within the property survey process the visiting crew typically covers all areas of the property to determine the type of activities for which the property has been used. At a minimum these include: current operating conditions which the owner or tenant is undertaking or has undertaken that could result in the contamination of soils and groundwaters, identifying areas that have been filled and/or areas on which stressed vegetation is obvious, and surveying businesses adjacent to the property were contamination could have migrated on-site. The survey crew will make every attempt to interview employees in order that knowledge of the site history be obtained.

ENCOTEC typically performs site visitations with both the project manager and a geologist. These individuals carefully survey the property to be investigated. Notes are taken with regard to the topography of the site, suspected direction of groundwater flow, obvious indications of soil contamination such as soil staining or stressed vegetation, abandoned drums or other empty hazardous

material containers, locations of underground storage tanks appurtenances and dispensers, areas of equipment storage, equipment maintenance areas, on-site locations of electrical transformers, abandoned batteries and the adjacent properties' usage. During this site visitation, utilities are duly noted as they may affect the sub-surface soil investigations. If personnel are available, interviews will be conducted to better determine activities that have occurred within and adjacent to property boundaries.

Usually, the information obtained within an initial visitation is sufficient to select boring locations. These boring locations are determined while on-site and clearly marked so that the drilling crew and ENCOTEC geologist can relocate the boring points while the investigation is taking place. Should additional information be required prior to selecting boring locations, (e.g. drainage tile locations, abandoned underground storage tanks, property boundaries, etc.), this information will be obtained and the site revisited to select the boring locations.

Once all the necessary information has been obtained from the site visitation and boring locations have been selected, some additional activities must take place prior to conducting the soil borings. First and foremost, a utility locater service must be contacted and a request made for underground utilities locations to be clearly identified at the property undergoing the investigation prior to conducting any soil boring activities. Contractual agreements are made between the drilling contractor and ENCOTEC to conduct soil borings for the days necessary to investigate the property. These contracts typically specify the property locations and dates on which drilling is to be conducted. The drilling contractor is also given specific instructions with

regards to sampling depths and procedures, equipment decontamination, health and safety, and any associated hazards which may be at the site while the investigation is taking place. Finally, ENCOTEC laboratory personnel are contacted through inter-company correspondence and made aware of the date(s) for the incoming samples to expedite the analytical process and data production phase for this type of investigation.

B SUBSURFACE INVESTIGATION AND SAMPLE COLLECTION

1 Soil Sampling

The next phase of a site assessment will normally be subsurface investigation and sample collection. For this investigation, series of bore holes were drilled on each property and subsurface core samples were removed from each bore hole for lithologic logging, VOC field screening and chemical analysis. Soil borings were performed using CME 55 and/or CME 75 truck mounted auger drilling rigs with 4 inch diameter hollow stem augers in 5 foot sections. Core samples were taken from the bore holes in 24 inch sections using split spoon samplers in accordance with ASTM D-1586. Samples were collected at the surface and thereafter at 5 foot depth intervals to a total depth of 20' or until ground water was encountered, whichever occurred first.

For the surface samples, split spoons were driven directly into the surface using a 140 lb. drop hammer. Subsurface sampling requires that the bore hole be advanced to the predetermined depth using hollow stem auger. The drill bit is then removed from the lead auger and withdrawn from the bore hole by hoisting 10 foot sections of drilling rod through the hollow stem of the auger string. The bit is removed from the lead rod and replaced by a split spoon sampler that is then

lowered through the hollow stem of the auger string by connecting successive 10 foot sections of the drilling rod and lowering these to the bottom of the bore hole. When the split spoon contacts the bottom, it is driven into the soil below with a series of repetitive blows from the drop hammer until the predetermined depth has been reached. The split spoon and drilling rod are removed from the hole to recover the sample. Upon recovery the split spoon is opened, the core sample inside visually inspected and logged for lithology, appearance, moisture content and odors by the project geologist.

To guard against cross contamination, all down-hole equipment is steam cleaned between holes. Additionally, all field utensils are scraped clean, rinsed with hexane, washed with lab detergent and rinsed repeatedly with deionized water between samples.

All samples were screened in the field for VOC emissions using a Photovac TIP II photoionization detector. This procedure involves placing the sample in its respective container, sealing the container, and allowing the organic vapor phase to reach equilibrium in the container; this takes approximately 15 minutes. Once equilibrium has been reached, the container lid is lifted in a fashion that minimizes the escape of the soil gases but permits entry of the instrument probe. A reading is taken on the gases contained in the headspace and recorded on the field log.

2 Photovac TIP II

The Photovac TIP II operates on the principle that individual chemical compounds have specific ionization potentials which are measured in electron volts (eV). Most of the atmospheric gases have ionization potentials of 12 eV or greater. The vast majority of

organic compounds, in particular those considered pollutants, have ionization potentials of 10.5 eV or less.

A small internal pump draws air (along with any contaminants) into the ionizations chamber of the TIP. This chamber is flooded with ultraviolet light emitted from a miniature lamp having an energy of 10.6 eV. Atmospheric gases such as nitrogen, oxygen, hydrogen and carbon dioxide have higher ionization energies (i.e. greater than 12 eV) and will not be detected by the TIP. However, the organic compounds, especially pollutants, with ionization potentials below the energy (10.6 eV) of the ultraviolet lamp in the TIP are ionized. Two small electrodes are located inside the ionization chamber, one positive and the other negative. The positive ions are attracted to the negative electrode; the negative ions are attracted to the positive electrode. A very sensitive current measuring circuit, or electrometer, detects these ions and produces a current. This current is in turn used to express "Total Ionizables Present" through the digital readout as they are relative to ambient air.

3 Groundwater Sampling

When bore hole depths are sufficient to reach the water table, groundwater will enter an open hole. Groundwater samples are collected when this condition occurs.

A stainless steel or Teflon(R) bailer is used to collect groundwater samples from the bore hole. These bailers are first washed with a non-phosphate detergent and triple rinsed with deionized water. Sometimes special sampling requirements mandate that additional rinses are necessary with nitric and hydrochloric acids, acetone or methanol and hexane. The clean

bailer is then lowered down the bore hole using clean polypropolene or nylon rope. Upon reaching groundwater, the bailer is submerged and allowed to fill with water. Care is taken not to agitate the groundwater unnecessarily so as to avoid oxygenation to the sample. The first bailer of water is emptied without any sampling. This serves to rinse the bailer. The bailer is lowered down the hole again and filled to begin sampling. Sample containers are filled directly from the bailer.

4 Common Field Practices and Procedures

To protect the sample and maintain sample integrity while minimizing possible cross contamination, numbers' of persons who handle samples in the field are kept to a minimum. Persons handling samples are required to wear clean latex or vinyl gloves. Soil samples are placed in borosilicate glass sample jars with Teflon(R) lined lids. Groundwater samples are placed in 40 mL. borosilicate glass vials with Teflon(R) lined septum tops for VOC analyses. Groundwater samples analyzed for metals content are placed in 1 L polyethylene containers. If groundwater sample filtering is necessary to determine dissolved metals, filtering will be performed in the field or by the laboratory as soon as possible after sampling. All sample containers have been specially cleaned prior to use. This cleaning meets or exceeds US EPA protocols. If new containers are to be used, then these containers are shipped from the factory under chain-of-custody seals and are not opened until the container is to be used for sampling.

All samples requiring refrigeration are promptly placed in ice chests that have been pre-cooled to a temperature of approximately 4°C with ice or "Blue Ice" freeze packs. Strict Chain-of-Custody procedures are

always observed. Chain-of-Custody forms are completed to the fullest extent possible prior to sample transport or shipment to the designated laboratory. These forms include the following information: Person Collecting Sample, Client whose sample was collected, Sample Identification, Time Collected, Source of Sample and Location, Analyses Required, Preservatives, Sample Matrix (e.g. soil, water, sludge, etc.), Receiving Laboratory, and Method of Shipment. The Chain-of-Custody forms are signed to identify the sample collector and to relinquish the sample to the receiving laboratory. At the laboratory receipt of the samples is acknowledged by signature. Should the primary laboratory subcontract any of the analysis to be performed on the sample(s), the Chain-of-Custody record is maintained by each sub-contracting laboratory. In the event of transport by common carrier, the packaging used to ship the samples is sealed with custody seals signed by the person sending the samples. In the event these seals have been broken or tampered with, the receiving laboratory must duly note any breach of custody seal integrity. The Chain-of-Custody forms for COAA site survey samples have been attached as Appendix I.

C ANALYTICAL PARAMETERS

ENCOTEC was contracted by the COAA to perform suitable site characterization for the properties described within this report. Using the soil boring and sampling procedures described above, ENCOTEC has chosen the following analytical parameters to identify any contamination resulting from activities conducted at these three COAA sites.

1 US EPA Method 8010, SW-846. Third Edition.

Method 8010 is a gas chromatographic (GC) analysis that determines the concentrations of certain haloge-

nated volatile organic compounds in water, soil and waste samples. This method requires the gas chromatograph to heat the column sufficiently to separate volatile organic compounds (VOC's) of interest as the sample is carried though the column by helium gas. The VOC's are separated as the sample passes through the column and detected by a electrolytic conductivity detector or halogen specific detector. Results are determined by comparing machine response for sample constituents, if any, to calibration reference standards that contain compounds of interest run on the same machine under the same operating conditions.

This list of compounds from Method 8010 are of particular interest in evaluating the COAA properties. These are common to degreasing solvents and other industrial chemicals that may have been used in previous years of operation.

Carbon tetrachloride	Cis-1,2-dichloroethene
Chlorobenzene	1,2-Dichloropropane
1,2-Dichlorobenzene	Cis-1,3-dichloropropene
1,3-Dichlorobenzene	Trans-1,3-dichloropropene
1,4-Dichlorobenzene	Methylene Chloride
1,1-Dichlorethane	1,1,1-Trichlorethane
1,2-Dichloroethane	1,1,2-Trichloroethane
Trans-1,2-dichloroethene	Trichloroethene

2 US EPA Method 8020, SW-846. Third Edition.

Method 8020 is a gas chromatographic (GC) analysis that determines the concentrations of certain aromatic volatile organic compounds in water, soil and waste samples. This method requires the gas chromatograph to heat the column sufficiently to separate volatile organic compounds (VOC's) of interest as the sample is carried though the column by helium gas. The VOC's are separated as the sample passes through the column and

detected by a photoionization detector (PID). Results are determined by comparing machine response for sample constituents, if any, to calibration reference standards that contain compounds of interest run on the same machine under the same operating conditions.

This list of compounds from Method 8020 are of particular interest in evaluating the COAA properties. The non-chlorinated compounds listed below are common to paints and petroleum compounds including automotive fuels. Chlorinated aromatic VOC's may be associated with certain pesticide and herbicide breakdown products or result directly from the formulation of these chemicals.

Benzene
Chlorobenzene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Ethyl Benzene
Toluene
Xylenes

3 MICHIGAN ACT 64 METALS

Act 64 contains the rules and regulations governing Michigan's hazardous waste, hazardous waste generators and disposal facilities. There are 10 metals identified as potentially hazardous under these laws: Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Selenium, Silver and Zinc. Accordingly, these metals have been selected to determine whether any characteristic wastes, (i.e. those with any of the 10 potentially leachable metals at or above regulatory action levels), have contaminated surface or subsurface soils and the groundwaters underlying COAA properties investigated in this assessment.

These 10 metals are common to most all industrial activities. Heavy metals are used in plating and metal finishing processes, in various metal alloys, and as

pigment compounds for paints and dyes. They are also used as wear reducing agents in fuels and lubricating oils, and in the power generating cells of industrial batteries. Contamination from heavy metals may be present at the three COAA properties from any or all of the above mentioned industrial applications.

Soil boring samples and groundwaters will be sampled and analyzed for the 10 Michigan Act 64 metals using the following methodologies. For metals barium, cadmium, chromium, copper, lead and zinc, SW-846 Method 6010 will be utilized. Arsenic and selenium will be analyzed using Methods 7061 and 7741, respectively. Mercury analysis is performed using Method 7470 for groundwaters and Method 7471 for soil boring samples.

4 POLYCHLORINATED BIPHENYL COMPOUNDS (PCB'S)

PCB's are regulated under the Toxic Substance Control Act (TSCA) of 1976 and its subsequent reauthorizations. Strict clean-up standards were placed into effect for areas where spills were known to have occurred and for areas of incidental PCB contamination. Samples will be taken to verify that none of the common forms of PCB's have contaminated the Hawkin's Property site. The analyses will conform to methodology described in SW-846 Method 8080. In the event that significant PCB's are discovered on this site, resampling and further characterization will be necessary to delineate the extent of contamination.

IV ASSESSMENT RESULTS AND DISCUSSION

Generally, analytical results reveal the properties to be relatively free of contamination with the exception of a few areas. Survey results showed little or no contamination in the majority of samples taken at all three of the COAA properties. Property assessments indicated little that could be considered indicative of contamination. Vegetation

appeared healthy and unstressed regardless of the activities ongoing at each site. Some surface soil staining was obvious, but not unexpected considering the number of vehicles and ongoing maintenance operations being performed. This was anticipated when considering past property usage. Analytical results reveal other areas of contamination that indicate potential spillage or inadvertent discharge of common industrial materials has occurred. Certain analyses show levels of some contamination above those that would be considered a site specific background level. The contaminates most obvious are the heavy metals, although trace levels of organics were detected in certain areas. These contaminates most likely include paints and fuels which were discharged to the surface soils.

A HAWKINS PROPERTY

The investigation of the Hawkins property was expanded over the other two properties due to the size of the site and the lack of knowledge regarding past activities that took occurred. Delays were encountered in gaining access to the property from its current owner. The property visitation was initially conducted in November, 1989. However, ENCOTEC was requested to leave the premises prior to survey completion. Approval was finally obtained on 28 November, 1989 per Ron Olson transmittal for Hawkins property access. Surface and sub-surface investigations took place on 4, 5 and 6 January, 1990.

1 GEOLOGICAL EVALUATION - HAWKINS PROPERTY

Eight exploratory soil borings were cored to a total depth of 20.5 feet below ground level on the Hawkins property. Boring logs have been included in this report as Appendix II. Subsurface soil conditions at the Hawkins property show some variability with depth. In general soils are predominantly sand and clay with minor inclusions of gravel and silt. In most

soil borings the uppermost two to three feet were composed of fine to coarse sand, fine to medium gravel and topsoil or mixed sand, gravel and topsoil with brick and concrete rubble. The source of the fill material is not known although expected in this low-lying area. A fine to medium sand was typically present below the fill to a depth of approximately six to ten feet below ground level. A sandy and/or silty clay was encountered below this sand in most cases. This usually extended beyond termination depth.

The Photovac TIP II(R) headspace reading were taken on all core samples collected. Overall, soil headspace readings were near background levels. The highest reading observed in the Hawkins property borings was 22.0ppm (H-1, 9.5-11ft.) and the lowest was 0.0 (H-2, 19-20.5ft.).

Groundwater was generally encountered at depths three to seven feet below surface level. All soil borings on the Hawkins property produced medium to heavy volumes of groundwater except H-6. Here groundwater volumes varied from light to heavy.

According to the Soil Survey of Washtenaw County, soil at the Hawkins site is described as Wasepi sandy loam (WaA). This soil has low available water capacity, slow to very slow runoff and moderately rapid permeability.

2 ANALYTICAL DATA INTERPRETATION

Appendix III contains the analytical data for Hawkins' Property surface and subsurface soil borings. Cluster charts have been prepared and attached as Appendix IV for inorganic parameters analyzed within the scope of this project. These specifically represent metals data in relation to a basic statistical

format of mean and a three sigma upper control limit specific to the soils of this particular site. The upper control or 3 sigma line is simply the mean for a particular parameter added to three times the standard deviation. In most remedial actions this type of basic statistical analyses determines clean levels of soil and areas of exceedance that are suspect to contamination. For comparison purposes ENCOTEC elected to use the Michigan Department of Natural Resources' "Michigan Background Soil Survey", compiled by the MDNR Waste Management Division, attached as Appendix V. It appears that the higher metals concentrations reside in upper elevations for the COAA assessment borings. Therefore, ENCOTEC chose the n-Saginaw topsoil results to do this comparison.

Groundwaters show no significant contamination by organic compounds. The only detectable contaminants were those common to all analytical laboratories. Metals analysis indicated only trace levels of heavy metals thus suggesting the groundwaters at the water table is relatively clean.

a Organics Data

Analysis of Hawkins property data show no specific organics contaminating the site at any significant concentrations within the list of compound that were screened.

i Soils

Samples taken from Hawkin's property soils show indication of past and present industrial activities. Debris and fill are duly noted over the entire property. Soil staining is obvious in areas surrounding buildings and in the vehicle yards and parking areas. Soils around the underground stor-

age tanks were stockpiled after removal, awaiting analyses. However, no organic compounds were detected at specific 8010 and 8020 detection levels. TIP II readings (discussed above) indicate light hydrocarbon (C9-C12) fractions may be present in bore samples taken around the underground storage tanks. However, these were not analyzed for nor specified in the proposal. Analytical data for Hawkins' site soil borings has been attached as Appendix III.

ii Groundwaters

Methylene chloride was evident in only one sample. This is common laboratory extraction solvent and routinely found in both method blanks and samples analyzed for volatile organic compounds. All other compounds were below the analytical detection limit.

b Metals Data

i Soil Borings

Heavy metals occur naturally in all soils. ENCOTEC believes that the existence of these metals in soils does not automatically indicate a contaminated site. Therefore, each heavy metal is addressed individually regarding its natural existence as opposed to being a site contaminant when that metal occurs above the analytical detection limit. This task is completed using the cluster chart mean and 3 sigma values specific to each analyses as discussed above.

Inorganic analyses reveal this site to relatively clean and free of heavy metals contamination when compared to Appendix V, "Michigan Background Soil Survey."

aa - The MDNR soil survey indicates arsenic at a typical concentration of 3.8 mG/kG. The average for the Hawkins Property was only 3.2 mG/kG. However, the MDNR soil survey standard deviation differed from that of the Hawkins Property by an additional 1.1. This would be expected in a site specific survey.

bb - Barium analyses revealed a mean of 57mG/kG with a standard deviation of 9.9 for the Hawkins property. This compares favorably to the MDNR Soil Survey at 41mG/kG and standard deviation values of 8.7.

cc - Cadmium measured 0.94 mG/kG with a standard deviation of 0.37. The MDNR Soil Survey indicates 1.0 mG/kG as typical background concentration with no standard deviation. Statistical results of this type suggest that the analytical result, 1.0mG/kG, was also the analytical detection limit for the MDNR survey.

dd - Chromium measured an average of 8.7 mG/kG with a standard deviation of 3.6 at the Hawkins site. The MDNR survey reveals typical background concentration for chromium at 12.4 with a standard deviation of 4.1.

ee - Hawkins Property copper concentrations were determined to be slightly higher than those of the MDNR Soil Survey. The total copper analytical mean was 21mG/kG with a standard deviation of 18 where as the MDNR soil survey reported typical copper concentrations at

11.6mG/kG with a standard deviation of 3.4. One sample, H-6 0-2ft., exceeded all other samples concentrations by almost an order of magnitude.

ff - Lead concentrations at the Hawkins site showed significantly higher concentration and variability than those reported in the MDNR Soil Survey. Hawkins Property soils samples measured between 5mG/kG and 350mG/kG for total lead concentrations. The majority were at or below 40 mG/kG. Those samples measuring above 40mG/kG are suspect site contaminates.

gg - Mercury concentrations in Hawkins' Property soils reveals a variability due to extreme outliers of two samples. The mean for mercury at the Hawkins site was determined to be 0.13mG/kG with a standard deviation of 0.21 as compared to the MDNR Soil Survey typical concentration of 0.11 with a standard deviation of 0.16. This comparison is misleading because five of the mercury values in this assessment were assumed to be the analytical detection limit and included on the cluster charts for graphical purposes. ENCOTEC believes this situation also applies to the mercury data present in the MDNR Soil Survey when considering the low average concentration and relatively high standard deviation. The Hawkins site samples H-2 0-2ft. and H-3 0-2ft. mercury results' are significantly higher than others sampled and analyzed at that location. These areas require further investigation as mercury contamination may be present.

hh - Selenium analysis shows acceptable concentrations when compared to MDNR Soil Survey typical concentrations. Soil samples from the Hawkins site show selenium concentrations to range from the analytical detection limit to 0.31mG/kG with a mean concentration of 0.12mG/kG and a standard deviation of .08. The MDNR Soil Survey reports typical selenium concentrations at 0.28mG/kG with a 0.09 standard deviation.

ii - Analysis for silver revealed concentrations below the analytical detection limit for almost all samples. Those samples with detectable silver barely exceeded the analytical detection limit. Therefore, further silver evaluation and discussion is not warranted.

jj - Statistics for zinc concentrations at the Hawkins site are biased by a single outlying sample, H-8 0-2ft., having a concentration of 141mG/kG. Zinc concentrations in soils at the Hawkins site range between 22 and 141mG/kG with a mean of 58mG/kG and a standard deviation of 27. Typical background soils concentrations as reported in the MDNR Soil Survey have a mean of 39mG/kG with a standard deviation of 19. The majority of the Hawkins property samples have concentrations less than 75mG/kG. The surface soils around H-8 may be suspect of zinc contamination and merit additional investigation.

ii Groundwaters

Groundwater samples taken for metals analysis were total metals samples. A total groundwater metal analysis includes any silts and sediments

that may be removed with the sample from the bore hole by the bailer. Therefore, some metals are resultantly reported above the analytical detection limit.

aa - Arsenic values for Hawkins site groundwaters range from the analytical detection limit to 0.046mG/L.

bb - Barium values for Hawkins site groundwaters range from 1.7 to 5.9mG/L.

cc - Cadmium values for Hawkins site groundwaters range from the analytical detection limit to 0.028mG/L.

dd - Chromium values for Hawkins site groundwaters range from the analytical detection limit to 0.28mG/L.

ee - Copper values for Hawkins site groundwaters range from 0.12 to 0.58mG/L.

ff - Lead values for Hawkins site groundwaters range from the analytical detection limit to 0.39mG/L.

gg - Mercury values for Hawkins site groundwaters were below the analytical detection limit.

hh - Selenium values for Hawkins site groundwaters range from the analytical detection limit to 0.012mG/L.

ii - Silver values for Hawkins site groundwaters were below the analytical detection limit.

jj - Zinc values for Hawkins site groundwaters range from 0.10 to 1.4mG/L.

c PCB's

Of the 10 surface soils sampled for PCB's, none contained measurable PCB's at 1part per million. See data attached as Appendix VI.

B NORTH MAIN STREET MUNICIPAL GARAGE

The investigation of the North Main Street Municipal Garage initiated with a site visitation on 12 October, 1989. Surface and sub-surface investigations took place on 16 and 20 October, 1989.

1 GEOLOGICAL EVALUATION - MUNICIPAL GARAGE

Four exploratory soil borings were drilled to a total depth of 20.5 feet below ground level at the Municipal Garage. Boring logs have been included in this report as Appendix VII. Subsurface soil conditions at the Municipal Garage site show only minor variations with depth. Soils are composed predominantly of fine and coarse sand and clayey sand with minor inclusions of fine to medium gravel. Heterogeneous composition of the uppermost four to five feet suggests that this material is fill. The source of the fill material is not known. Thin layers of silt are penetrated in soil borings NM-1 (18.5-20.5ft) and NM-3 (14.5-17.5ft). A silty clay was encountered in NM-3 (17.5-20.5ft).

The Photovac TIP II(R) headspace reading were taken on all core samples collected. Overall, soil headspace readings were near background levels. The highest readings were observed in the Municipal Garage property boring NM-1. These readings ranged from a low of 4.0ppm, NM-1 (19-20.5ft), and a high of 48ppm, NM-1 (4.0-6.0ft).

Groundwater was generally encountered at three feet below surface level in borings NM-1 and NM-3 and 6.8 feet in boring NM-4. Boring NM-2 did not encounter ground water although some water intrusion occurred at the bore hole depth of 20.5 feet to permit sampling and analysis.

According to the Soil Survey of Washtenaw County, soil at the Municipal Garage site is described as Fox sandy loam. This soil has moderate available water capacity, slow runoff and moderate permeability.

2 ANALYTICAL DATA INTERPRETATION

Appendix VIII contains the analytical data for Municipal Garage surface and subsurface soil borings. Cluster charts have been prepared and attached as Appendix IX for inorganic parameters analyzed within the scope of this project. These specifically represent metals data in relation to a basic statistical format of mean and a three sigma upper control limit specific to the soils of this particular site. In most remedial actions this type of basic statistical analyses determines clean levels of soil and areas of exceedance that are suspect to contamination. For comparison purposes ENCOTEC elected to use the Michigan Department of Natural Resources' "Michigan Background Soil Survey", compiled by the MDNR Waste Management Division, attached as Appendix V. It appears that the higher metals concentrations reside in upper elevations for the COAA assessment borings. Therefore, ENCOTEC chose the n-Saginaw topsoil results to do this comparison.

Groundwaters show no significant contamination by organic compounds. The only detectable contaminants were those common to ENCOTEC's analytical laboratories

during the time of analysis. Metals analysis indicated only trace levels of heavy metals thus suggesting the groundwater at the water table is relatively clean.

a Organics Data

Analysis of Municipal Garage data show no specific organics contaminating the site at any significant concentrations within the list of compound that were screened.

i Soils

Samples taken from Municipal Garage soils show indication of past and present industrial activities. Debris and fill are duly noted over the entire property. Soil staining is obvious in areas surrounding buildings and in the vehicle yards and parking areas. No organic compounds were detected at specific 8010 and 8020 detection levels. TIP II readings (discussed above) indicate light hydrocarbon (C9-C12) fractions may be present in bore samples taken from NM-1. However, these compounds were not analyzed for nor specified in the proposal. Data for Municipal Garage soil borings has been attached as Appendix VIII.

ii Groundwaters

Methylene chloride was evident in several samples. This is common laboratory extraction solvent and routinely found in both method blanks and samples analyzed for volatile organic compounds. Toluene was also detected but not quantified due to laboratory contaminants related to ENCOTEC construction activities. All other compounds were below analytical detection limits.

b Metals Data

i Soil Borings

Heavy metals occur naturally in all soils. ENCOTEC believes that the existence of these metals in soils does not automatically indicate a contaminated site. Therefore, each heavy metal is addressed individually regarding its natural existence as opposed to being a site contaminant when that metal occurs above the analytical detection limit. This task is completed using the cluster chart mean and 3 sigma values specific to each analyses as discussed above.

Inorganic analyses reveal this site to relatively clean and free of heavy metals contamination when compared to Appendix V, "Michigan Background Soil Survey."

aa - The MDNR soil survey indicates arsenic at a typical concentration of 3.8mG/kG. The average for this property was only 2.8mG/kG. However, the MDNR soil survey standard deviation, 0.8, differed from that of the Municipal Garage by an additional 1.3. This would be expected in a site specific survey.

bb - Barium analyses revealed a mean of 66mG/kG with a standard deviation of 28 for the Municipal Garage property. If the 129 and 85mG/kG results from borings NM-1 5-7ft and NM-3 0-2ft were excluded, the other analyses would compare favorably to the MDNR Soil Survey at 41mG/kG and a standard deviation value of 8.7.

cc - Cadmium measured an average of 0.35 mG/kG with a standard deviation of 0.17. The MDNR Soil Survey indicates 1.0 mG/kG as typical background concentration with no standard deviation. Statistical results of this type suggest that the analytical result, 1.0mG/kG, was also the analytical detection limit for the MDNR survey.

dd - Chromium measured an average of 7.1 mG/kG with a standard deviation of 3.1 at the Municipal garage. The MDNR survey reveals typical background concentration for chromium at 12.4 with a standard deviation of 4.1.

ee - Copper concentrations were comparable to those of the MDNR Soil Survey. The Municipal Garage copper analytical mean was 16mG/kG with a standard deviation of 9 where as the MDNR soil survey reported typical copper concentrations at 11.6mG/kG with a standard deviation of 3.4.

ff - Lead concentrations at the Municipal Garage showed significantly higher concentration and variability than those reported in the MDNR Soil Survey. Soil samples measured between 9.8 and 163mG/kG for total lead concentrations. The majority were at or below 30mG/kG. Those samples measuring above 40mG/kG are suspect site contaminates.

gg - Mercury concentrations in soils reveals little variability. The mean for mercury at the Municipal Garage was determined to be 0.04mG/kG with a standard deviation of 0.019 as compared to the MDNR Soil Survey typical concentration of 0.11 with a standard deviation of 0.16.

hh - Selenium analysis shows acceptable concentrations when compared to MDNR Soil Survey typical concentrations. Soil samples show selenium concentrations to range from the analytical detection limit to 1.4mG/kG with a mean concentration of 0.26mG/kG and a standard deviation of 0.46. The MDNR Soil Survey reports typical selenium concentrations at 0.28mG/kG with a 0.09 standard deviation. The 1.4mG/kG sample, NM-1 5-7ft, also contained other elevated metals results and suspected to be contaminated.

ii - Analysis for silver revealed concentrations below the analytical detection limit for almost all samples. Those samples with detectable silver barely exceeded the analytical detection limit. Therefore, further silver evaluation and discussion is not warranted.

jj - Zinc concentrations in soils at the site range between 31 and 92mG/kG with a mean of 56mG/kG and a standard deviation of 19. Typical background soils concentrations as reported in the MDNR Soil Survey have a mean of 39mG/kG with a standard deviation of 19.

ii Groundwaters

Groundwater samples taken for metals analysis were total metals samples. A total groundwater metal analysis includes the silts and sediments that may be removed with the sample from the bore hole by the bailer. Therefore, some metals are resultantly reported above the analytical detection limit.

aa - Arsenic values for this site's groundwaters range from the analytical detection limit to 0.052mG/L.

bb - Barium values for This site's groundwaters range from 2.9 to 5.2mG/L.

cc - Cadmium values for this site's groundwaters range from the analytical detection limit to 0.028mG/L.

dd - Chromium values for this site's groundwaters range from the analytical detection limit to 0.14mG/L.

ee - Copper values for this site's groundwaters range from 0.16 to 1.4mG/L.

ff - Lead values for this site's groundwaters range from 0.03 to 1.3mG/L.

gg - Mercury values for this site's groundwaters were below the analytical detection limit.

hh - Selenium values for this site's groundwaters range from the analytical detection limit to 0.012mG/L.

ii - Silver values for this site's groundwaters were below the analytical detection limit.

jj - Zinc values for this site's groundwaters range from 1.0 to 4.0mG/L.

c Total Petroleum Hydrocarbons

Per verbal request by COAA Risk Manager, total petroleum hydrocarbon samples were analyzed for borings NM-4 5-7 and NM-4 15-17 to identify potential UST leakage. When compared to standards issued by the Michigan State Fire Marshall's office for UST

remediations, these total petroleum hydrocarbon analyses exceed the 100ppm standard. The underground waste oil storage tank just to the west of boring NM-4 is suspect of leakage. See data attached as Appendix X.

C WEST WASHINGTON ST. OFFICES AND MAINTENANCE

The investigation of the North Main Street Municipal Garage initiated with a site visitation on 12 October, 1989. Surface and sub-surface investigations took place on 13 October, 1989.

1 GEOLOGICAL EVALUATION - WASHINGTON STREET

Four exploratory soil borings were drilled to a total depth of 20.5 feet below ground level at the Municipal Garage. Boring logs have been included in this report as Appendix XI. Subsurface soil conditions at the Washington Street site show little variation with depth. Soils are composed predominantly of fine and coarse sand with minor inclusions of fine to medium gravel. In most cases the upper 5 to 10 feet appeared to be highly heterogeneous suggesting that this material is fill. The source of the fill material is not known.

The Photovac TIP II(R) headspace reading were taken on all core samples collected. Overall, soil headspace readings were near background levels. However, somewhat elevated readings were observed at soil boring W-2 in the core sample recovered from the 10ft. depth interval. A significant oil and/or solvent odor was noted on the sample bore log along with significant soil staining.

Groundwater was generally encountered seven feet below surface level in all borings except W-4 where it

was encountered at 14.5ft. This corresponds to the location of the bore hole and the higher elevation of ground level.

According to the Soil Survey of Washtenaw County, soil at the Washington Street site is described as Matherton sandy loam (MdA). This soil has moderate available water capacity, slow to very slow runoff and moderate to rapid permeability.

2 ANALYTICAL DATA INTERPRETATION

Appendix XII contains the analytical data for Municipal Garage surface and subsurface soil borings. Cluster charts have been prepared and attached as Appendix XIII for inorganic parameters analyzed within the scope of this project. These specifically represent metals data in relation to a basic statistical format of mean and a three sigma upper control limit specific to the soils of this particular site. In most remedial actions this type of basic statistical analyses determines clean levels of soil and areas of exceedance that are suspect to contamination. For comparison purposes ENCOTEC elected to use the Michigan Department of Natural Resources' "Michigan Background Soil Survey", compiled by the MDNR Waste Management Division, attached as Appendix V. It appears that the higher metals concentrations reside in upper elevations for the COAA assessment borings. Therefore, ENCOTEC chose the n-Saginaw topsoil results to do this comparison.

Groundwaters show no significant contamination by organic compounds. The only detectable contaminants were those common to ENCOTEC's analytical laboratories during the time of analysis. Metals analysis indicated only trace levels of heavy metals thus suggesting the groundwaters at the water table is relatively clean.

a Organics Data

Analysis of Washington Street data show no specific organics contaminating the site at any significant concentrations within the list of compound that were screened.

i Soils

Samples taken from Municipal Garage soils show indication of past and present industrial activities. Debris and fill are duly noted over the entire property. Soil staining is obvious in areas surrounding buildings and in the vehicle yards and parking areas. No organic compounds were detected at specific 8010 and 8020 detection levels. TIP II readings (discussed above) indicate light hydrocarbon (C9-C12) fractions may be present in bore samples taken from W-2. However, these compounds were not analyzed for nor specified in the proposal. Chlorinated solvents were also detected in borings W-4 0-2ft and W-4 10-12ft. However, these were not quantified due to air contaminants occurring in the ENCOTEC laboratory and probably related to laboratory construction activities. Data for Washington Street soil borings has been attached as Appendix XII. No sample was obtained for boring W-2 0-2ft because a brick plugged the split spoon sampler opening.

ii Groundwaters

Methylene chloride was evident in several samples. This is common laboratory extraction solvent and routinely found in both method blanks and samples analyzed for volatile organic compounds. All other compounds were below analytical detection

limits. Analyses for Method 8010 and 8020 were not done on groundwater samples from W-4 due to sampling difficulties.

b Metals Data

i Soil Borings

Heavy metals occur naturally in all soils. ENCOTEC believes that the existence of these metals in soils does not automatically indicate a contaminated site. Therefore, each heavy metal is addressed individually regarding its natural existence as opposed to being a site contaminant when that metal occurs above the analytical detection limit. This task is completed using the cluster chart mean and 3 sigma values specific to each analyses as discussed above.

Inorganic analyses reveal this site to relatively clean and free of heavy metals contamination when compared to Appendix V, "Michigan Background Soil Survey."

aa - The MDNR soil survey indicates arsenic at a typical concentration of 3.8mG/kG. The average for this property was only 2.4mG/kG. However, the MDNR soil survey standard deviation, 0.8, differed from that of the Washington Street site by an additional 2.8. This can be attributed to boring W-2 5-7ft which had a reported 12mG/kG for total arsenic. This layer indicates potential contamination as is indicated by the other metals analyses.

bb - Barium analyses revealed a mean of 70mG/kG with a standard deviation of 55 for the Municipal Garage property. If the 211mG/kG

results from borings W-2 5-7ft and W-2 10-12ft were excluded, the other analyses would compare favorably to the MDNR Soil Survey at 41mG/kG and a standard deviation value of 8.7.

cc - Cadmium measured an average of 0.67mG/kG with a standard deviation of 0.90. The MDNR Soil Survey indicates 1.0 mG/kG as typical background concentration with no standard deviation. Statistical results of this type suggest that the analytical result, 1.0mG/kG, was also the analytical detection limit for the MDNR survey. Sample W-3 0-2 feet yielded a statistical outlier with a reported result of 3.0mG/kG.

dd - Chromium measured an average of 7.1 mG/kG with a standard deviation of 4.2 at Washington Street site. The MDNR survey reveals typical background concentration for chromium at 12.4 with a standard deviation of 4.1.

ee - Copper concentrations were biased by a single outlier at boring W-2 5-7ft. Washington Street samples ranged from 7.6 to 348mG/kG. The MDNR soil survey reported typical copper concentrations at 11.6mG/kG with a standard deviation of 3.4. Copper is a suspect contaminant at boring W-2.

ff - Lead concentrations at showed significantly higher concentration and variability than those reported in the MDNR Soil Survey. Soil samples measured between 7.7 and 348mG/kG for total lead concentrations. Many of these samples were above 40mG/kG. Lead is a suspect site contaminate as it was very common to paints, automotive fuels and lubricants.

gg - Mercury concentrations in soils reveals some variability. The mean for mercury at the Municipal Garage was determined to be 0.10mG/kG with a standard deviation of 0.17 as compared to the MDNR Soil Survey typical concentration of 0.11 with a standard deviation of 0.16. One outlier occurred at W-2 5-7ft with reported result of .51mG/kG.

hh - Selenium analysis shows acceptable concentrations when compared to MDNR Soil Survey typical concentrations for most of the samples taken from Washington Street. These samples show selenium concentrations to range from the analytical detection limit to 1.1mG/kG with a mean concentration of 0.21mG/kG and a standard deviation of 0.35. The MDNR Soil Survey reports typical selenium concentrations at 0.28mG/kG with a 0.09 standard deviation. The 1.1mG/kG sample, W-2 5-7ft, also contained other elevated metals results and suspected to be contaminated.

ii - Analysis for silver revealed concentrations below the analytical detection limit for almost all samples. Those samples with detectable silver barely exceeded the analytical detection limit. Therefore, further silver evaluation and discussion is not warranted.

jj - Zinc concentrations in soils at the site range between 31 and 307mG/kG with a mean of 96mG/kG and a standard deviation of 97. Typical background soils concentrations as reported in the MDNR Soil Survey have a mean of 39mG/kG with a standard deviation of 19. Outliers occurred at borings W-2 and W-3 that severely impact the mean and standard deviation for zinc.

ii Groundwaters

Groundwater samples taken for metals analysis were total metals samples. A total groundwater metal analysis includes any silts and sediments that may be removed with the sample from the bore hole by the bailer. Therefore, some metals are resultantly reported above the analytical detection limit. Metals' analysis for boring W-1 and W-4 groundwaters' is not reported due to sampling difficulties.

aa - Arsenic values for this site's groundwaters range from 0.043mg/L to 0.048mG/L.

bb - Barium values for This site's groundwaters range from 3.5 to 5.7mG/L.

cc - Cadmium values for this site's groundwaters range from 0.053 to 0.092mG/L.

dd - Chromium values for this site's groundwaters range from 0.40mG/l to 0.75mG/L.

ee - Copper values for this site's groundwaters range from 0.99 to 2.6mG/L.

ff - Lead values for this site's groundwaters range from 5.4 to 5.8mG/L.

gg - Mercury values for this site's groundwaters range from 0.0015 to 0.0020mG/L.

hh - Selenium values for this site's groundwaters range from 0.003 to 0.009mG/L.

ii - Silver values for this site's groundwaters range from below the analytical detection limit to 0.01mG/l, the analytical detection limit.

jj - Zinc values for this site's groundwaters range from 5.4 to 11mG/L.

V CONCLUSIONS

The evaluation of all data and data summaries submitted with this assessment reveals that limited contamination has occurred at the properties assessed within this survey. The most prevalent form of contamination for these properties appears to be heavy metals. These metals are common to paints, fuels and lubricating compounds that may have been spilled or improperly disposed over the years of municipal and industrial use. Also qualitatively identified but not quantified were petroleum hydrocarbons in the soils at all three sites. Some contamination was anticipated considering past and present usage of these properties. Underground storage tanks were present at all three sites. Only vague information could be obtained regarding the contents, operation and maintenance of these tanks. Most older storage tanks are suspect to leakage under these conditions.

Certain remedial activities may be necessary depending on the future intended use of these locations. ENCOTEC advises that further investigation be done before any remediation is performed. The following are tables of areas suspect to contamination and the contaminants believed present:

A HAWKINS' PROPERTY

SAMPLE LOCATION	SUSPECT CONTAMINANT
H-1 0-2ft	Total petroleum hydrocarbons, not quantified
H-1 5-7ft	Total petroleum hydrocarbons, not quantified
H-2 0-2ft	Mercury, 0.84mG/kG
H-6 0-2ft	Total Petroleum Hydrocarbons, not quantified; Copper, 75mG/kG; Lead, 366mG/kG
H-8 0-2ft	Zinc, 141mG/kG

B NORTH MAIN STREET MUNICIPAL GARAGE

SAMPLE LOCATION	SUSPECT CONTAMINANT
NM-1 0-2ft	Total Petroleum Hydrocarbons, not quantified
NM-1 5-7ft	Total Petroleum Hydrocarbons, not quantified; Barium, 129mG/kG; Selenium, 1.4mG/kG; Zinc, 92mG/kG
NM-3 0-2ft	Lead, 163mG/kG
NM-3 5-7ft	Lead, 42mG/kG
NM-4 5-7ft	Total Petroleum Hydrocarbons, 186mG/kG
NM-4 15-17ft	Total Petroleum Hydrocarbons, 225mG/kG

C WASHINGTON STREET SIGN SHOP, MAINTENANCE FACILITY AND OFFICES

SAMPLE LOCATION	SUSPECT CONTAMINANT
W-1 0-2ft	Mercury, 0.24mG/kG
W-2 5-7ft	Total Petroleum Hydrocarbons, not quantified; Arsenic, 12mG/kG; Barium, 211mG/kG; Copper, 348mG/kG; Lead, 228mG/kG; Mercury 0.51mG/kG; Selenium, 1.1mG/kG; Zinc, 307mG/kG
W-2 10-12ft	Total Petroleum Hydrocarbons, not quantified; Lead, 71mG/kG
W-3 0-2ft	Cadmium, 3.0mG/kG; Zinc, 215mG/kG
W-3 5-7ft	Lead, 113mG/kG

VI RECOMMENDATIONS

Although some soil contamination is evident, if remediated these soils probably would not be determined characteristically hazardous under Michigan Act 64 Regulations. There exist a few "hot spots" that have been located by this assessment. COAA has several options depending on future intended usage of these properties.

"Hot spots" contaminated with heavy metals and converted to residential or recreational areas should be remediated to eliminate the potential for incidental contact with the soils having these elevated metals. Estimation of necessary remediation costs and activities can only be determined by

performing sufficient additional sampling and analysis, adequate to define boundaries of contamination. Excavated soils would most likely be disposed in a sanitary landfill as it is doubtful that these soils have any hazardous characteristics associated with them under current hazardous waste regulations. Project costs would include additional sampling and analysis, preparation of detailed engineering drawings, excavation and removal contracts, contaminated soil disposal, and excavation backfilling.

Since no listed hazardous wastes were known to be generated or managed on these properties, there are no Act 64 Closure Standards to be met. Therefore, if the areas remain industrial, the soils contaminated with heavy metals could remain in place. This is not advisable, however, as there may be some long term liability associated with these actions depending on current and future statutes implemented by the State of Michigan. The cost of this scenario can not be estimated.

As an alternative to remediating these sites, a risk, based assessment could be performed to determine any associated hazards to human health and the environment. Risk assessments measure associated hazards at a site by looking at potential pathways for migration of contamination offsite when transported by air, surface water, or ground water and may also include risk factors associated with incidental contact. Values are assigned to each aspect of the risk evaluation. These values are entered into a computer model which assesses the site and determines the associated risk by the number of increased cases of cancer to humans and any potential negative impact to the environment. The cost of performing a risk assessment is usually site specific and can be high depending on the level of certainty required.

The underground storage tanks suspected of leaking must be remediated as mandated in Act 478 and amended by Act 150. Simply stated, the underground storage tank, free product from the tank that is uncovered in the excavation, contaminated soils and all appurtenances must be removed and properly disposed of. Clean-up recommendations have been assembled by MDNR and The Department of State Police, Fire Marshall's Division. Although these standards are published as draft guidance, enforcement will most likely be strictly interpreted to these standards as published. Costs of implementing these remediations can be controlled but not limited depending on the length of time the tank was leaking and quantity of tank contents released to the environment.

Parks and recreation Garage Remediation Systems Operation and Maintenance Progress Report

Prepared for:

The City of Ann Arbor
Public Services Department

NTH Project No. 13-501A-11
February 20, 2001

rec'd 2/23/01 ER

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Engineering Division
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P.O. Box 8647
Ann Arbor, Michigan 48107-8647

February 20, 2001
Proj. No. 13-501A-11

RE: Parks and Recreation Garage
Remediation Systems Operation and Maintenance Progress Report

Dear Ms. Rolla:

This is NTH Consultants, Ltd. (NTH) fifth progress report on the operation and maintenance of the remediation system at the Parks and Recreation Garage (NTH Project No. 13-501A), located at 415 West Washington Street. The progress report describes system operation and maintenance for the site from August 1, 2000 to January 31, 2001.

Routine Operation and Maintenance

In accordance with the monitoring requirements provided in the National Pollutant Discharge Elimination System (NPDES) General Permit No. MIG080000 and Certificate of Coverage MIG080506 for the Parks and Recreation Garage we have been performing routine site visits typically at a frequency of three visits per week. We also modified the system to increase the influence of the capture zone to effectively reduce the BTEX and PNA concentrations at MW-6.

The routine site visits consisted of a visual inspection, routine maintenance of equipment, sampling of the vapor stream at several locations with a photo ionization detector (PID), collection of water samples, and documentation of the remediation and treatment system performance. The specific dates on which the routine site visits occurred for each month are noted on the attached copies from the monthly data sheets for the site in Appendix B.

To increase the influence of the capture zone in the area of MW-6, the de-watering lines from well nos. 1, 2, and 3 were re-routed. The original system consisted of three1-inch diameter PVC lines leading from the wells into a single line extending to the treatment system. To enhance efficiency in the area of MW-6, we installed separate 1-inch lines leading from each well to the treatment system. The flow meters were then installed at the end of each line inside the shed. Currently we are removing unnecessary floats and trouble shooting the control panel to eliminate sporadic discharge and frequent prolonged shutdowns.

NPDES and Air Use Permit Compliance

Treated water samples were collected in accordance with the conditions of our NPDES permits, during the bi-weekly Operations and Maintenance (O&M) visits. Analytical results from the sampling events on the water indicate that concentrations of the regulated parameters (e.g., BTEX and MTBE) were below those allowed by our NPDES permits.

Approximately 4,351,530 gallons of groundwater were treated and discharged at the Parks and Recreation Garage. The reported discharge totals are from the beginning of August 2000 through January 2001. Effluent water samples were obtained on a weekly basis with exceptions in the months of September, December, and January due to system shutdowns. The analytical results indicated that BTEX, MTBE and PNA concentrations were below method detection limits in the effluent samples. The results for the water samples are summarized in the Discharge Monitoring Reports (DMRs) which we have been sending you on a regular basis. We have included the results of the analytical data in Appendix B along with the monthly O&M reports.

Long Term Monitoring Program

NTH completed quarterly groundwater monitoring events in October 2000 and January 2001. Monitoring included a determination of the water level, free product thickness, and the collection of water samples. The sample locations included monitoring well nos. MW-2, MW-6, MW-10, MW-11 and MW-112, and piezometer nos. P-1, P-2, and P-3. Except for MW-6 and MW-11, the analytical results for both sampling events indicated that BTEX, MTBE and PNAs were either below detection limits or below the Public Act 451, Part 213 Tier 1 residential, risk-based corrective action groundwater cleanup levels. Free product was not encountered in any of the sampling locations. The analytical results of the quarterly sampling are presented in Appendix A.

As you are aware, review of the groundwater analytical data (June 2000) for MW-11 suggested the possibility of a second source of unanticipated contamination. To confirm a second source, three geoprobes were completed (MW-11A, MW-11B, and MW-11C) around MW-11 to obtain water samples. As anticipated from the groundwater flow direction, the analytical results for MW-11A show benzene concentrations of 11-ppm. However, there was a sharp decrease in BTEX concentrations for the October quarterly sampling event at MW-11. January quarterly groundwater data for the BTEX concentrations at MW-11 was non-detect. We will be able to further evaluate these results once the treatment system is again fully operational.

As previously indicated, BTEX concentrations at MW-6 are not being effectively reduced by the system's current capture zone. The quarterly analytical data for the months of October 2000 and January 2001 demonstrates that the work completed to increase the influence of the zone of capture was necessary. We will know the results of our efforts upon completing the quarterly sampling event for April 2001.

Equipment Shutdowns

In general the system was completely operational in August, October, and November. The only documented de-watering system shutdowns for these months occurred on August 7 and 24, 2000. Extended de-watering system shutdowns occurred in the months of September, December, and January 2000. The system was either completely shut down or there was no discharge observed by our operator. To eliminate this problem we are trouble shooting the control panel and are removing unnecessary float mechanisms.

The vapor extraction system experienced shutdowns during the months of August 2000 and January 2001. These shutdowns were the result of carbon filter changes, power failures and maintenance.

Summary

In summary, we have maintained compliance with our NDPES General permit No. MIG080000 and Certificate of Coverage MIG080506 by completing routine site visits and collecting effluent water samples on a weekly basis. Water samples were not collected if the system was down or there was no visible discharge.

The remediation system at the Parks and Recreation garage has been effective at reducing the BTEX, MTBE and PNA concentrations at all monitoring wells with the exception of MW-6. To correct this we installed three separate lines leading from the de-watering wells. The modification will increase the pumping efficiency, which will increase the influence of the capture zone in the area of MW-6. At the completion of the quarterly groundwater monitoring scheduled for April 2001 we can appraise the effect of the modification.

Analytical data from the quarterly groundwater data for January 2001 indicated that BTEX, MTBE and PNA concentrations were below method detection limits at MW-11. This may indicate that the cause of the new source has been corrected.

Please call if you have any questions, or if we can provide additional information.

Sincerely,

NTH Consultants, Ltd.

John W. Hollar
Sr. Staff Engineer

James J. Parsons
Senior Project Engineer

JWH/JJP/pb

Attachments

TABLE 1
LONG-TERM MONITORING GROUNDWATER ANALYTICAL RESULTS
NTH PROJECT NO. 13-501A-10

PARKS AND RECREATION GARAGE REMEDIATION SYSTEM

Sample Location	Sample Date	Depth to Groundwater (Feet)	Depth to Free Product (Feet)	PARAMETER												Depth to Top - Bottom of Screen (Feet)
				Benzene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Toluene (ug/L)	MTBE (ug/L)	PNAs (ug/L)	Napthalene (ug/L)	2-Methylnapthalene (ug/L)	Dissolved Oxygen (mg/L)	pH	BOD5 (mg/L)	COD (mg/L)	
MW-2	08/12/97	5.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.9	7.6	ND	15	8.0 - 13.0
	10/10/98	--	--	ND	ND	6	ND	ND	ND	ND	ND	--	--	--	--	
	01/20/99	5.91	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	8.1	--	--	
	04/21/99	6.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7.6	--	--	
✓	1/19/01	5.82	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7.5	ND	ND	
MW-5	08/10/97	--	ND	ND	ND	ND	ND	ND	--	--	--	4.1	7.6	ND	7	
MW-6	04/15/99	7.15	ND	33	28	180	19	ND	77	49	28	--	7.2	ND	15	5.5 - 10.5
	1/11/00	6.35	ND	21	27	110	12	ND	92	57	35	--	7.8	6.2	ND	
	1/24/00	6.47	ND	26	NT	NT	NT	NT	NT	NT	NT	--	8.2	NT	NT	
	3/6/00		ND	26	NT	NT	NT	NT	NT	NT	NT	--		NT	NT	
	6/1/00		ND	45	NT	NT	NT	NT	NT	NT	NT	--		NT	NT	
	6/16/00		ND	22	76	240	12	ND	220	140	80	--		9.0	ND	
	10/31/00	6.71	ND	23	68	260	11	ND	261	170	91	--	7.3	5.2	45	
	1/19/01	6.25	ND	27	69	340	13	ND	157	89	68	--	7.3	ND	40	
MW-10	08/10/97	6.58	5.41	5100	2,700	12,000	5,700	ND	--	--	--	0.4	7.0	ND	7	4.0- 9.0
	05/23/98	5.88	ND	9,000	3,800	20,000	28,000	ND	670	470	200	5.9	7.6	ND	15	
	10/10/98	--	--	600	920	7,900	3,600	ND	840	390	250	--	--	--	--	
	04/20/99	7.02	ND	58	58	520	44	ND	ND	ND	ND	--	6.8	--	--	
	08/14/99	7.02	ND	22	28	86	7	ND	107	64	43	--	6.8	--	--	
	1/11/00	6.13	ND	12	57	140	2	ND	98	68	30	--	7.7	23.0	140	
	1/24/00	--	ND	10	NT	NT	NT	NT	NT	NT	NT	--	7.0	NT	NT	
	3/6/00	--	ND	ND	NT	NT	NT	NT	NT	NT	NT	--		NT	NT	
	6/1/00	--	ND	ND	NT	NT	NT	NT	NT	NT	NT	--		NT	NT	
	6/16/00	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	--		ND	ND	
	10/31/00	6.70	ND	ND	37	36	1	ND	5	5	ND	--	7.9	15.0	110	
	1/19/01	5.60	ND	ND	14	3	ND	ND	ND	ND	ND	--	7.5	ND	150	
MW-11	08/10/97	6.10	ND	ND	ND	ND	ND	ND	--	--	--	0.3	7.7	8.6	120	5.0 - 10.0
	01/20/99	6.19	ND	290	ND	36	2	ND	ND	8	ND	--	5.9	--	--	--
	04/15/99	6.35	ND	710	ND	100	ND	ND	ND	ND	ND	0.0	7.4	--	--	--
	1/11/00	6.14	ND	20	ND	ND	ND	ND	ND	ND	ND	--	7.5	19.0	220	
	3/6/00		ND	180	NT	NT	NT	NT	NT	NT	NT	--	--	NT	NT	
	6/1/00		ND	1,100	NT	NT	NT	NT	NT	NT	NT	--	--	NT	NT	
	6/16/00		ND	730	5	16	11	ND	19	19	ND	--	--	13.0	45	
	10/31/00	6.50	ND	200	ND	ND	ND	ND	ND	ND	ND	--	7.5	9.8	50	
	1/23/01	6.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7.5	6.4	34	
MW-112	08/12/97	5.49	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.0	7.5	2.1	21	12.0 - 17.0
	05/23/98	5.88	ND	30	1	ND	ND	ND	ND	ND	ND	5.9	7.6	ND	15	
	10/10/98	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	
	01/19/99	8.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7.1	--	--	
	04/21/99	6.62	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	8.1	--	--	
	08/14/99	--	--	ND	ND	ND	ND	--	ND	ND	ND	--	--	--	--	
	01/11/00	5.94	--	ND	ND	ND	ND	ND	ND	ND	ND	--	7.2	3.0	140	
	10/31/00	6.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7.4	ND	42	
	01/19/01	5.80	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7.5	ND	57	
R-1	08/10/97	6.12	ND	100	540	2,400	790	ND	--	--	--	0.2	7.9	22.0	110	
PIEZ-1	08/10/97	5.30	ND	ND	ND	ND	ND	ND	--	--	--	3.0	7.4	ND	21	13.0 - 15.0
	05/23/98	5.88	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.9	7.6	ND	15	
	10/10/98	--	--	84	280	350	120	ND	28	28	ND	--	--	--	--	
at 20'	01/19/99	5.88	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7.4	--	--	18.0 - 20.0
	08/14/99	--	--	ND	ND	ND	ND	--	ND	ND	ND	--	--	--	--	
	10/31/00	6.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7.6	ND	7.0	
	01/23/01	5.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7.4	ND	ND	
PIEZ-2	08/10/97	6.00	ND	ND	ND	ND	ND	ND	--	--	--	6	7.6	ND	17	13.0 - 15.0
at 20'	01/20/99	6.05	ND	17	32	440	390	ND	ND	ND	ND	--	7.0	--	--	18.0 - 20.0
at 20'	04/20/99	6.91	ND	4	11	190	120	ND	ND	ND	ND	--	7.3	--	--	
at 20'	08/14/99	6.91	ND	2	2	8	1	--	ND	ND	ND	--	7.3	--	--	
at 20'	10/31/00	6.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7.5	ND	12	
at 20'	1/23/01	5.96	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7.4	ND	5	
PIEZ-3	08/10/97	5.56	ND	5	2	7	2	ND				2.9	7.6	ND	15	13.0 - 15.0
	05/23/98	5.88	ND	75	1,200	1,800	55	ND	264	200	64	5.9	7.6	ND	15	
	10/10/98	--	--	2,700	760	1,400	12,000	ND	311	250	61	--	--	--	--	
	8/14/99			ND	ND	ND	ND		ND	ND	ND	--	--	--	--	
	1/11/00	--	--	ND	ND	ND	ND	--	ND	ND	ND	--	8	ND	ND	
	10/31/00	6.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7.3	ND	11	
	1/23/01	5.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	7	ND	ND	
P.A. 451 - PART213 TIER 1 RESIDENTIAL GROUNDWATER RISK-BASED SCREENING LEVELS (CGW)				5	74	280	790	240	various	260	260	-------	-------	-------	-------	-------

bco:1/31/01

NOTES:
(1) Samples collected by NTH Consultants and analyzed by Brighton Analytical Laboratories, Inc. of Brighton, Michigan.

City of Ann Arbor Parks & Recreation

Job# 13-501A-09

LIQUID PHASE		WELLS						TRANSFER		AIR STRIPPER				DISCHARGE			
		Pumping Rate			Manhole			Product	Pump	Blower	Sump	Blower	Blower	Pump	Current	Total	Outfall
Date	Operator	#1	#2	#3	#1	#2	#3	Tank	Pressure	Running	Level	Pressure	Motor	Pressure	Flow	Discharge	Inspection
8/1/00	TR																
8/2/00	TR													FLOW METER		844320	Y
8/3/00	TR													WAS STUCK		0864320	Y
8/7/00	SR	SYSTEM WAS OFF - PROBABLY FROM STORMS - TURNED SYS. ON.													Y	0864320	Y
8/8/00	SR									Y					0861340	0864340	Y
8/11/00	SR	WEEKLY SAMPLES													30	0913300	Y
8/14/00	SR														30	1027560	Y
8/17/00	SR														30	1160290	Y
8/18/00	SR	WEEKLY SAMPLES													30	1292300	Y
8/22/00	SR	WEEKLY SAMPLES													30	1327520	Y
8/23/00	SR														30	1508090	Y
8/24/00	SR	SYSTEM WAS OFF - POWER FAILURE? TURNED SYSTEM ON.													30	1540620	Y
8/29/00	SR														30	1578310	Y
8/30/00	SR														30	1778650	Y
8/31/00	SR	MONTHLY SAMPLES - pH = 7.07, D.O. = 7.35, TEMP = 17.1													30	1822730	Y
															30	1858800	Y

Sep-11-00 02:23pm From-
T-748 P.02/03 F-610

City of Ann Arbor Parks and Recreation

Job # 13-501A-09

VAPOR PHASE		SPARGE WELLS						SVE		PID			OTHER				
		Flow			Pressure			Pre KO	Post KO	Effluent	Interm	Influent	Carbon	Filter	Comments		
Date	Operator	#1	#2	#3	#1	#2	#3	Pressure	Pressure	ppm	ppm	ppm	Change	Change			
8/1/00	TR	VAPOR SIDE			TURNED		OFF										
8/2/00	TR																
8/3/00	TR																
8/7/00	SR																
8/8/00	SR																
8/11/00	SR																
8/14/00	SR																
8/17/00	SR																
8/18/00	SR																
8/22/00	SR																
8/23/00	SR																
8/24/00	SR																
8/29/00	SR																
8/30/00	SR																
8/31/00	SR																

Sep-11-00 02:24pm From-
T-748 P.03/03 F-610

Brighton Analytical L.L.C.™

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 08/11/00
Submit Date: 08/11/00
Report Date: 08/16/00

BA Report Number: **45115**
BA Sample ID: **AU00238**

Project Name: **Ann Arbor P&R/CRA Services**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:

Date: 8/16/00

Brighton Analytical L.L.C.™

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 08/18/00
Submit Date: 08/18/00
Report Date: 08/25/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **45374**
BA Sample ID: **AU01030**

Project Name: **CRA Services/Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
2-Methlynaphthalene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00

Brighton Analytical L.L.C.
TM

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 08/18/00
Submit Date: 08/18/00
Report Date: 08/25/00

BA Report Number: **45374**
BA Sample ID: **AU01030**

Project Name: **CRA Services/Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA GC/MS (extraction)	**Extracted**			3510/3550	ST	08/22/00
PNA Surrogate Recovery						
2-Fluorobiphenyl	**77**	%	60-140	8270/625	RG	08/24/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	08/22/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	08/22/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	08/22/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	08/22/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	08/22/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**96**	%	70-130	8021/602	BY	08/22/00

Brighton Analytical L.L.C.™

Brighton Analytical, L.L.C.
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Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 08/18/00
Submit Date: 08/18/00
Report Date: 08/25/00

BA Report Number: **45374**
BA Sample ID: **AU01030**

Project Name: **CRA Services/Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:

Date: 8/25/00

PNA re-extracted on 8/24/00.

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 08/22/00
Submit Date: 08/22/00
Report Date: 08/28/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **45435**
BA Sample ID: **AU01231**

Project Name: **CRA Services/Ann Arbor Parks & Rec**
Project Number: **10014-00**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
2-Methlynaphthalene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	08/24/00
PNA GC/MS (extraction)	**Extracted**			3510/3550	ST	08/24/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 08/22/00
Submit Date: 08/22/00
Report Date: 08/28/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **45435**
BA Sample ID: **AU01231**

Project Name: **CRA Services/Ann Arbor Parks & Rec**
Project Number: **10014-00**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Surrogate Recovery						
2-Fluorobiphenyl	**89**	%	60-140	8270/625	RG	08/24/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	08/23/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	08/23/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	08/23/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	08/23/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	08/23/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**94**	%	70-130	8021/602	BY	08/23/00

Brighton Analytical L.L.C.™

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2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 08/22/00
Submit Date: 08/22/00
Report Date: 08/28/00

BA Report Number: **45435**
BA Sample ID: **AU01231**

Project Name: **CRA Services/Ann Arbor Parks & Rec**
Project Number: **10014-00**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:

Date: 8/28/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 08/31/00
Submit Date: 08/31/00
Report Date: 09/06/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **45630**
BA Sample ID: **AU02051**

Project Name: **CRA Services/Ann Arbor Parks&Rec**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
Total Metal Analysis						
Total Lead	**Not detected**	mg/L	0.003	EPA 200.8	GW	09/05/00
Metal Water Total (digest)	**Digested**			3015	PR	09/01/00
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
2-Methlynaphthalene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 08/31/00
Submit Date: 08/31/00
Report Date: 09/06/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **45630**
BA Sample ID: **AU02051**

Project Name: **CRA Services/Ann Arbor Parks&Rec**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	09/05/00
PNA GC/MS (extraction)	**Extracted**			3510/3550	MB	09/05/00
PNA Surrogate Recovery						
2-Fluorobiphenyl	**106**	%	60-140	8270/625	RG	09/05/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	09/05/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	09/05/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	09/05/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	09/05/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	09/05/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**98**	%	70-130	8021/602	BY	09/05/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 08/31/00
Submit Date: 08/31/00
Report Date: 09/06/00

BA Report Number: **45630**
BA Sample ID: **AU02051**

Project Name: **CRA Services/Ann Arbor Parks&Rec**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:
Date: 9/6/00

City of Ann Arbor Parks and Recreation

Job # 13-501A-09

VAPOR PHASE		SPARGE WELLS						SVE		PID			OTHER				
		Flow			Pressure			Pre KO	Post KO	Effluent	Interm	Influent	Carbon	Filter	Comments		
Date	Operator	#1	#2	#3	#1	#2	#3	Pressure	Pressure	ppm	ppm	ppm	Change	Change			
9/5/00	SR																
9/7/00															WEEKLY SAMPLES		
9/8/00																	
9/12/00															WATER SIDE IS DOWN		
															VES IS NOW ON		
9/14/00																	
9/19/00																	
9/21/00																	
9/25/00																	
9/27/00																	
9/29/00															MONTHLY SAMPLES		

Oct 09 00 12:12p Dave Jaeger 1-810-323-3269 p.3

City of Ann Arbor Parks & Recreation

Job# 13-501A-09

LIQUID PHASE		WELLS						TRANSFER		AIR STRIPPER				DISCHARGE			
		Pumping Rate			Manhole			Product	Pump	Blower	Sump	Blower	Blower	Pump	Current	Total	Outfall
Date	Operator	#1	#2	#3	#1	#2	#3	Tank	Pressure	Running	Level	Pressure	Motor	Pressure	Flow	Discharge	Inspection
9/5/00	SR														30	2093020	Y
9/7/00	SR														30	2180610	Y
9/12/00	SR														30	2220730	Y
9/12/00	SR														0	2335780	Y
9/14/00	SR														0		
9/19/00	SR														0		
9/21/00	SR														0		
9/25/00	SR														0		
9/27/00	SR														0		
9/29/00	SR			PH=7.59			D.O.=8.62								24	2382030	Y

Oct 09 00 12:12p Dave Jaeger 1-810-323-3269 P.2

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

TM

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 09/07/00
Submit Date: 09/07/00
Report Date: 09/13/00

BA Report Number: **45748**
BA Sample ID: **AU02594**

Project Name: **CRA Services/Ann Arbor Parks&Rec**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
2-Methlynaphthalene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	09/08/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 09/07/00
Submit Date: 09/07/00
Report Date: 09/13/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **45748**
BA Sample ID: **AU02594**

Project Name: **CRA Services/Ann Arbor Parks&Rec**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA GC/MS (extraction)	**Extracted**			3510/3550	ST	09/08/00
PNA Surrogate Recovery						
2-Fluorobiphenyl	**96**	%	60-140	8270/625	RG	09/08/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	09/11/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	09/11/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	09/11/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	09/11/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	09/11/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**94**	%	70-130	8021/602	BY	09/11/00

Brighton Analytical, L.L.C.
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Sample Date: 09/07/00
Submit Date: 09/07/00
Report Date: 09/13/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **45748**
BA Sample ID: **AU02594**

Project Name: **CRA Services/Ann Arbor Parks&Rec**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:
Date: 9/13/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 09/29/00
Submit Date: 09/29/00
Report Date: 10/05/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **46215**
BA Sample ID: **AU04512**

Project Name: **CRA Services/Ann Arbor Parks & Rec**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
Total Metal Analysis						
Total Lead	**0.003**	mg/L	0.003	EPA 200.8	GW	10/03/00
Metal Water Total (digest)	**Digested**			3015	PR	10/02/00
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
2-Methlynaphthalene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00

Brighton Analytical, L.L.C.
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Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 09/29/00
Submit Date: 09/29/00
Report Date: 10/05/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **46215**
BA Sample ID: **AU04512**

Project Name: **CRA Services/Ann Arbor Parks & Rec**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/02/00
PNA GC/MS (extraction)	**Extracted**			3510/3550	MB	09/29/00
PNA Surrogate Recovery						
2-Fluorobiphenyl	**85**	%	60-140	8270/625	RG	10/02/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	10/04/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	10/04/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	10/04/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	10/04/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	10/04/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**104**	%	70-130	8021/602	BY	10/04/00

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Sample Date: 09/29/00
Submit Date: 09/29/00
Report Date: 10/05/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **46215**
BA Sample ID: **AU04512**

Project Name: **CRA Services/Ann Arbor Parks & Rec**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:
Date: 10/5/00

City of Ann Arbor Parks and Recreation

Job # 13-501A-09

VAPOR PHASE		SPARGE WELLS						SVE		PID			OTHER				
		Flow			Pressure			Pre KO	Post KO	Effluent	Interm	Influent	Carbon	Filter	Comments		
Date	Operator	#1	#2	#3	#1	#2	#3	Pressure	Pressure	ppm	ppm	ppm	Change	Change			
10/3/00	SR												↓				
10/5/00	SR																
10/6/00	SR									0.0	0.0	0.0			WEEKLY SAMPLES		
10/9/00	SR																
10/11/00	SR														WEEKLY SAMPLES		
10/12/00	SR																
10/17/00	SR																
10/18/00	SR														WEEKLY SAMPLES		
10/19/00	SR																
10/25/00	SR																
10/26/00	SR																
10/27/00	SR									0.0	0.0	0.0			MONTHLY SAMPLES		

Nov-08-00 02:59pm From-
T-964 P.03/03 F-802

City of Ann Arbor Parks & Recreation

Job# 13-501A-09

LIQUID PHASE		WELLS						TRANSFER		AIR STRIPPER				DISCHARGE				
		Pumping Rate			Manhole			Product	Pump	Blower	Sump	Blower	Blower	Pump	Current	Total	Outfall	
Date	Operator	#1	#2	#3	#1	#2	#3	Tank	Pressure	Running	Level	Pressure	Motor	Pressure	Flow	Discharge	Inspection	
10/3/00	SR									Y					24	2528550	Y	
10/5/00	SR														24	2596450		
10/6/00	SR														24	2625210		
10/9/00	SR														24	2713540		
10/11/00	SR														24	2800890		
10/12/00	SR														24	2844530		
10/17/00	SR														25	3016680		
10/18/00	SR														24	3051990		
10/19/00	SR														24	3095160		
10/25/00	SR														24	3310890		
10/26/00	SR														24	3348030		
10/27/00	SR														25	3378130		

Nov-08-00 02:59pm From-
T-964 P.02/03 F-802

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 10/06/00
Submit Date: 10/06/00
Report Date: 10/11/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **46338**
BA Sample ID: **AU04967**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
2-Methlynaphthalene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/09/00
PNA GC/MS (extraction)	**Extracted**			3510/3550	MB	10/09/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 10/06/00
Submit Date: 10/06/00
Report Date: 10/11/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **46338**
BA Sample ID: **AU04967**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Surrogate Recovery						
2-Fluorobiphenyl	**103**	%	60-140	8270/625	RG	10/09/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	10/09/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	10/09/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	10/09/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	10/09/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	10/09/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**104**	%	70-130	8021/602	BY	10/09/00

Brighton Analytical, L.L.C.
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Phone: (810) 229-7575 FAX: (810) 229-8650

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 10/06/00
Submit Date: 10/06/00
Report Date: 10/11/00

BA Report Number: **46338**
BA Sample ID: **AU04967**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:
Date: 10/11/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 10/11/00
Submit Date: 10/11/00
Report Date: 10/16/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **46438**
BA Sample ID: **AU05410**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
2-Methlynaphthalene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/12/00
PNA GC/MS (extraction)	**Extracted**			3510/3550	KW	10/11/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 10/11/00
Submit Date: 10/11/00
Report Date: 10/16/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **46438**
BA Sample ID: **AU05410**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Surrogate Recovery						
2-Fluorobiphenyl	**86**	%	60-140	8270/625	RG	10/12/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	10/13/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	10/13/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	10/13/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	10/13/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	10/13/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**97**	%	70-130	8021/602	BY	10/13/00

Brighton Analytical, L.L.C.
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Phone: (810) 229-7575 FAX: (810) 229-8650

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 10/11/00
Submit Date: 10/11/00
Report Date: 10/16/00

BA Report Number: **46438**
BA Sample ID: **AU05410**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:
Date: 10/16/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 10/18/00
Submit Date: 10/18/00
Report Date: 10/24/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **46590**
BA Sample ID: **AU05985**

Project Name: **CRA Services/Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
2-Methlynaphthalene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/20/00
PNA GC/MS (extraction)	**Extracted**			3510/3550	ST	10/19/00

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Sample Date: 10/18/00
Submit Date: 10/18/00
Report Date: 10/24/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **46590**
BA Sample ID: **AU05985**

Project Name: **CRA Services/Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Surrogate Recovery						
2-Fluorobiphenyl	**93**	%	60-140	8270/625	RG	10/20/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	10/20/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	10/20/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	10/20/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	10/20/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	10/20/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**99**	%	70-130	8021/602	BY	10/20/00

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To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 10/18/00
Submit Date: 10/18/00
Report Date: 10/24/00

BA Report Number: **46590**
BA Sample ID: **AU05985**

Project Name: **CRA Services/Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:
Date: 10/24/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

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To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 10/27/00
Submit Date: 10/27/00
Report Date: 11/03/00

BA Report Number: **46854**
BA Sample ID: **AU06966**

Project Name: **CRA/Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
Total Metal Analysis						
Total Lead	**Not detected**	mg/L	0.003	EPA 200.8	GW	10/30/00
Metal Water Total (digest)	**Digested**			3015	PR	10/30/00
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00

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To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 10/27/00
Submit Date: 10/27/00
Report Date: 11/03/00

BA Report Number: **46854**
BA Sample ID: **AU06966**

Project Name: **CRA/Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
2-Methlynaphthalene	**5**	ug/L	5	EPA 625	RG	10/30/00
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	10/30/00
PNA GC/MS (extraction)	**Extracted**			3510/3550	KW	10/27/00
PNA Surrogate Recovery						
2-Fluorobiphenyl	**79**	%	60-140	8270/625	RG	10/30/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	11/01/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	11/01/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	11/01/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	11/01/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	11/01/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**98**	%	70-130	8021/602	BY	11/01/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 10/27/00
Submit Date: 10/27/00
Report Date: 11/03/00

BA Report Number: **46854**
BA Sample ID: **AU06966**

Project Name: **CRA/Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:

Date: 11/3/00

City of Ann Arbor Parks & Recreation

Job# 13-501A-09

LIQUID PHASE		WELLS						TRANSFER		AIR STRIPPER				DISCHARGE				
		Pumping Rate			Manhole			Product	Pump	Blower	Sump	Blower	Blower	Pump	Current	Total	Outfall	
Date	Operator	#1	#2	#3	#1	#2	#3	Tank	Pressure	Running	Level	Pressure	Motor	Pressure	Flow	Discharge	Inspection	
11/1/00	SR	25	OFF	OFF				EMPTY		YES					25	3562260	YES	
11/2/00	SR	25													25	3607620		
11/3/00	SR	25													25	3642770		SAMPLES
11/6/00	SR	26													26	3742440		
11/8/00	SR	24													24	3813360		SAMPLES
11/10/00	SR	24													24	3886250		
11/15/00	SR	25													25	4072830		
11/16/00	SR	24													24	4108880		SAMPLES
11/17/00	SR	25													25	4127420		
11/21/00	SR	24													24	4277060		
11/22/00	SR	25													25	4306650		SAMPLES
11/25/00	SR	25													25	4420650		
11/28/00	SR	24													24	4523080		
11/30/00	SR	25													25	4594980		MONTHLY

City of Ann Arbor Parks and Recreation

Job # 13-501A-09

VAPOR PHASE		SPARGE WELLS						SVE		PID			OTHER				
		Flow			Pressure			Pre KO	Post KO	Effluent	Interm	Influent	Carbon	Filter	Comments		
Date	Operator	#1	#2	#3	#1	#2	#3	Pressure	Pressure	ppm	ppm	ppm	Change	Change			
11/1/00	SR																
11/2/00	SR																
11/3/00	SR									0.0	0.0	0.0			WEEKLY SAMPLES		
11/6/00	SR																
11/8/00	SR														WEEKLY SAMPLES		
11/10/00	SR																
11/15/00	SR																
11/16/00	SR														WEEKLY SAMPLES		
11/17/00	SR																
11/21/00	SR																
11/22/00	SR														WEEKLY SAMPLES		
11/25/00	SR																
11/28/00	SR																
11/30/00	SR									0.0	0.0	0.0			MONTHLY SAMPLES		
															PH: 7.15 D.O. = 9.62		

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 11/03/00
Submit Date: 11/03/00
Report Date: 11/08/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **46999**
BA Sample ID: **AU07533**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
2-Methlynaphthalene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	11/07/00
PNA GC/MS (extraction)	**Extracted**			3510/3550	KW	11/06/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 11/03/00
Submit Date: 11/03/00
Report Date: 11/08/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **46999**
BA Sample ID: **AU07533**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Surrogate Recovery						
2-Fluorobiphenyl	**117**	%	60-140	8270/625	RG	11/07/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	11/07/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	11/07/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	11/07/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	11/07/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	11/07/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**100**	%	70-130	8021/602	BY	11/07/00

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To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 11/03/00
Submit Date: 11/03/00
Report Date: 11/08/00

BA Report Number: **46999**
BA Sample ID: **AU07533**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:

Date: 11/8/00

Brighton Analytical, L.L.C.
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Brighton, Michigan 48116
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TM

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 11/08/00
Submit Date: 11/08/00
Report Date: 11/10/00

BA Report Number: **47095**
BA Sample ID: **AU07906**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
2-Methlynaphthalene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	11/09/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 11/08/00
Submit Date: 11/08/00
Report Date: 11/10/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **47095**
BA Sample ID: **AU07906**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA GC/MS (extraction)	**Extracted**			3510/3550	MB	11/09/00
PNA Surrogate Recovery						
2-Fluorobiphenyl	**84**	%	60-140	8270/625	RG	11/09/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	11/09/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	11/09/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	11/09/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	11/09/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	11/09/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**98**	%	70-130	8021/602	BY	11/09/00

Brighton Analytical, L.L.C.
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To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 11/08/00
Submit Date: 11/08/00
Report Date: 11/10/00

BA Report Number: **47095**
BA Sample ID: **AU07906**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:

Date: 11/10/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

TM

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 11/16/00
Submit Date: 11/16/00
Report Date: 11/27/00

BA Report Number: **47296**
BA Sample ID: **AU08845**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
2-Methlynaphthalene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	11/20/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 11/16/00
Submit Date: 11/16/00
Report Date: 11/27/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **47296**
BA Sample ID: **AU08845**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA GC/MS (extraction)	**Extracted**			3510/3550	ST	11/17/00
PNA Surrogate Recovery						
2-Fluorobiphenyl	**100**	%	60-140	8270/625	RG	11/20/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	11/16/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	11/16/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	11/16/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	11/16/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	11/16/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**90**	%	70-130	8021/602	BY	11/16/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 11/16/00
Submit Date: 11/16/00
Report Date: 11/27/00

BA Report Number: **47296**
BA Sample ID: **AU08845**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:
Date: 11/27/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 11/22/00
Submit Date: 11/22/00
Report Date: 11/29/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **47417**
BA Sample ID: **AU09308**

Project Name: **Ann Arbor Parks & Rec./CRA Services**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
2-Methlynaphthalene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	11/27/00
PNA GC/MS (extraction)	**Extracted**			3510/3550	ST	11/24/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 11/22/00
Submit Date: 11/22/00
Report Date: 11/29/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **47417**
BA Sample ID: **AU09308**

Project Name: **Ann Arbor Parks & Rec./CRA Services**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Surrogate Recovery						
2-Fluorobiphenyl	**82**	%	60-140	8270/625	RG	11/27/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	11/28/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	11/28/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	11/28/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	11/28/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	11/28/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**104**	%	70-130	8021/602	BY	11/28/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

Sample Date: 11/22/00
Submit Date: 11/22/00
Report Date: 11/29/00

BA Report Number: **47417**
BA Sample ID: **AU09308**

Project Name: **Ann Arbor Parks & Rec./CRA Services**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:
Date: 11/29/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 11/30/00
Submit Date: 11/30/00
Report Date: 12/04/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **47546**
BA Sample ID: **AU09843**

Project Name: **Ann Arbor Parks & Rec./CRA Services**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
Total Metal Analysis						
Total Lead	**Not detected**	mg/L	0.003	EPA 200.8	GW	12/01/00
Metal Water Total (digest)	**Digested**			3015	PR	12/01/00
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	12/01/00

T-070 P.03/03 F-895
Jan-08-01 12:11pm From-

City of Ann Arbor Parks and Recreation

Job # 13-501A-09

VAPOR PHASE		SPARGE WELLS						SVE		PID			OTHER				
		Flow			Pressure			Pre KO	Post KO	Effluent	Interm	Influent	Carbon	Filter	Comments		
Date	Operator	#1	#2	#3	#1	#2	#3	Pressure	Pressure	ppm	ppm	ppm	Change	Change			
12/1/00	SR																
12/6/00	SR									0.0	0.0	0.0					
12/7/00	SR																
12/8/00	SR																
12/13/00	SR																
12/14/00	SR																
12/15/00	SR														SAMPLES		
12/18/00	SR																
12/21/00	SR																
12/22/00	SR																
12/27/00	SR																
12/28/00	SR					NTH PERSONEL ON SITE WORKING ON SYSTEM											
12/29/00	SR																

T-070 P.02/03 F-895
Jan-08-01 12:11pm From-

City of Ann Arbor Parks & Recreation

Job# 13-501A-09

LIQUID PHASE		WELLS						TRANSFER		AIR STRIPPER				DISCHARGE				
		Pumping Rate			Manhole			Product	Pump	Blower	Sump	Blower	Blower	Pump	Current	Total	Outfall	
Date	Operator	#1	#2	#3	#1	#2	#3	Tank	Pressure	Running	Level	Pressure	Motor	Pressure	Flow	Discharge	Inspection	
12/1/00	SR									Y					25	4630990	Y	
12/6/00	SR									Y					24	4796660	Y	
12/7/00	SR									Y					24	4818540	Y	
12/8/00	SR									Y					0	4819870	Y	
12/13/00	SR									Y					22	4925730	Y	
12/14/00	SR									Y					22	4957410	Y	
12/15/00	SR									Y					23	4978140	Y	
12/18/00	SR									Y	ALL DOORS & LOCKS			FROZEN	?	?	Y	
12/21/00	SR									Y					0	5115680	Y	
12/22/00	SR									Y					0	5115680	Y	
12/27/00	SR									Y					0	5115680	Y	
12/28/00	SR									Y					0	5115680	Y	
12/29/00	SR									N					0	5188680	N	

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 12/15/00
Submit Date: 12/15/00
Report Date: 12/21/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **47779**
BA Sample ID: **AV00677**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Analysis						
Acenaphthene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Acenaphthylene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Anthracene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Benzo(a)anthracene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Benzo(a)pyrene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Benzo(b)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Benzo(ghi)perylene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Benzo(k)fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Chrysene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Dibenzo(a,h)anthracene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Fluoranthene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Fluorene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Indeno(1,2,3-cd)Pyrene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
2-Methlynaphthalene	**5**	ug/L	5	EPA 625	RG	12/20/00
Naphthalene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Phenanthrene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
Pyrene	**Not detected**	ug/L	5	EPA 625	RG	12/20/00
PNA GC/MS (extraction)	**Extracted**			3510/3550	KW	12/18/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 12/15/00
Submit Date: 12/15/00
Report Date: 12/21/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **47779**
BA Sample ID: **AV00677**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
PNA Surrogate Recovery						
2-Fluorobiphenyl	**61**	%	60-140	8270/625	RG	12/20/00
Volatile Analysis						
Benzene	**Not detected**	ug/L	1	EPA 602	BY	12/18/00
Ethyl benzene	**Not detected**	ug/L	1	EPA 602	BY	12/18/00
MTBE	**Not detected**	ug/L	5	EPA 602	BY	12/18/00
Toluene	**Not detected**	ug/L	1	EPA 602	BY	12/18/00
Xylenes(total)	**Not detected**	ug/L	3	EPA 602	BY	12/18/00
Volatile Surrogate Recovery						
Isopropyl Benzene	**88**	%	70-130	8021/602	BY	12/18/00

Brighton Analytical, L.L.C.
2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 12/15/00
Submit Date: 12/15/00
Report Date: 12/21/00

To: NTH Consultants, Ltd.
38955 Hills Tech Drive
Farmington Hills, MI 48333-3432

BA Report Number: **47779**
BA Sample ID: **AV00677**

Project Name: **Ann Arbor Parks & Rec.**
Project Number: **10014-10**
Sample ID: **Effluent**

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date

DL=Detection Limit as recommended by MDEQ

Released by:

Date: 12/21/00

City of Ann Arbor Parks & Recreation

Job# 13-501A-09

LIQUID PHASE		WELLS						TRANSFER		AIR STRIPPER				DISCHARGE				
		Pumping Rate			Manhole			Product	Pump	Blower	Sump	Blower	Blower	Pump	Current	Total	Outfall	
Date	Operator	#1	#2	#3	#1	#2	#3	Tank	Pressure	Running	Level	Pressure	Motor	Pressure	Flow	Discharge	Inspection	
1/3/01	SR									N					0	5188600		NTH WORKING ON SYSTEM
1/4/01	SR																	
1/5/01	SR																	
1/8/01	SR																	
1/9/01	SR																	
1/11/01	SR																	
1/17/01	SR																	
1/18/01	SR																	
1/19/01	SR														0	5188720		
1/25/01	SR														0	~~5188720~~		
1/31/01	SR														NOW 3 DIFFERENT FLOW METERS.			

Storage Tank Information Database

Storage Tank Facilities List

Facility and Tank Details

Facility Information:
Facility ID:00008428
Parks & Recreation Bldg
415 W Washington St, Ann Arbor, MI 48103
Phone# : (734) 994-6696

Owner Information:
City of Ann Arbor
PO Box 8647 100 N Fifth Ave, Ann Arbor, MI 48107
Phone# : (734) 794-6000

Tank ID	Tank Status	Capacity (in gallons)	Installation Date	Substance Stored	Tank Release Detection	Piping Release Detection	Piping Material	Piping Type	Construction Material	Impressed Device
1	Removed from Ground	6000	4/2/1982 12:00:00 AM	Gasoline			Bare Steel,Galvanized Steel	Suction: No Valve At Tank	Asphalt Coated or Bare Steel	No
2	Removed from Ground	6000	4/2/1982 12:00:00 AM	Gasoline			Galvanized Steel	Suction: No Valve At Tank	Asphalt Coated or Bare Steel	No
3	Removed from Ground	1000	4/2/1982 12:00:00 AM	Diesel			Galvanized Steel		Asphalt Coated or Bare Steel	No

Release Information

Leak ID	LUST Site Name	Discovery Date	Substance Released	Release Status	Closed Date	Evaluation	Land Use Restrictions
C-0549-89	Parks & Recreation Bldg	09/19/1989		Open			
C-1222-89	Parks & Recreation Bldg	12/20/1989		Open			
C-0371-92	Parks & Recreation Bldg	03/06/1992	Gasoline	Open			

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The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Airport Plaza Park
Ann Arbor, Michigan 48108

(313) 747-9300 Phone
(313) 747-9229 Fax

- Groundwater and Soil Contamination Assessment and Cleanup
- Underground Storage Tank Management
- Industrial Environmental Audits
- Property Development Risk Assessments

September 21, 1989

Karen Clark
Environmental Quality Analyst
Environmental Response Division
Michigan Department of Natural Resources
Jackson District Office
301 E. Louis Glick Bldg.
Jackson, MI 49201

RECEIVED
SEP 25 1989
JACKSON DISTRICT
☐ ENVIR. RESPONSE DIV.
☐ SURFACE WATER QUALITY DIV.
☐ WASTE MGMT DIV

RE: Suspected Release from UST at 415 W. Washington, City of Ann Arbor

Dear Karen:

As we discussed on the telephone yesterday, the City of Ann Arbor owns a 1,000 gallon underground diesel fuel storage tank at property located at 415 W. Washington in Ann Arbor. The tank was tightness tested on 9/18/89. On 9/19/89 test results were verbally reported by the tank tester to TGI, and by TGI to the City of Ann Arbor, indicating a suspected leak. A leak rate of 0.253 gal/hr was indicated; however, the tank tester felt that an air pocket in the tank or an underground pipe could have been responsible for the test results. The City notified both the State and local Fire Marshall of the suspected release on 9/19/89.

The tank has been taken out of service and steps are being taken to confirm the release. A fuel supply contractor was contacted to pump out the tank at the earliest possible time. In the interim fuel has been pumped into City vehicles to the extent practicable; the tank should be emptied by today.

At present the City is planning excavation and removal of the tank, which will include the required site assessment. We will continue to keep you informed of project developments.

Sincerely,

Steve Koster, P.E.
Engineering Manager

xc: Dan Cullen, Risk Management, City of Ann Arbor
Homayoon Pirooz, Engineering, City of Ann Arbor
Ed Soper, Fire Marshall

The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Airport Plaza Park
Ann Arbor, Michigan 48108

(313) 747-9300 Phone
(313) 747-9229 Fax

- Groundwater and Soil Contamination Assessment and Cleanup
- Underground Storage Tank Management
- Industrial Environmental Audits
- Property Development Risk Assessments

January 9, 1990

Ms. Betty Michalski
M.D.N.R. Jackson District
301 East Louis Glick Building
Jackson, Mi. 49201

RECEIVED
JAN 16 1990
JACKSON DISTRICT
ENVIR. RESPONSE DIV.
SURFACE WATER QUALITY DIV
WASTE MGMT DIV

RE: City of Ann Arbor
415 W. Washington Tank Removal Site
Initial Abatement Measures (20 Day Report)

Dear Betty:

The following is a summary of the tank pull conducted at 415 W. Washington, which is owned and operated by the City of Ann Arbor. A 1,000 gallon diesel underground storage tank was pulled and temporarily stored on site on December 19, 1989.

The tank was overlain by a concrete slab which ranged from one to three feet in thickness. Once the concrete slab was removed, the tank was exposed approximately one foot beneath the soil surface. There was a gasoline odor present as soon as the soil adjacent to the tank was disturbed.

Upon removal of the tank from the pit, one grab sample of soil was collected from each end of the pit then heated prior to being screened with an HNU Meter. The sample from the north end screened 100 parts per million (ppm). The south end, where the fill pipe was located, screened 110 ppm. Neither ground water nor free product were encountered.

One soil sample was collected at each end of the tank pit and submitted to an analytical laboratory for BTEX analysis. Results of the analysis can be found in the table below and also in the analytical report provided.

SAMPLE	DATE COLLECTED	TOTAL BTEX (PPM)
Soil (north)	12/19/89	< 0.01
Soil (south)	12/19/89	< 0.01

Upon removal, the tank appeared to be in relatively good condition. The release was reported to the State of Michigan Fire Marshal Hotline Service on December 20, 1989 by Dan Cullen, City of Ann Arbor Risk Manager. The tank was rendered useless by cutting a hole in the side, cleaned per TGI specifications which are based on API recommended practice 1604, and transported to a disposal facility.

The site was backfilled to original grade level as the area supports heavy traffic and an open pit would have posed a safety hazard.

While soil at the site appeared discolored, analytical laboratory results indicate BTEX is not present in the soil, which meets MDNR suggested cleanup criteria as outlined in the State of Michigan Fire Marshal UST Newsletter dated June, 1989. Based on the analytical data, the City of Ann Arbor requests you consider the site closed. If you disagree with the stated conclusion, please contact TGI or Dan Cullen immediately.

If you have any questions regarding the tank pull operation, please contact Jenny Gosling, Project Engineer.

Sincerely,

Michael F. Leahy
Field Hydrogeologist

Reviewed by:

Jenny E. Gosling
Project Engineer

Enclosure
cc: Dan Cullen, Risk Manager
City of Ann Arbor

The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Airport Plaza Park
Ann Arbor, Michigan 48108

(313) 747-9300 Phone
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- Groundwater and Soil Contamination Assessment and Cleanup
- Underground Storage Tank Management
- Industrial Environmental Audits
- Property Development Risk Assessments

January 19, 1990

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JAN 22 1990
JACKSON DISTRICT
☐ ENVIR. RESPONSE DIV.
☐ SURFACE WATER QUALITY DIV.
☐ WASTE MGMT DIV

Ms. Betty Michalski
MDNR Jackson District
301 E. Louis Glick Building
Jackson, MI 49201

Dear Betty:

RE: CITY OF ANN ARBOR
20 DAY REPORTS, UST REMOVAL SITES

As discussed in our phone conversation on January 17, 1990, TGI has complied sampling chronologies for the following four sites:

Site:	Address
o Huron Hills Golf Course	3465 E. Huron River Drive,
o Fire Station #2	1510 E. Stadium Boulevard,
o Leslie Golf Course	2120 Traver Road, and
o 415 W. Washington	415 W. Washington.

Field log books for the sites in question have been reviewed and dates for HNU readings, excavation and sampling for each site are outlined below.

Huron Hills Golf Course

A reading of 40 parts per million (ppm) was obtained on 12/13/89 at 12:15 a.m. Following the positive reading, a total of 30 cubic yards of soil was removed from the site. The post excavation HNU reading was 4 ppm. On 12/18/89 an additional 10 cubic yards of soil was removed. Soil samples were collected from the pit bottom on 12/21/89 and submitted to an analytical laboratory for analysis. Results were discussed in the 20 day report. The site was backfilled on 1/3/90.

Fire Station #2

An HNU reading of 100 ppm was obtained from the 500 gallon gasoline tank pit located in the front of the station on 12/14/89. Following the positive reading, a total of 15 cubic yards of soil was removed. Two post excavation soil samples were collected from the pit bottom and submitted to an analytical laboratory for analysis. The pit was backfilled immediately as the excavation endangered the adjacent active diesel tank.

Readings of 2 to 9 ppm were collected from the 1000 gallon fuel oil tank pit located at the rear of the station on 12/13/89 and 12/14/89. A total of 30 cubic yards were excavated from the pit on 12/14/89. Two post excavation soil samples were also collected from the pit bottom on 12/14/89 and submitted to an analytical laboratory for analysis. The pit was backfilled on 1/3/90.

Results from both tank pits were discussed in the 20 day report and a copy of the analytical laboratory report will be forwarded as soon as it becomes available.

Leslie Golf Course

An HNU reading of 3 ppm was obtained on 12/18/89. A total of 15 cubic yards of overburden soil was removed the same day and stockpiled on site. Soil samples were collected from the pit bottom on 12/18/89 and submitted to an analytical laboratory for analysis. Results of the analysis were present in the 20 day report. The stockpiled soil was removed from the site on 1/2/90 and the pit was backfilled on 1/3/90.

415 W. Washington

An HNU reading of 100 ppm was obtained on 12/19/89. Two soil samples were collected from the pit the same day and then the pit was backfilled. Results of the analysis were outlined in the 20 day report.

If you have any questions or require further information, please contact myself or Steve Koster, Engineering Manager.

Sincerely,

Jenny E. Gosling

Jenny E. Gosling
Project Engineer

cc: Dan Cullen, Risk Manager
City of Ann Arbor

The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Airport Plaza Park
Ann Arbor, Michigan 48108

(313) 747-9300 Phone
(313) 747-9229 Fax

- Groundwater and Soil Contamination Assessment and Cleanup
- Underground Storage Tank Management
- Industrial Environmental Audits
- Property Development Risk Assessments

March 13, 1992

Mr. Terry Hiske
Michigan Department of Natural Resources
Environmental Response Division
Jackson District Office
301 East Louis Glick Highway
Jackson, Michigan 49201

RE: 20 Day Report - Initial Abatement Measures
City of Ann Arbor Parks and Recreation Building
415 West Washington Street
Ann Arbor, Michigan 48103

Dear Terry:

The Traverse Group, Inc. (TGI) has been retained by the owner/operator of the UST at the facility named herein, to conduct UST removal and associated environmental consulting services.

The following report describes the initial abatement measures taken to date at the site. If you have any questions or require additional information, please contact TGI at (313) 747-9300.

Sincerely,

Peter J. Weglinski
Staff Engineer

Reviewed By:

Jenny E. Gosling
Operations Manager

RECEIVED
MAR 16 1992
JACKSON DISTRICT
ENVIR RESPONSE DIV
SURFACE WATER QUALITY DIV
WASTE MGMT DIV.

enc.

cc: Dan Cullen, City of Ann Arbor Risk Manager

Name of Facility:	City of Ann Arbor Parks and Recreation Building
Name of Contact:	Dan Cullen, City of Ann Arbor Risk Manager
Contact Phone Number:	(313) 994-6696
Facility Address:	415 West Washington Street Ann Arbor, Michigan 48103

Date Release reported to the State Police/State Fire Marshal UST Division: March 6, 1992.

Number of USTs: **one**
Tank size(s): 6,000 gallon
Chemical or liquid that was stored in the tank: Unleaded Gasoline
No other liquids or chemicals were known to have been previously stored in the UST(s).

Description of the release: UST system failed tank tightness test and hydrocarbon odors observed from the soil.

Component of UST system from which the release occurred: product line near tank

Steps taken to prevent further release:

1) Tank was pumped dry of liquid contents on **March 9, 1992**;

Steps taken to mitigate/monitor fire and/or safety hazards:

1) Tank was pumped dry of liquid contents;

Free hydrocarbon product was not noted in the subsurface.

No vapors or free product were detected in nearby subsurface structures.

Soil Samples taken: none.

Following the removal of the underground storage tank, initial remediation will consist of contaminated soil being excavated and transported for disposal at a properly secured landfill. The MDNR will be given notification prior to remediation.

Tank location in reference to the facility buildings can be seen on the attached site sketch.

The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Airport Plaza Park
Ann Arbor, Michigan 48108

(313) 747-9300 Phone
(313) 747-9229 Fax

- Groundwater and Soil Contamination Assessment and Cleanup
- Underground Storage Tank Management
- Industrial Environmental Audits
- Property Development Risk Assessments

March 13, 1992

Mr. Terry Hiske
Michigan Department of Natural Resources
Environmental Response Division
Jackson District Office
301 East Louis Glick Highway
Jackson, Michigan 49201

RECEIVED
MAR 16 1992
JACKSON DISTRICT
ENVIR RESPONSE DIV
SURFACE WATER QUALITY DIV
WASTE MGMT DIV

RE: Tank Removal and Soil Excavation
City of Ann Arbor
Parks and Recreation Building
415 West Washington Street
Ann Arbor, Michigan

Dear Terry:

This letter is a follow up to our telephone conversation on March 13, 1992 concerning the above referenced site. As discussed in our conversation, the City of Ann Arbor requests MDNR permission to excavate immediately following the tank removal without waiting for analytical results. You stated that this was permissible and to proceed with the excavation.

A confirmed release for the tank system was faxed to the Michigan State Police \ State Fire Marshal Underground Storage Tank Division on March 6, 1992. A 20-day report for the release has been forwarded to you. The Traverse Group, Inc. (TGI) will use a photo-ionization detector to screen soil samples from the excavation. We have tentatively scheduled the tank removal and soil excavation for Wednesday March 18, 1992.

Thank you for your time. Please call if you have any questions.

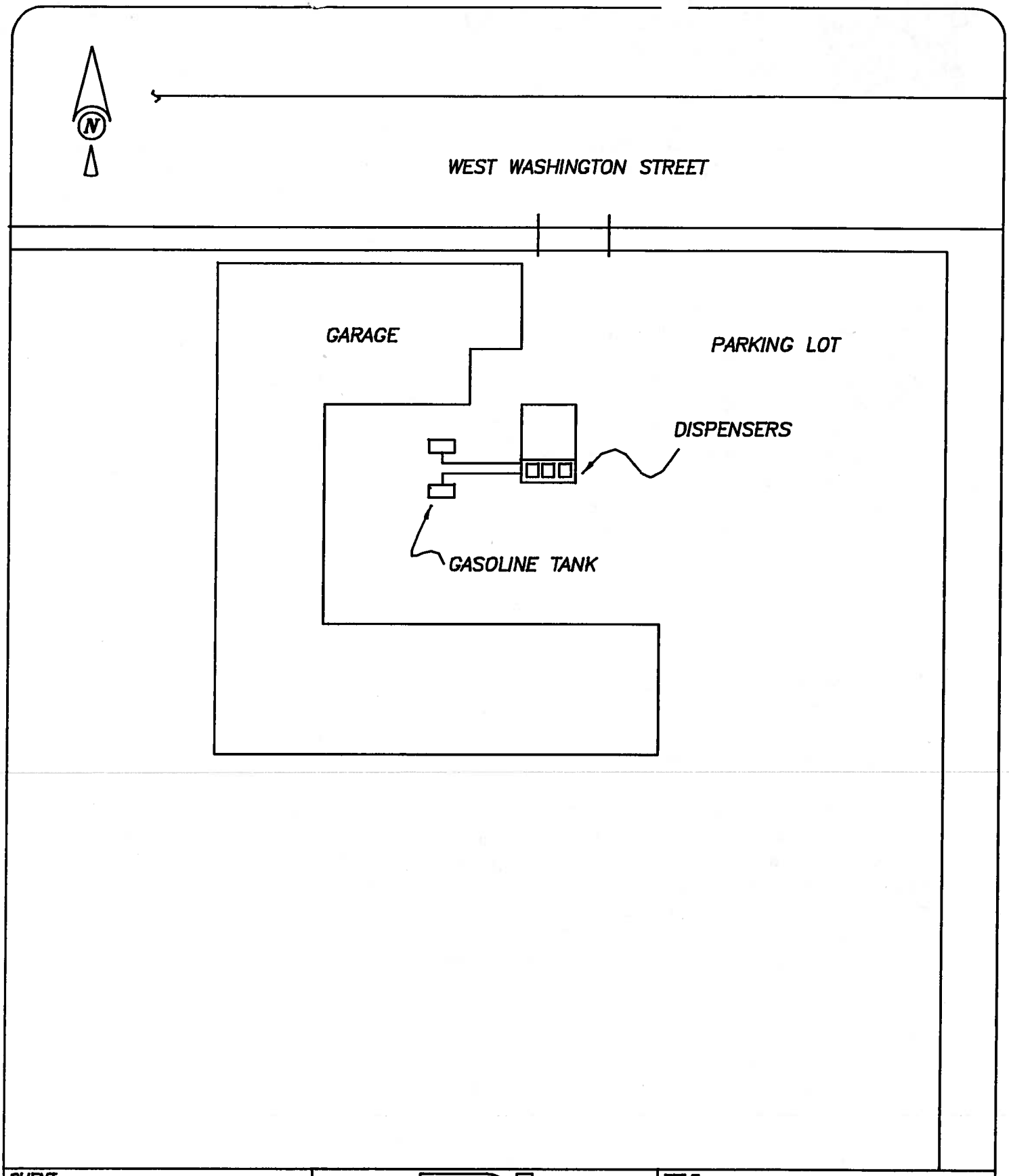
Sincerely,

Peter J. Weglinski
Staff Engineer

Reviewed By:

Jenny E. Gosling
Operations Manager

cc: Dan Cullen, City of Ann Arbor Risk Manager



CLIENT CITY OF ANN ARBOR	The Traverse Group, Inc. 3772 Plaza Drive, Suite 5 Airport Plaza Park Ann Arbor, Michigan 48108	TITLE SITE SKETCH	
SITE PARKS AND RECREATION BUILDING		DATE 3-11-92	ENGINEER PW
LOCATION 415 W. WASHINGTON STREET ANN ARBOR, MI 48103		PROJECT 672A	DWG CAA92040
		SCALE NTS	DRAFTED BY: GH

The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Airport Plaza Park
Ann Arbor, Michigan 48108

(313) 747-9300 Phone
(313) 747-9229 Fax

- Groundwater and Soil Contamination Assessment and Cleanup
- Underground Storage Tank Management
- Industrial Environmental Audits
- Property Development Risk Assessments

April 17, 1992

TGI REF: 672B

Terry Hiske
Jackson District Office
MDNR-Environmental Response Division
Jackson State Office Building
301 East Louis Glick Highway
Jackson, Michigan 49201

RE: 45 Day Report
The City of Ann Arbor Parks and Recreation Garage
415 West Washington Street
Ann Arbor, Michigan 48103

Dear Terry:

The Traverse Group, Inc. (TGI) has been retained by the owner/operator of the underground storage tank (UST) systems at the facility named herein, to conduct environmental consulting services relating to permanent closure of two UST systems at the above mentioned site.

The following is a site characterization report, free product recovery report and investigative work plan, all of which are part of the 45 Day release report requirements per the Leaking Underground Storage Tank Act (1988 P.A.478, as Amended). A confirmed release of petroleum hydrocarbons was reported on March 6, 1992 to the Michigan State Police/State Fire Marshal Division. Information relating to this release can be found in the enclosed report. Initial Abatement measures completed to date for the Parks and Recreation Garage are outlined in the 20 Day Report submitted to you by TGI, dated March 13, 1992. At this time, it is believed that both the soil and ground water have been impacted at the site.

If you have any questions, please call Mark Tussing, Project Coordinator, or myself at your earliest convenience.

Sincerely,

Eric P. Helzer
Staff Engineer

Reviewed by,

Mark Tussing
Project Coordinator

45 DAY REPORT
FOR A UNDERGROUND STORAGE TANK
RELEASE AT
THE CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 WEST WASHINGTON STREET
ANN ARBOR, MICHIGAN 48103

APRIL 17, 1992

SUBMITTED TO:

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
JACKSON DISTRICT OFFICE
301 EAST LOUIS GLICK HIGHWAY
JACKSON, MICHIGAN 49201

PROVIDED BY:

THE TRAVERSE GROUP, INC.
3772 PLAZA DRIVE
SUITE 5
ANN ARBOR, MICHIGAN 48108

45 DAY REPORT
FOR A UNDERGROUND STORAGE TANK
RELEASE AT
THE CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 WEST WASHINGTON STREET
ANN ARBOR, MICHIGAN 48103

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45 DAY REPORT
FOR A UNDERGROUND STORAGE TANK
RELEASE AT
THE CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 WEST WASHINGTON STREET
ANN ARBOR, MICHIGAN 48103

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45 DAY REPORT
FOR A UNDERGROUND STORAGE TANK
RELEASE AT
THE CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 WEST WASHINGTON STREET
ANN ARBOR, MICHIGAN 48103

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45 DAY REPORT
FOR A UNDERGROUND STORAGE TANK
RELEASE AT
THE CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 WEST WASHINGTON STREET
ANN ARBOR, MICHIGAN 48103

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E Environmental Protection Agency Hazardous Waste Manifests

Water/Product Pumped (03/20/92) E-1
Water/Product Pumped (03/23/92) E-2

F Tank Disposal Receipt

Tank Disposal Receipt (03/24/92) F-1

G Landfill Receipts

Landfill Soil Disposal Receipt
(#397986) G-1
(#398016) G-2
(#398007) G-3
(#397994) G-4
(#398048) G-5
(#398049) G-6
(#398037) G-7
(#398038) G-8

45 DAY REPORT
FOR A UNDERGROUND STORAGE TANK
RELEASE AT
THE CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 WEST WASHINGTON STREET
ANN ARBOR, MICHIGAN 48103

1.0 SITE CHARACTERIZATION REPORT

1.1 Site Description

The City of Ann Arbor's Parks and Recreation Garage is located at 415 West Washington between First and Third streets. The Ann Arbor Railroad is adjacent to the site on the east side. The Well Log Site Sketch, which illustrates the site in reference to topographic features, roads and railroads, can be found in Appendix A, page A-1. The site is secured with a 6 foot chain-link fence around its perimeter. The structures currently on the site are a garage building in a U-shape, and a storage shed. The garage houses and services the vehicles and equipment used by the City of Ann Arbor Parks and Recreation Department.

The unleaded gasoline and diesel underground storage tanks (USTs) addressed in this report were located approximately 20 feet southwest of the storage shed underneath 2-3 feet of reinforced concrete. Figure 2 (page A-2 of Appendix A), Site Sketch, provides an overview of the site showing the location and dimensions of the buildings. Each former UST had a maximum capacity of 6000 gallons. The tanks were within 3 feet of each other in a parallel arrangement and had dimensions of 28 feet in length by 5 feet 10 inches in diameter. The tanks were constructed of bare steel without an interior lining. One tank stored diesel fuel and the other unleaded gasoline. The release that is the subject of this report occurred from the unleaded gasoline UST used to fuel the City of Ann Arbor Parks and Recreation vehicles. The bottoms of the USTs were situated on top of natural soil at approximately 8-9 feet below grade. The Site Sketch Detail, shows the USTs location in reference to nearby structures and can be found in Appendix A , page A-3.

1.2 Nature and Description of the Release

1.2.1 Nature of the Release

A confirmed release was reported to the Michigan State Police/State Fire Marshal Division by The Traverse Group, Inc. (TGI) on March 6, 1992 as a result of a failed tank tightness test on March 6, 1992 at 9:50 am. There was also visual confirmation of the release from the product line near the tank.

1.2.2 Description of the Release

At this time, it is believed that both the soil and ground water resources have been impacted as a result of the release. The release was due to the UST system's corroded product line. The quantity of the release is not accurately known.

1.2.3 Steps Taken to Prevent Further Release

On March 9, 1992, both tanks (unleaded and diesel) were pumped dry of their liquid contents. The USTs were triple rinsed on March 19, 1992 by Carlo Environmental Technologies (CET) of Mt. Clemens Michigan and removed on March 20, 1992.

1.3 Available Sources and Site Investigation Data

1.3.1 Surrounding Population

The City of Ann Arbors Parks and Recreation Garage is located at 415 West Washington in the City of Ann Arbor, Section 29 of Ann Arbor Township, Washtenaw County. The 1990 census indicated that the population of the City of Ann Arbor is 109,592. The site is surrounded by both commercial and residential properties.

1.3.2 Water Quality

Information collected to determine aquifer vulnerability, potable and non-potable water sources, and surface water impact, is outlined in detail below.

1.3.2.1 *Well Logs*

The Washtenaw County Environmental Health Department was contacted for the purpose of locating wells within a one mile radius of the site. The following is a summary of the well logs located in the area. The Township, Range, and Section Numbers of the wells are included in the first column. If further information is required, please refer to the attached well logs in Appendix B, pages B-1 to B-20.

Township, Range, Section #	Number of Wells	Average Depth to Bottom of Well (feet)	Use
T2S, R6E, Sect. 19	3	192	Domestic
T2S, R6E, Sect. 28	4	112	Science
T2S, R6E, Sect. 29	2	132	Domestic
T2S, R6E, Sect. 30	2	100	Domestic
T2S, R6E, Sect. 31	2	213	Domestic
T2S, R6E, Sect. 32	6	235	Test Well
T2S, R6E, Sect. 33	1	56	Domestic

1.3.2.2 *Surface Water*

The nearest major surface bodies of water are First and Second Sister Lakes, located approximately 2 miles west of the site. In addition, the Huron River is located approximately 3/4 miles northeast of the site. The location of the Huron River, which is the nearest surface water body, can be seen on Figure 1, Appendix A, page A-2. The Allen Creek Drain which at one time was a surface body and serves as the drainage basin for the area. It is located approximately 50 feet east of the site.

1.3.3 Use and Locations of Potentially Affected Wells

Based on the well logs located within a one mile radius of the site, it is believed that the wells have not been affected by the release from the UST systems. The aquifer that has been impacted is a perched aquifer located approximately six feet below grade and is not the aquifer used for domestic wells in the area. The aquifer utilized for the domestic wells is located at approximately 89 feet below grade and is overlaid by approximately 35 feet of impermeable clay. The domestic wells located within a one mile radius of the site (Figure 1, Appendix A page A-1), are believed to have been unaffected due to their location with respect to the site and information obtained from the well logs. The wells closest to the

site are described in the well logs contained in Appendix B, pages B-8 and B-10. The commercial/residential area immediately surrounding the site is served by municipal water.

1.3.4 Subsurface Soil Conditions

The well logs obtained from the Washtenaw County Environmental Health Department employ descriptions commonly used by the well construction industry and were not used to summarize the site geology. As part of the free product investigation three monitor wells were installed. The free product investigation is outlined in section 1.5. The geology of the area was summarized from information obtained during the placement of the free product investigation monitoring wells on March 27, 1992.

Observations made during placement of the monitoring wells indicate that the soil in the immediate tank pit area appears to be backfill material. The soil strata observed during placement of the three monitoring wells can be summarized according to the following table:

Depth Below Grade (feet)	Soil Strata
0 - 8	Fill Material
8 - 13	Medium Grained Sands

Note: Ground Water at approximately 6 feet below grade.

If further information is required please refer to the attached well logs for both the domestic wells located in Appendix B and the monitoring wells located in Appendix C. The locations of the monitoring wells in reference to the pit can be seen in Appendix A, page A-3.

1.3.5 Locations of Subsurface Utility Lines and Sewers

Twelve-inch storm sewers are located approximately ten feet north and approximately 40 feet east of the former USTs. The storm sewers empty into the Allen Creek Drain which is located approximately 50 feet east of the former UST site. An underground electrical line is located northeast of the former USTs connecting the garage to the storage shed. Utility locations in relation to the former USTs can be seen on Figure 4 in Appendix A, page A-4. The figure is a blueprint copy obtained from the Ann Arbor City Records.

1.3.6 Climatological Conditions

Climatological conditions are typical of those encountered in southeast Michigan.

1.3.7 Land Use

The site is currently used by the City of Ann Arbor Parks and Recreation Department. The garage located at the site houses and services the vehicles and equipment.

1.4 Results of Site Characterization

The following information has been used to characterize the site: the initial abatement measures taken on-site prior to and following confirmation of the release and the information provided in Section 1.2 through 1.3 of this report.

The following conclusions are made based on site characterization: the extent of the impacted resources has not been determined, both soil and ground water have been impacted, and the public health does not appear to be at an immediate risk.

1.5 Free Product Investigation

The following section contains a chronological order of events concerning the discovery of free product, monitoring well placement to address free product, measurement of product levels in the monitoring wells and a free product recovery system design.

1.5.1 Discovery of Free Product

A confirmed release from the 6000 gallon unleaded gasoline UST was reported to the Michigan State Police/Fire Marshal Division on March 6, 1992 by TGI as a result of a failed tank tightness test. There was also a visual confirmation of the release which was a result of corroded piping. The quantity of the release is not accurately known. The tank was pumped dry of liquid contents on March 9, 1992.

The tank removal process was initiated on March 19, 1992 with the triple rinsing of the tanks. The rinseate was containerized in properly labeled 55 gallon barrels, and stored on the site awaiting proper disposal. Following the tank rinsing, the concrete cap overlying the tanks was demolished. During the tank excavation operation, gasoline saturated soil was encountered on the south side of the unleaded gasoline UST and free product began pooling shortly thereafter. TGI postponed excavation and the local fire marshals office was contacted. Upon arrival Dennis Hasley, Ann Arbor's Fire Marshal, instructed CET to soak up the small (approximately 5 to 10 gallons) puddle of free product with the overburden soil.

Free product was not observed to be re-pooling and the removal of concrete was resumed with the Fire Marshal's approval.

On March 20, 1992, removal of the overlying concrete was completed and excavation of the soil surrounding the UST began. Upon removal of the unleaded gasoline UST pooling product returned to the excavation and the local fire marshal was contacted (see Appendix F, page F-1). The fire marshal poured an emulsifier onto the pooling product, and granted permission to proceed with removal of the second UST, see Appendix F page F-1 for the tank disposal receipt. TGI then made arrangements to have the product and water pumped from the excavation. One hour and twenty minutes later Michigan Pumping Service began vacuum pumping the product and water. Pumping continued until product was not visible. Approximately 1200 gallons was pumped over a period of approximately one and one-half hours, see Appendix E page E-1 for disposal manifest. Product continued to reenter the excavation. It was then determined that a free product investigation should be immediately initiated. A total of ninety-six cubic yards (yd^3) of impacted soil were removed from the site and properly disposed of at the City of Ann Arbor Landfill, see Appendix G for the landfill receipts. Additionally, 24 yd^3 of concrete was transported to Belville, Michigan for crushing.

Over the weekend free product re-entered the excavation and additional product and water was pumped by K & D on Monday, March 23, 1992, see Appendix E page E-2 for the disposal manifest. Approximately 1100 gallons of product and water were pumped from the excavation. After the pumping, a sheen of product appeared on the water that re-entered the excavation. After completion of the pumping, removal of impacted and concrete was resumed. Throughout the course of the day 96 yd^3 of excavated soil and 168 yd^3 of concrete were removed, see Appendix G for landfill receipts.

Water samples were collected from the tank pit for waste characterization to arrange for proper disposal of the pit water at the City of Ann Arbor's waste water treatment plant. Samples were stored on ice in a cooler and submitted to Environmental Quality Laboratory (EQL) for analyses on March 24, 1992. Samples were analyzed for Benzene, Toluene, Ethylbenzene and Xylenes (BTEX). Laboratory results received on March 30, 1992 from samples taken on March 24, 1992 indicate total BTEX constituents of 58.9 parts per million (ppm). Laboratory reports for this sampling event can be found in Appendix D, page D-1.

1.5.2 Monitoring Well Construction

The extent of the free product at the site was investigated by placing three flush mount monitoring wells on April 27, 1992. The locations of the wells are illustrated in Figure 3, Appendix A, page A-3. The wells were placed near the areas where pooling free product was observed during the excavation process. The purpose of the well placement was to determine the depth to the water table and the thickness and extent of the free product.

The monitoring wells were placed by CET and supervised by the on-site TGI professional. Monitoring well MW-1 was constructed using a two-inch inside diameter galvanized steel casing with a five foot, #6 slot, stainless steel screen. Monitoring wells MW-2 and MW-3 were constructed of a two-inch inside diameter Polyvinylchloride (PVC) casing with a five foot, #10 slot, PVC screen. The screens for the wells were set so that at least one foot of the screen was above the surface of the water table. A #7 silica filter sand was placed from the bottom of the well screens to approximately one foot above each screen. All three wells were capped with a one foot thick bentonite pellet seal. The annular space for well MW-1 was backfilled with a mixture of portland cement and bentonite to within one and one-half feet of grade level. Natural cuttings were used to backfill the annular space of wells MW-2 and MW-3 to within one and one-half feet of grade level. The remaining annular space for all three wells was filled with concrete. The wells were finished with flush mount protective covers set in concrete. The well logs are contained in Appendix B. On the same day that the wells were placed, monitoring well MW-1 was developed using a grout pump. Monitoring wells MW-2 and MW-3 were not developed.

1.5.3 Measurement of Product Levels

The stratum of free product at the site was investigated on March 30, 1992 by visually inspecting the water surface in the three monitoring wells using a product thickness sampler designed by TGI. The sampler is comprised of a tube about 3 feet in length by one and one-half inches in diameter with a plug at the bottom attached to a rope. The plug is allowed to move freely at the bottom while attached to the rope enabling the user to open or close the tube at will. The sampler bottom, the end with the plug attached to the rope, is lowered to a level below the suspected product level in the monitoring well with the bottom of the tube unplugged. This allows the sample to be collected undisturbed. At the appropriate location in the well the plug is pulled up into the bottom of the tube. The sampler then is pulled out of the well and the result is an undisturbed sample indicating the thickness of the free product. The results of the March 30, 1992 observations are shown below.

Location	Product Thickness (inches)
Monitoring Well MW-1	approximately 33
Monitoring Well MW-2	Sheen
Monitoring Well MW-3	Sheen

Although monitoring well MW-1 contained approximately 33 inches of free product, it is believed that capillary action and the removal of overburdened pressures due to the open bore hole caused an elevated reading.

1.5.4 Free Product Removal System Design

From the results of the observed product levels in the monitoring wells, it was determined that the best position for free product recovery would be from the area located near monitoring well MW-1, (see Appendix A, page A-3). Monitoring well MW-1 had a significant amount of free product to justify the placement of a free product recovery well in the vicinity of MW-1.

On Monday, April 13, 1992 the excavation was backfilled and a free product recovery well was constructed from a 12-inch diameter, 10 foot long, #20 slot, PVC screen. Pea gravel was placed from the bottom of the well screen to within one and one-half foot of the grade surface. The remaining annular space was filled with concrete and finished with a flush mount protective cover set in concrete. The well is located approximately 8 feet west of monitoring well MW-1. Product recovery will be accomplished using an oil/water separating unit. The product will be collected for disposal, and the water effluent will be discharged into the city sanitary sewers per the city of Ann Arbor's Waste Water Treatment Plant guidelines. Monitoring well MW-1 will be used to monitor the system's recovery rates.

2.0 SITE INVESTIGATION WORK PLAN

2.1 Abatement Measures

Abatement measures conducted to date have been limited to the removal of the USTs, the proper disposal of 192 cubic yards of impacted soil, removal of free product by pumping the excavation pit and initial construction of a free product removal system.

2.2 Additional Investigation

An investigation will be conducted to ascertain the vertical and lateral extent of the impacted soil and ground water at the site. The investigation will consist of a preliminary hydrogeological investigation and a soil boring investigation. The following sections describe the methodology that will be used, upon MDNR approval, to define the extent of contamination at the site.

2.2.1 Hydrogeological Investigation

The hydrogeological investigation described below consists of the placement of three monitoring wells, soil sampling during the placement of the wells, surveying of the wells, measuring static water levels in the wells and sampling of the wells. Each task is described in detail in the following sections.

2.2.1.1 *Ground Water Monitoring Well Placement*

The first phase of this work plan will be a preliminary hydrogeological investigation. This phase of the work plan will be implemented by placing three monitoring wells on the site to establish ground water flow direction, gradient and quality. Monitoring well MW-1 placed on March 27, 1992 will be one of the three wells used for this investigation. The other two wells will be constructed in the same manner as monitoring well MW-1, outlined in section 1.5.2. The wells will be installed using a drill rig equipped with seven-inch outside diameter hollow stem augers. The wells will be constructed of two-inch inside diameter galvanized steel casing with a five foot, #7 slot, stainless steel screen. The screens will be set so that at least one foot of the screen is above the surface of the water table. A #7 silica filter sand will be placed from the bottom of the well screen to a minimum of one foot above the screen and will be capped with a one foot thick bentonite pellet seal. A mixture of portland cement and bentonite will be used to fill the annular space to within one and one-half feet of grade level. The remaining annular space will be filled with concrete. The wells will be finished with a flush mount steel cap set in concrete.

Augers, well construction materials and sampling equipment will be steam cleaned prior to each use to prevent cross contamination. The soil cuttings created from the placement of the monitoring wells will be containerized in 55 gallon barrels, properly labeled and stored on the subject site until transportation arrangements for proper disposal are made.

After placement, the monitoring wells will be developed according to industry standards. The purged water will be containerized in 55 gallon barrels, properly labeled and stored on the subject site until arrangements for proper disposal are made.

Upon obtaining closure of the site by the MDNR, the wells will be abandoned by filling them with concrete.

2.2.1.2 *Well Installation Soil Sampling and Analyses*

During placement of the monitoring wells continuous split spoon soil samples will be collected from two feet below grade to the soil/water interface located approximately six feet below grade. The samples will be field screened using an Organic Vapor Meter (OVM) equipped with a Photo-ionization Detector (PID). A maximum of two samples from each boring will be submitted to an analytical laboratory for analyses of BTEX, Poly Nuclear Aromatics (PNAs), and total Lead. The samples submitted for analyses will be those with the highest PID readings from each boring. In the event that all the soil samples collected from a particular boring obtain a reading of zero on the PID, then the soil sample collected from the capillary zone will be submitted for analyses. These analyses will be performed by methods outlined in the MDNR draft document "Recommended Parameters, Analytical Methods, and Detection Levels at Lust Sites", dated April, 1991.

Sterile sample jars supplied by the analytical lab will be used to containerize the sampled soil. Samples will be stored in a cooler for transportation to an analytical laboratory. All sampling equipment will be thoroughly cleaned between sampling events. Standard chain of custody procedures will be followed.

2.2.1.3 *Monitoring Well Sampling and Surveying*

The monitoring wells will be surveyed using a registered surveyor to determine spacial locations to the nearest 0.1 foot and top of casing elevations correlated with USGS benchmark datum to the nearest 0.01 foot.

The wells will be given seven to ten days to stabilize. After this stabilization period, static water levels will be measured for each well to the nearest 0.02 foot. Following the measurement of static water levels, a minimum of three well volumes of water will be purged prior to sampling. Water table data will be used to calculate ground water flow direction and gradient. Water samples will be collected from each well using a stainless steel hand bailer. The sampled water will be submitted for laboratory analyses of BTEX, PNAs and dissolved lead to determine ground water quality. These analyses will be performed by methods outlined in the MDNR draft document "Recommended Parameters, Analytical Methods, and Detection Levels at Lust Sites", dated April, 1991.

Sterile sample jars supplied by the analytical lab will be used to containerize the sampled water. Samples will be stored in a cooler for transportation to an analytical laboratory. All sampling equipment will be thoroughly cleaned between sampling events. Standard chain of custody procedures will be followed.

2.2.2 Soil Boring Investigation

2.2.2.1 *Plume Delineation*

The extent of the ground water and soil contamination will be determined in terms of location, constituents, and concentrations by ground water and soil sampling as well as on-site analysis. The extent of the hydrocarbon impacted resources will be delineated by tracking BTEX and PNA concentrations.

The sampling procedure will involve using a drill rig equipped with 4 1/4-inch inside diameter hollow stem augers and an on-site field laboratory specially equipped for analyses by Environmental Protection Agency (EPA) methods 8020 and 602 for BTEX and method 8310 for PNAs. The detection limits will be 10 parts per billion (ppb) for EPA method 8020, one ppb for EPA method 602, 300 ppb for soil samples analyzed by method 8310 and five ppb for ground water samples analyzed by method 8310. The field lab uses the same equipment and standard operating procedures found in analytical laboratories, allowing for immediate on-site analysis of samples.

The on-site analysis will be conducted by Environmental Quality Laboratories (EQL) of Sterling Heights, Michigan. The analytical work will be performed using a Varian gas chromatograph and a Varian high performance liquid chromatograph (HPLC). Concentration values will be permanently recorded on hard copy output. Standard quality assurance/quality control procedures will be followed including sample surrogate spiking, sample duplicates, method blanks and matrix spikes.

Soil samples will be collected during the investigation using a twenty-four inch split spoon sampling device. The soils will be sampled at two intervals; two to four feet below grade and four to six feet below grade. The samples will be field screened using a PID and the resulting concentration will be entered into a log book dedicated to the site. The soil sample with the highest PID reading from each boring will be submitted to the on-site laboratory. In the event that both soil samples produce a zero reading on the PID the sample collected from the capillary fringe (4-6 feet below grade) will be submitted for analyses. The soil samples will be containerized in sterile sample jars supplied by the analytical laboratory. The samples will be stored in a cooler for transportation to the on-site laboratory. Standard chain of custody procedures will be followed.

Ground water samples will be collected using a lead screened hollow-stem auger advanced into the aquifer 5 feet. The samples will be collected using a stainless steel bailer inserted down the auger "string" to the sampling interval. Prior to the collection of the ground water samples a minimum of two auger "string" volumes of water will be purged. The purge water will be containerized in properly labeled 55 gallon barrels and stored on the site until arrangements for disposal are made. The ground water samples will be containerized in sterile sample jars supplied by the on-site laboratory. The samples will be stored in a cooler for transportation to the on-site laboratory. Standard chain of custody procedures will be followed.

Sample locations will be chosen along transects across and along the hydraulic gradient as determined by the preliminary hydrogeologic investigation. Sampling will begin downgradient of the contaminant source area in a line running laterally across the plume until both sides of the plume are reached. After both sides of the plume are defined, a second transect will be made perpendicular to the previous transect down the center line of the plume. The transect will continue until the leading edge of the plume is reached. An additional lateral transect may be necessary to completely define the plume's leading edge.

The amount of spacing between holes along a transect will be based on sample analysis results and will be left to the discretion of the on-site TGI staff professional. The soil borings and soil and ground water sampling will continue until the plume has been adequately defined. Boring logs will be maintained to characterize the soil strata encountered during drilling.

After the plume has been adequately defined using the methodology described above, a soil boring will be conducted upgradient from the plume to determine the stratigraphy, thickness of the aquifer, the depth to the confining layer, and the thickness of the confining layer. The soil boring will be advanced a maximum of five feet into the confining layer to minimize the risk of aquifer cross contamination. Samples will not be collected during this boring.

2.2.2.2 *Plume Monitoring*

After the plume delineation has been completed, a monitoring well will be installed at the leading edge of the plume along the centerline. The ideal location for this well is outside the plume delineated in the field investigation. The purpose of this guardian well is to monitor the forward migration of the contaminant plume. Additional wells may need to be placed as determined by the on-site TGI staff professional. Potential locations include, a cluster well set downgradient from the plume (if multiple discrete zones of contamination are identified), lateral plume movement guardian wells, or wells to monitor zones of contamination from off site sources. The monitoring wells will be constructed as described

previously in the preliminary hydrogeologic investigation section 2.2.1. Well screen placement will be based on the results of the on-site analysis.

3.0 HYDROGEOLOGICAL/SOIL BORING INVESTIGATION REPORT

A written report detailing the investigation will be prepared. This report will summarize the results of the field work, analytical data and present recommend tions based on conclusions drawn from the data. Analytical laboratory reports, water table data, boring logs, well construction diagrams and a CAD map of the site will be included in the report.

4.0 PROJECT SCHEDULE

The following is a week by week schedule for work to be performed as described in this supplemental site investigation. This schedule will commence within two weeks of obtaining written approval of the work plan by the MDNR and is based on reasonable weather conditions within the period of performance. Adverse weather conditions may force a delay in the completion of any of the individual tasks presented herein.

WEEK	TASK
Week One	Schedule drill rig Call Ms. Dig
Week Two	Well placement and development
Week Three	Well surveying
Week Four	Well sampling
Week Six	Analytical results received and reviewed (assuming a 10 day turn around time for analyses)
Week Seven	Surveying results received and reviewed
Week Eight	Static water levels measured

WEEK	TASK
Week Nine	Determination of ground water flow direction
Week Ten	Soil Boring Investigation initiated and completed
Week Eleven	Analytical results reviewed and compiled
Week Twelve	Report initiated
Week Thirteen	Report reviewed
Week Fourteen	Report completed
Week Fifteen	Report submitted to MDNR

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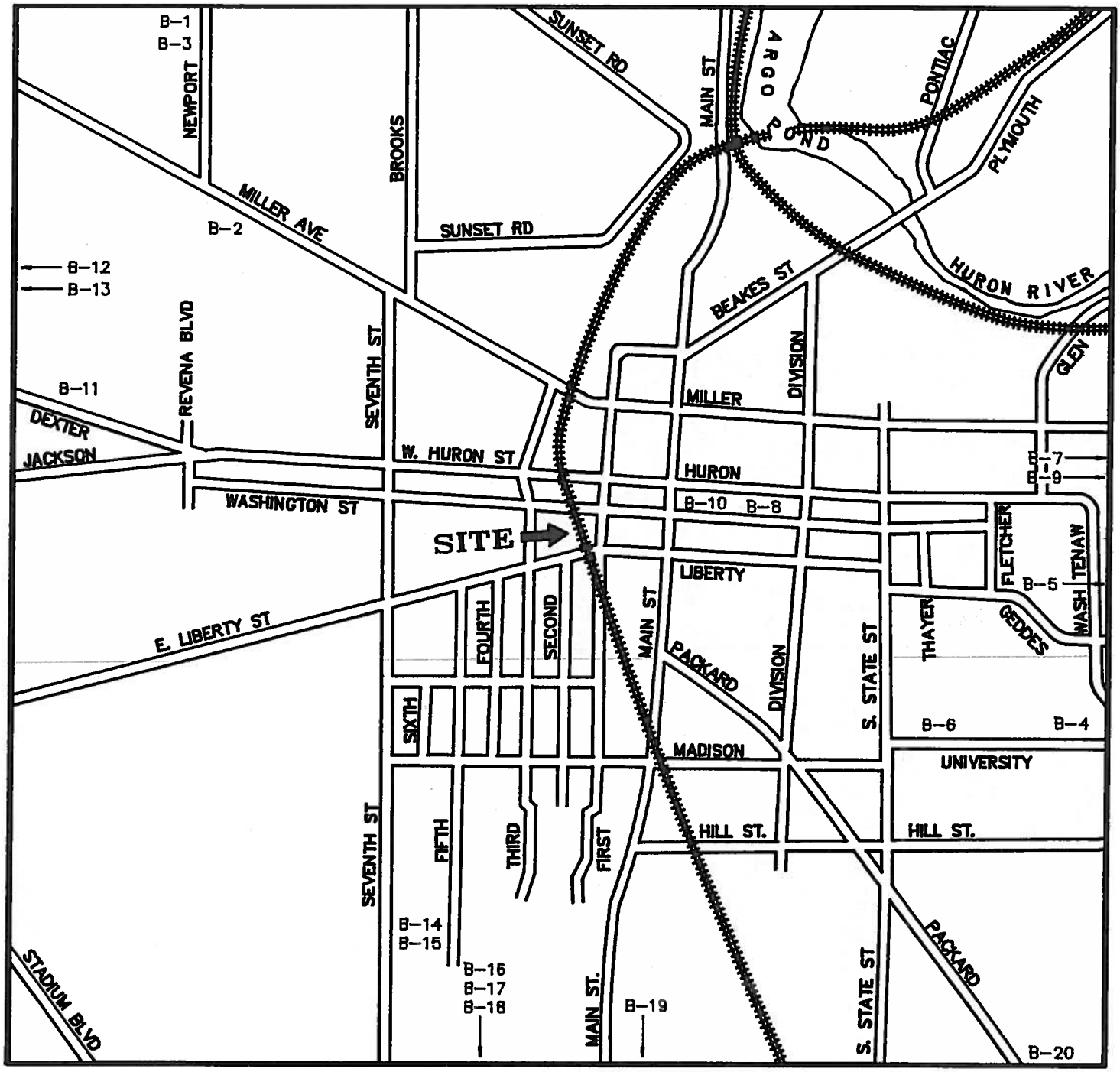
APPENDIX A: MAPS

DOCUMENT	PAGE
Figure 1. Well Log Site Sketch	A-1
Figure 2. Site Sketch	A-2
Figure 3. Site Sketch (Detail)	A-3
Figure 4. Utility Locations	A-4

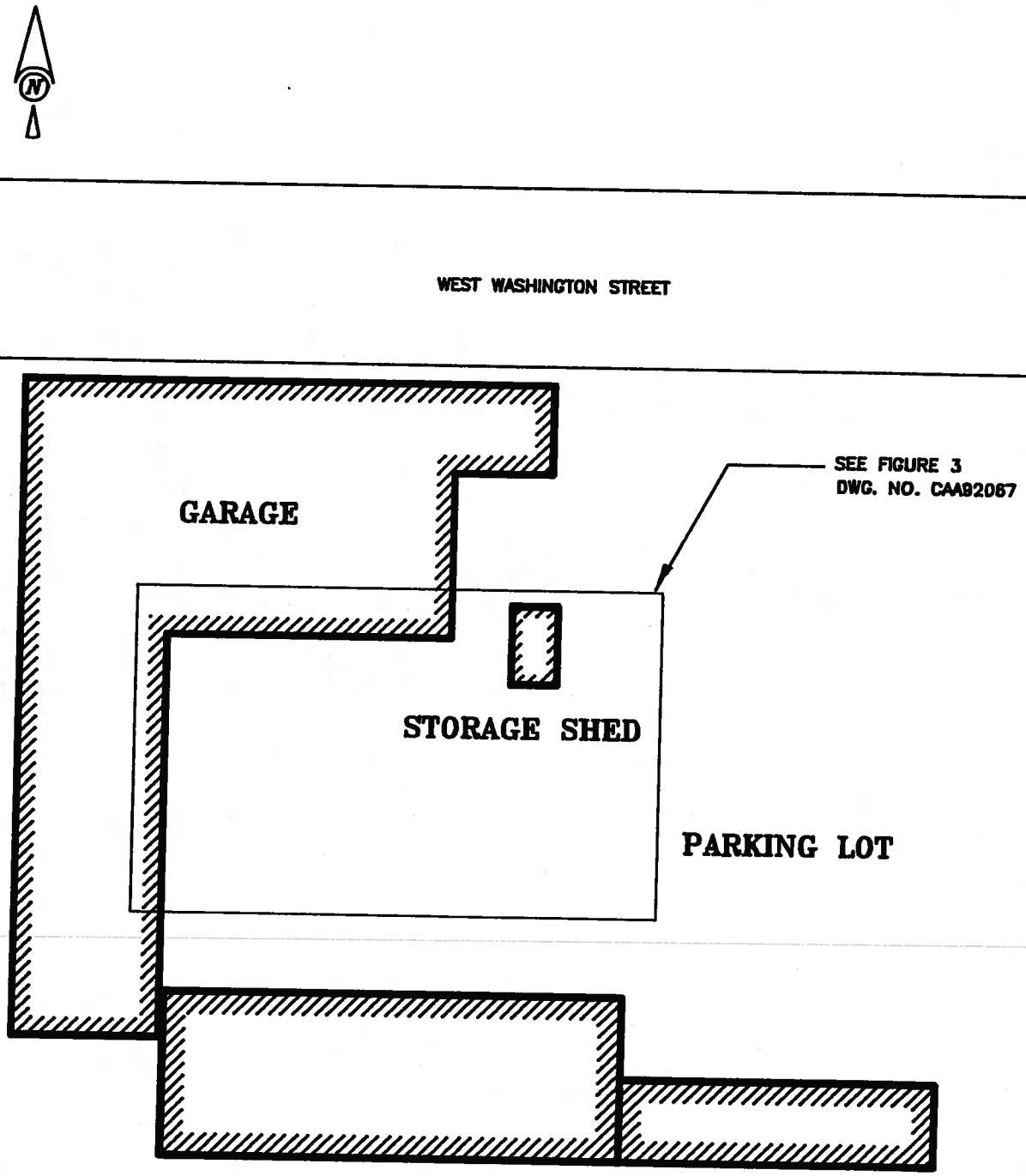
WELL LOG SITE SKETCH



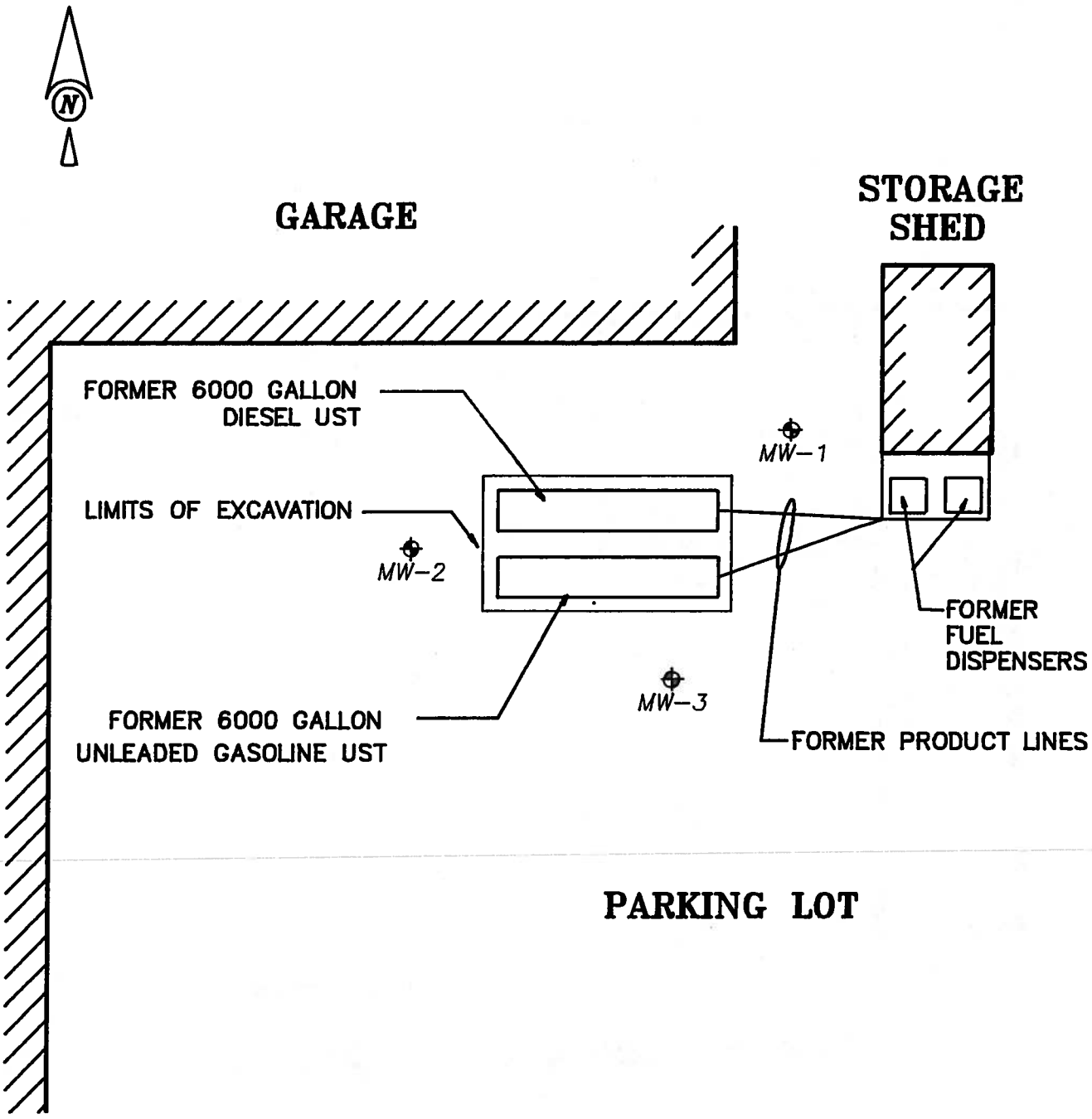
NOTE: 1.) WELL NAMES CORRESPOND TO APPENDIX PAGE NUMBERS.

2.) DRAWING IS FOR REFERENCE ONLY AND IS NEITHER COMPLETE, NOR TO EXACTING SCALE.

FIGURE 1



CLIENT CITY OF ANN ARBOR	The Traverse Group, Inc. 3772 Plaza Drive, Suite 5 Airport Plaza Park Ann Arbor, Michigan 48108	TITLE FIGURE 2 SITE SKETCH	
SITE PARKS AND RECREATION GARAGE			
LOCATION 415 W. WASHINGTON STREET ANN ARBOR, MICHIGAN 48103		DATE 04-16-92	ENGINEER EPH
		PROJECT 672B	DWG CAA92040
		SCALE 1" = 50'	DRAFTED BY: GH



LEGEND

⌖ *MONITORING WELL—MW*

CLIENT: CITY OF ANN ARBOR	The Traverse Group, Inc. 3772 Plaza Drive, Suite 5 Airport Plaza Park Ann Arbor, Michigan 48108	TITLE: FIGURE 3 DETAIL MONITORING WELLS	
SITE: PARKS AND RECREATION GARAGE			
LOCATION: 415 W. WASHINGTON STREET ANN ARBOR, MICHIGAN 48103		DATE: 04—16—92	ENGINEER: EPH
		PROJECT: 672B	DWG: CAAA92067
		SCALE: 1" = 20'	DRAFTED BY: GH

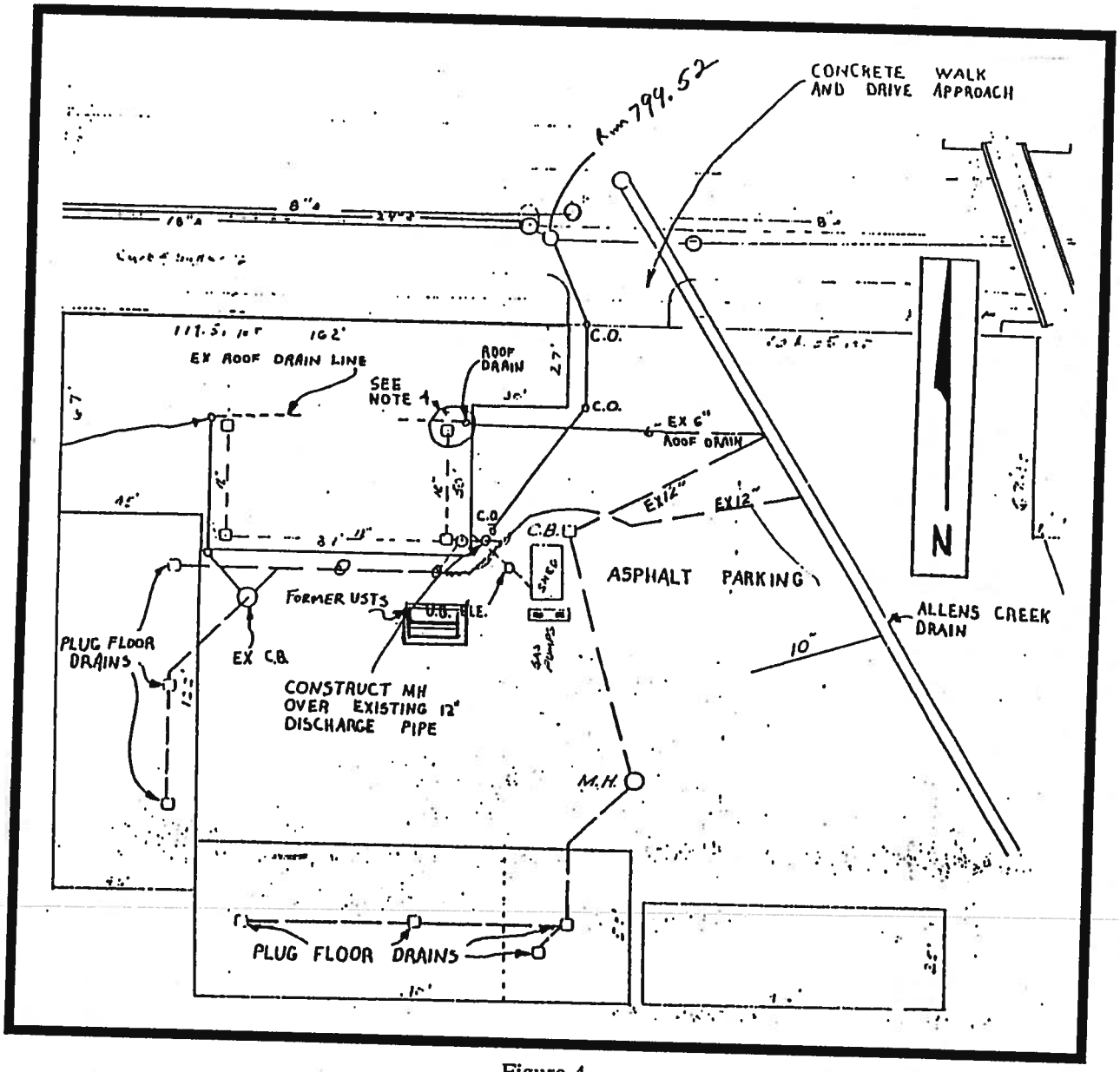


Figure 4
Utility Locations
(Copy obtained from Ann Arbor City Records)

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APPENDIX B: DOMESTIC WELL LOGS

DOCUMENT	PAGE
1585 Alexandra (03/22/75)	B-1
1645 Miller (09/29/77)	B-2
2024 Newport Rd. (01/19/83)	B-3
5861 Geddes Rd. (04/02/73)	B-4
350 Rock Creek Dr. (09/27/79)	B-5
809 N. University (06/02/80)	B-6
1090 Observatory (04/28/82)	B-7
5 Ridgemore (08/31/84)	B-8
190 Orchard Hill Ct. (10/07/87)	B-9
2 Ridgemore (10/16/80)	B-10
2340 Dexter (06/01/90)	B-11
1241 S. Maple (05/24/73)	B-12
1514 S. Maple (06/30/70)	B-13
639 Turner Park (11/05/70)	B-14
2055 Welch Ct. (07/09/76)	B-15
University Golf Course - Stadium Blvd. (10/30/89)	B-16
University Golf Course - Stadium Blvd. (10/30/89)	B-17
500 East Stadium (07/19/91)	B-18
500 East Stadium (07/22/91)	B-19
1565 Eastover (unknown)	B-20

B-

WATER WELL RECORD
ACT 294 . PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

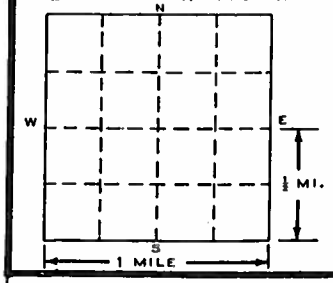
LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Washtenaw	Ann Arbor	NE ¼ NW ¼ NE ¼	19	2 N/S.	6 E/W.

Distance And Direction from Road Intersections: Apx 250' west of int Newport & Alexandra Then abt 150' south CL Alexandra. This is well #2

Street address & City of Well Location: ?1585 Alexandra

Locate with "X" in section below — Sketch Map:



3 OWNER OF WELL:
Jennings Newport Hgts Water Board
Address: 2143 Newport Rd. Ann Arbor

4 WELL DEPTH: (completed) 118' ft. Date of Completion: 3-22-75

5 [X] Cable tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Jetted [ ] Bored [ ] ____

6 USE: [ ] Domestic [X] Public Supply [ ] Industry [ ] Irrigation [ ] Air Conditioning [ ] Commercial [ ] Test Well [ ] ____

7 CASING: Threaded [X] Welded [ ]
4 in. to 112 ft. Depth
____ in. to ____ ft. Depth
Height: Above [illegible] Surface 1⅓ ft.
Weight 11 lbs./ft.
Drive Shoe? Yes [X] No [ ]

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Yellow clay	14	14
Blue clay & stones	78	92
Hard clay & sand	5	97
Fine sand (dirty)	5	102
Sand & gravel	13	115
Sand (medium)	1	116
Sand & gravel	3	119
Hardpan	??	??
Reference point: drilling		
platform abt 1' above gr.		
USE A 2ND SHEET IF NEEDED		

8 SCREEN:
Type: 304 SS slotted Dia.: 3.75 OD
Slot/Gauze 25 Length 6'
Set between 112 ft. and 118 ft.
Fittings: TBE Neoprene packer on 3x12 Nipple & Solid CI Plug

9 STATIC WATER LEVEL
74 ft. below land surface

10 PUMPING LEVEL below land surface
??? ft. after 4 hrs. pumping [illegible] 50 g.p.m rig
77⅓ ft. after 4 hrs. pumping 27 g.p.m pump

11 WATER QUALITY in Parts Per Million:
Iron (Fe) ____ Chlorides (Cl) ____
Hardness ____ Other ____

12 WELL HEAD COMPLETION: [ ] In Approved Pit [X] Pitless Adapter [ ] 12" Above Grade

13 Well Grouted? [X] Yes [ ] No
[X] Neat Cement [ ] Bentonite [ ] ____
Depth: From 5 ft. to 12 ft.

14 Nearest Source of possible contamination
None on property ____ Type
Well disinfected upon completion [X] Yes [ ] No

15 PUMP: [ ] Not installed
Manufacturer's Name Red Jacket
Model Number 200T1-13CC HP 2 Volts 230
Length of Drop Pipe 101 ft. capacity 27 G.P.M.
Type: [X] Submersible [ ] Jet [ ] Reciprocating

16 Remarks, elevation, source of data, etc.
Drilling site inspected & approved by Richard Sacks of MDPH. Actual drilling, screen installation, test pumping & pump installation observed by J. Curtis & R. Colburn of WCHD

17 WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
J. P. Schmitt & Co. (REGISTERED BUSINESS NAME) 0019 (REGISTRATION NO.)
Address 4540 Saline Rd. Ann Arbor
Signed [signature] (AUTHORIZED REPRESENTATIVE) Date 4-18-75

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

GEOLOGICAL SURVEY SAMPLE No. _____ B-

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

LOCATION OF WELL

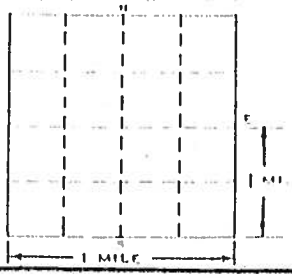
County	Township Name	Fraction	Section Number	Town Number	Range Number
Washtenaw	Ann Arbor	NU ¼ NW ¼ SE ¼	19	2 N/S.	5 E/W

Distance And Direction from Road Intersections

Street address & City of Well Location 1645 Miller

Locate with "X" in section below

Sketch Map:



3 OWNER OF WELL:

Address: Lucille Gilbert, 11 Mile E Shore Dr, Whitmore Lake

4 WELL DEPTH: (completed) 307 ft. Date of Completion 9-29-77

5 ☐ Cable tool ☑ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE: ☑ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ____

7 CASING: Threaded ☐ Welded ☐ Diam. ____ in. to ____ ft. Depth ____ in. to ____ ft. Depth

Height: Above/Below Surface ____ ft. Weight ____ lbs./ft. Drive Shoe? Yes ☐ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
yellow clay	8	8
yellow sand & gravel	25	33
hard blue clay	72	105
sand blue clay & gravel	45	150
blue clay sand	60	210
hard blue clay	24	234
soft blue shale	73	307
called hole dry		
plugged w/bentonite		
and cuttings		

USE A 2ND SHEET IF NEEDED

8 SCREEN:

Type: ____ Dia.: ____

Slot/Gauze ____ Length ____

Set between ____ ft. and ____ ft.

Fittings:

9 STATIC WATER LEVEL

____ ft. below land surface

10 PUMPING LEVEL below land surface

____ ft. after ____ hrs. pumping ____ g.p.m.

____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) ____ Chlorides (Cl) ____

Hardness ____ Other ____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☐ ____

Depth: From ____ ft. to ____ ft.

14 Nearest Source of possible contamination

____ feet ____ Direction ____ Type

Well disinfected upon completion ☐ Yes ☐ No

15 PUMP: ☐ Not installed

Manufacturer's Name ____

Model Number ____ HP ____ Volts ____

Length of Drop Pipe ____ ft. capacity ____ G.P.M.

Type: ☐ Submersible ☐ Jet ☐ Reciprocating

Remarks, elevation, source of data, etc.

Replacement Well

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Stasser Drilling Co., Inc. [illegible]

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 1761 W Michigan Ypsilanti

Signed [signature] Date [illegible]

AUTHORIZED REPRESENTATIVE

067d 100M (Rev. 12-68)

GEOLOGICAL SURVEY NO.

WATER WELL AND PUMP RECORD

PART 127 ACT 368, P.A. 1978

PERMIT NUMBER B-

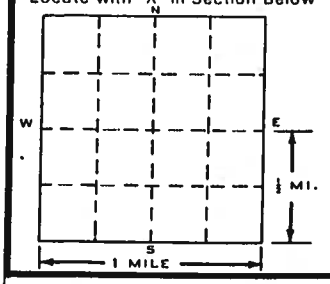
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
WASHTENAW	ANN ARBOR	¼ ¼ ¼	19	N/S	E/W

Distance And Direction From Road Intersection

Street Address & City of Well Location

Locate with "X" in Section Below



Sketch Map

3 OWNER OF WELL

Name: EGBERT BIRCHMEIER

Address: 2024 NEWPORT RD ANN ARBOR MI

Address Same As Well Location? ☒ Yes ☐ No

4 WELL DEPTH (completed) 151 ft. **Date of Completion** 1-17-83

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ _____

6 USE ☒ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐ _____

7 CASING Diameter ☐ Steel ☐ Threaded ☒ Plastic ☐ Welded

5 in. to 151 ft. depth

_____ in. to _____ ft. depth

Grouted Drill Hole Diameter

_____ in. to _____ ft. depth

_____ in. to _____ ft. depth

Height Above/Below Surface 1 ft.

Weight _____ lbs./ft.

Drive Shoe ☐ Yes ☒ No

8 SCREEN ☐ Not installed

Type WN STAINLESS 4"-30 SLOT Diameter 4" NOM

Slot/Gauge 4"-30 BOTTOM Length 8

Set between 143 ft. and 151 ft.

FITTINGS ☒ K-Packer ☐ Lead Packer ☐ Bremer Check

☒ Blank above screen 1 ft. Other _____

9 STATIC WATER LEVEL 104 ft. below land surface ☐ Flow

10 PUMPING LEVEL below land surface

104 ft. after 2 hrs. pumping at 9 GPM

_____ ft. after _____ hrs. pumping at _____ GPM

11 WELL HEAD COMPLETION ☒ Pitless adapter ☐ 12" above grade ☐ Basement offset ☐ Approved pit

12 WELL GROUTED? ☐ No ☒ Yes From 0 to 151 ft.

☐ Neat cement ☒ Bentonite ☐ Other _____

No. of bags of cement _____ Additives _____

13 Nearest source of possible contamination

Type _____ Distance _____ ft. Direction _____

Well disinfected upon completion? ☐ Yes ☐ No

14 PUMP ☐ Not Installed ☐ Pump Installation Only

Manufacturer's name _____

Model number _____ HP _____ Volts _____

Length of Drop Pipe 130 ft. Capacity 9 GPM

TYPE ☐ Submersible ☐ Jet _____

PRESSURE TANK

Manufacturer's name _____

Model number _____ Capacity _____ Gallons

2 FORMATION DESCRIPTION

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN CLAY	17	17
GRAY CLAY	9	26
YELLOW CLAY	11	37
SAND	39	76
GRAY CLAY	13	89
BOULDER	1	90
ROCKS & GRAY CLAY	3	93
GRAY CLAY	42	135
GRAY CLAY & GRAVEL	5	140
GRAVEL	11	151

USE A 2ND SHEET IF NEEDED

15. Remarks, elevation, source of data, etc.

AA-1-83-WR

16. WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

CRIGLER DRILLING CO INC 81-286

REGISTERED BUSINESS NAME REGISTRATION NO.

Address DEXTER MI 48130

Signed Charles Crews Date 1-28-83

AUTHORIZED REPRESENTATIVE

D67d (Rev 10-80)

GEOLOGICAL SURVEY SAMPLE No. [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] B-4

WATER WELL RECORD
ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

LOCATION OF WELL

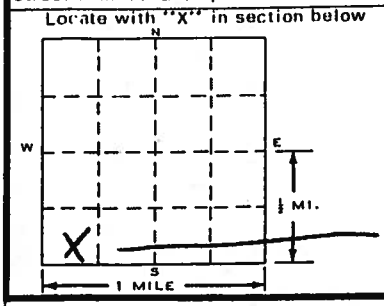
County	Township Name	Fraction	Section Number	Town Number	Range Number
Washtenaw	Ann Arbor	¼ ¼ ¼	28	2 N/S.	6 E/W.

Distance And Direction from Road Intersections
3/4 mi. E. of US-23, 1/8 mi. W. of Arlington, on N. side of Geddes

Street address & City of Well Location 5861 Geddes Rd.

Locate with "X" in section below

Sketch Map:



3 OWNER OF WELL:
Tom Vreeland
Address 5861 Geddes Rd.
Ann Arbor, Mich.

4 WELL DEPTH: (completed) 74 ft. Date of Completion April 2-73

5 [ ] Cable tool [X] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Jetted [ ] Bored [ ] ____

6 USE: [X] Domestic [ ] Public Supply [ ] Industry
[ ] Irrigation [ ] Air Conditioning [ ] Commercial
[ ] Test Well [ ] ____

7 CASING: Threaded [X] Welded [ ] Height: Above/Below Surface ____ ft.
Diam. 4 in. to 69 ft. Depth Weight 11 lbs./ft.
____ in. to ____ ft. Depth Drive Shoe? Yes [X] No [ ]

8 SCREEN:
Type: JOHNSON Dia.: 3"
Slot/Gauze 15 Length 4
Set between 69 ft. and 73 ft.
Fittings: NEOP. SEAL

9 STATIC WATER LEVEL
42 ft. below land surface

10 PUMPING LEVEL below land surface
50 ft. after 2 hrs. pumping 10 g.p.m.
____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million:
Iron (Fe) ____ Chlorides (Cl) ____
NONE
Hardness ____ Other ____

12 WELL HEAD COMPLETION: [ ] In Approved Pit
[X] Pitless Adapter [ ] 12" Above Grade

13 Well Grouted? [X] Yes [ ] No
[ ] Neat Cement [X] Bentonite [ ] ____
Depth: From 69 ft. to SURFACE ft.

14 Nearest Source of possible contamination
100+ feet N Direction SEPTIC Type
Well disinfected upon completion [X] Yes [ ] No

15 PUMP: [ ] Not installed
Manufacturer's Name WEBER
Model Number ____ HP ½ Volts 220
Length of Drop Pipe 60 ft. capacity 5 G.P.M.
Type: [X] Submersible
[ ] Jet [ ] Reciprocating

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
CLAY	15	15
SAND	54	69
SAND GRAVEL	5	74

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

Replacement Well

17 WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Gordon & Son — 0551
REGISTERED BUSINESS NAME — REGISTRATION NO.

Address Petersburg Mich

Signed Butch Gordon — Date April 9-73
AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

GEOLOGICAL SURVEY SAMPLE No. [ ]

B-5

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

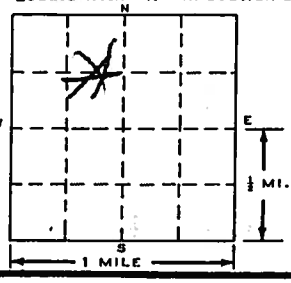
LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
WASHTENAW	ANN ARBOR	¼ ¼ ¼	28	2 N/S.	6 E/W.

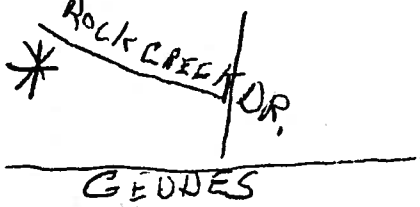
Distance And Direction from Road Intersections: 1/4 MILE N.W. OF GEDDES ON ROCK CREEK 350

Street address & City of Well Location

Locate with "X" in section below



Sketch Map:



3 OWNER OF WELL:
Address: Ray Gilbert 276 ELMHURST YPS.

4 WELL DEPTH: (completed) 85 ft. Date of Completion 9/27/79

5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ____

7 CASING: Threaded ☒ Welded ☐ Height: Above/Below Surface 1 ft.
4 in. to all ft. Depth; Weight 11 lbs./ft.
____ in. to ____ ft. Depth; Drive Shoe? Yes ☒ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
CLAY	#38	38
MUD	2	40
CLAY	42	82
WATER SAND	3	85

8 SCREEN:
Type: Johnson S.S. Dia.: 4
Slot 25 Length 4
Set between 81 ft. and 85 ft.
Fittings: 3" plug & K-Packer

9 STATIC WATER LEVEL
41 ft. below land surface

10 PUMPING LEVEL below land surface
53 ft. after 2 hrs. pumping 12 g.p.m.
54 ft. after 2 hrs. pumping 12 g.p.m.

11 WATER QUALITY in Parts Per Million:
Iron (Fe) ____ Chlorides (Cl) NOT KNOWN
Hardness ____ Other ____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☒ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☒ mud
Depth: From ____ ft. to ____ ft.

14 Nearest Source of possible contamination
____ feet ____ Direction SEPTIC TANK Type
Well disinfected upon completion ☒ Yes ☐ No

15 PUMP: ☐ Not installed
Manufacturer's Name RED JACKET
Model Number 50 bc HP ½ Volts 230
Length of Drop Pipe 70 ft. capacity ____ G.P.M.
Type: ☒ Submersible ☐ Jet ☐ Reciprocating

USE A 2ND SHEET IF NEEDED

Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Ann Arbor Well Drilling, Inc. 1290
REGISTERED BUSINESS NAME REGISTRATION NO.
Address 7015 Joy Rd. Dexter, Mich. 48130
Signed GERALD F. WHEELER 1 Date 10/30/79
AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

GEOLOGICAL SURVEY SAMPLE No. [ ]

B-6

WATER WELL RECORD
ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

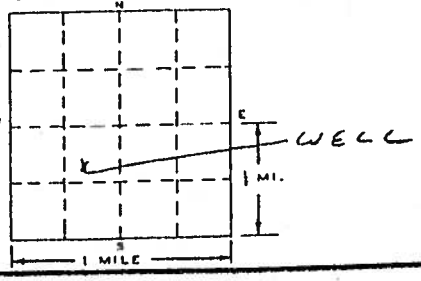
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
WASHTENAW	ANN ARBOR	¼ ¼ ¼	28	2 S.	6 W.

Distance And Direction from Road Intersections: 809 N UNIVERSITY

Street address & City of Well Location: ANN ARBOR

Locate with "X" in section below — Sketch Map:



3 OWNER OF WELL: UOM

Address: ANN ARBOR MICH

4 WELL DEPTH: (completed) 96 ft. Date of Completion 6-2-80

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☑ Jetted ☐ Bored ☐ ____

6 USE: ☐ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☒ RESEARCH

7 CASING: Threaded ☒ Welded ☐ Diam. 4 in. to 89 ft. Depth; ____ in. to ____ ft. Depth. Height: Above/~~Below~~ Surface 1 ft. Weight 11 lbs./ft. Drive Shoe? Yes ☒ No ☐

8 SCREEN: Type: WW STAINLESS Dia.: 3¾ Slot/~~Gauge~~ 25 Length 4 Set between 89 ft. and 93 ft. Fittings: PACKER + 3' BLANK

9 STATIC WATER LEVEL: 80 ft. below land surface

10 PUMPING LEVEL below land surface: 80 ft. after 2 hrs. pumping 12 g.p.m.; ____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million: Iron (Fe) ____ Chlorides (Cl) ____ Hardness ____ Other ____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☒ Bentonite ☐ ____ Depth: From ____ ft. to ____ ft.

14 Nearest Source of possible contamination: ____ feet ____ Direction ____ Type ____ Well disinfected upon completion ☒ Yes ☐ No

15 PUMP: ☐ Not installed. Manufacturer's Name RED JACKET. Model Number SOLID-CORE HP ½ Volts 230. Length of Drop Pipe 84 ft. capacity 12 G.P.M. Type: ☒ Submersible ☐ Jet ☐ Reciprocating

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
GRAVEL	93	93
CLAY	3	96

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

CRISLEY DRILLING CO — REGISTERED BUSINESS NAME — 81-1586 REGISTRATION NO

Address: DEXTER MICH

Signed: Charles Crisler — AUTHORIZED REPRESENTATIVE — Date 6-6-80

WCR (Rev. 12-68)

B-

GEOLOGICAL SURVEY NO

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

WATER WELL AND PUMP RECORD

PART 127 ACT 368 P.A. 1978

PERMIT NUMBER

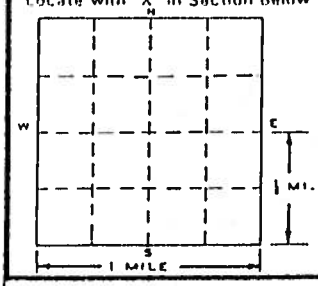
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Wash	Ann Arbor	¼ ¼ ¼	28	2 N/S	6 E/W

Distance And Direction From Road Intersection
1090 Observatory
Ann Arbor, Mi. 48109

Street Address & City of Well Location

Locate with "X" in Section Below — Sketch Map



3 OWNER OF WELL University of Michigan
Address 326 Hoover St. Ann Arbor Mi. 481[illegible]
Address Same As Well Location? ☐ Yes ☒ No

4 WELL DEPTH (completed) 193 ft. — Date of Completion 4-28-82

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

6 USE ☐ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☒ SCIENCE Study

7 CASING Diameter ☐ Steel ☐ Threaded ☒ Plastic ☐ Welded
5 in. to 193 ft. depth
____ in. to ____ ft. depth
Grouted Drill Hole Diameter
2 7/8 in. to 180 ft. depth
____ in. to ____ ft. depth
Height: Above/Below Surface 1 ft.
Weight SDR 21 lbs/ft
Drive Shoe ☐ Yes ☒ No

8 SCREEN ☐ Not Installed
Type WW STAIN Diameter 4" Nom
Slot/Gauze 16-18 Length 8
Set between 185 ft. and 193 ft.
FITTINGS ☒ K-Packer ☐ Lead Packer ☐ Bremer Check
☒ Blank above screen 1 ft. Other ____

9 STATIC WATER LEVEL
112 ft. below land surface ☐ Flow

10 PUMPING LEVEL below land surface
112 ft. after 2 hrs. pumping at 20 G.P.M.
____ ft. after ____ hrs. pumping at ____ G.P.M.

11 WELL HEAD COMPLETION ☒ Pitless adapter ☐ 12" above grade ☐ Basement offset ☐ Approved pit

12 WELL GROUTED? ☐ No ☒ Yes From ____ to ____ ft.
☐ Neat cement ☒ Bentonite ☐ Other ____
No. of bags of cement ____ Additives ____

13 Nearest source of possible contamination
City Sewer System
Type ____ Distance ____ ft. Direction ____
Well disinfected upon completion? ☒ Yes ☐ No

14 PUMP ☐ Not Installed ☐ Pump Installation Only
Manufacturer's name Red Jacket
Model number CN10GC HP 1½ Volts 220
Length of Drop Pipe 120 ft. capacity 17 G.P.M.
TYPE: ☒ Submersible ☐ Jet ____
PRESSURE TANK
Manufacturer's name CLAYTON MARK
Model number 220-05 Capacity 34 Gallons

2 FORMATION DESCRIPTION

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN CLAY	11	11
GRAVEL & ROCKS	5	16
SAND & GRAVEL	21	37
VOID	4	41
GRAVEL	8	49
GRAY CLAY & GRAVEL	33	82
YELLOW CLAY	17	99
SOFT GRAY CLAY	66	165
SAND	10	175
FINE GRAVEL	18	193

USE A 2ND SHEET IF NEEDED

EMMONS

15. Remarks, elevation, source of data, etc.
16 SLOT SCREEN TOP
18 " " BOTTOM
DL

16. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Earth Lee Drilling Co Inc 81-0524
REGISTERED BUSINESS NAME — REGISTRATION NO.
Address Dexter Mi. 48130
Signed [signature] Date 1-18-82
AUTHORIZED REPRESENTATIVE

D878 (Rev. 10-80)

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

WATER WELL AND PUMP RECORD

PART 127 ACT 368, P.A. 1978

GEOLOGICAL SURVEY NO

PERMIT NUMBER B-

1 LOCATION OF WELL

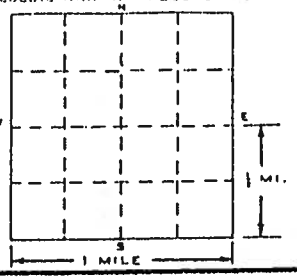
County	Township Name	Fraction	Section Number	Town Number	Range Number
Washtenaw	Ann Arbor	1/4 1/4 ne 1/4	29	2 N/S	6 E/W

Distance And Direction From Road Intersection
US 23 to Ann Arbor Exit Main St.
Right on Liberty to left on Ridgemore, 1st house.

Street Address & City of Well Location

Locate with "X" in Section Below

Sketch Map



3 OWNER OF WELL
Doris K. Snyder
5 Ridgemore
Address Ann Arbor, Mi 48103

Address Same As Well Location? [X] Yes [ ] No

4 WELL DEPTH (completed) 112 ft

Date of Completion Aug 31, 1984

5 [ ] Cable tool [X] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger [ ] Jetted [ ]

6 USE [X] Domestic [ ] Type I Public [ ] Type III Public [ ] Irrigation [ ] Type IIa Public [ ] Heat pump [ ] Test Well [ ] Type IIb Public [ ]

7 CASING Diameter [X] Steel [ ] Threaded [ ] Plastic [ ] Welded
4 in. to 108 ft. depth
in. to ft. depth
Grouted Drill Hole Diameter
in. to ft. depth
in. to ft. depth

Height Above/Below Surface ft
Weight 11 lbs/ft
Drive Shoe [X] Yes [ ] No

2 FORMATION DESCRIPTION

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Yellow Clay	10	10
Brown Clay	9	19
Sand Gravel	35	54
Clay	35	89
Water Bearing Gravel	24	112

USE A 2ND SHEET IF NEEDED

8 SCREEN Johnson [ ] Not Installed
Type s/s w/w Diameter 4"
Slot/~~Gauze~~ 20 Length 4'
Set between 108 ft and 112 ft
FITTINGS: [X] K-Packer [ ] Lead Packer [ ] Bremer Check
[X] Blank above screen ft Other

9 STATIC WATER LEVEL
63' ft. below land surface [ ] Flow

10 PUMPING LEVEL below land surface
85 ft. after 1 hrs pumping at 20+ GPM
ft. after hrs pumping at GPM

11 WELL HEAD COMPLETION: [X] Pitless adapter [ ] 12" above grade [ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [ ] No [X] Yes From to ft
[X] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement Additives

13 Nearest source of possible contamination
Type Septic Distance 100 ft Direction
Well disinfected upon completion? [X] Yes [ ] No

14 PUMP [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name Goulds
Model number 18E507 HP 3/4 Volts 230
Length of Drop Pipe 80 ft. capacity 24 GPM
TYPE: [X] Submersible [ ] Jet
PRESSURE TANK:
Manufacturer's name WX-203 Well-Trol
Model number WX-203 Capacity Gallons

15. Remarks, elevation, source of data, etc.

AA 14-84WR

16. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

Brown Drilling Co., Inc. 0026
REGISTERED BUSINESS NAME REGISTRATION NO.

Address Howell

Signed Harry R Brown Date
AUTHORIZED REPRESENTATIVE

D67d (Rev 10-80)

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

WATER WELL AND PUMP RECORD

PERMIT NUMBER

B-

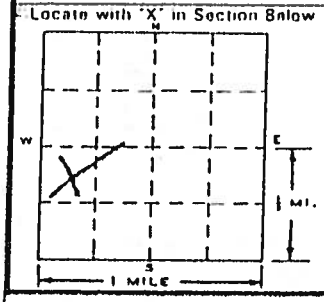
LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Washtenaw	Ann Arbor	¼ ¼ ¼	29	2 N/S	6 E/W

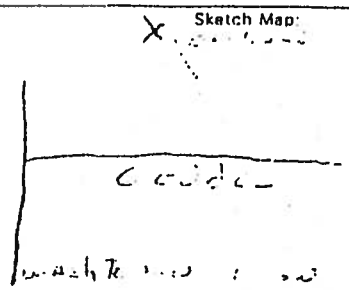
Distance And Direction From Road Intersection

Street Address & City of Well Location

Locate with "X" in Section Below



Sketch Map:



3 OWNER OF WELL: Paul Lawrence

Address: 190 Orchard Hill Ct, Ann Arbor 48104

Address Same As Well Location? [X] Yes [ ] No

4 WELL DEPTH: 152 FT. Date Completed: MO. 10 DAY 7 YEAR 87 [X] New Well [ ] Replacement Well

5 [ ] Cable tool [X] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger [ ] Jetted [ ]

6 USE: [X] Domestic [ ] Type I Public [ ] Type III Public [ ] Irrigation [ ] Type IIa Public [ ] Heat pump [ ] Test Well [ ] Type IIb Public [ ]

7 CASING: Diameter [ ] Steel [ ] Threaded [X] Plastic [ ] Welded

5 in. to 144 ft. depth

4 in. to 152 ft. depth

Grouted Drill Hole Diameter

7/25 in. to 144 ft. depth

in. to ft. depth

Height: Above/Below Surface 1 ft.

Weight lbs./ft.

Drive Shoe [ ] Yes [X] No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Brown Sandy Clay	50	50
Gray Sandy Clay	68	118
Gray Clay	16	134
Fine Sand	10	144
Course Sand	8	152

USE A 2ND SHEET IF NEEDED

8 SCREEN: [ ] Not Installed

Type Stainless Diameter 4 nominal

Slot/~~Gauze~~ 20-25 Length 8

Set between 144 ft. and 152 ft.

FITTINGS: [X] K-Packer [ ] Lead Packer [ ] Bremer Check

[ ] Blank above screen 1 ft. Other

9 STATIC WATER LEVEL: 66 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface

66 ft. after 2 hrs. pumping at 12 G.P.M.

ft. after hrs. pumping at G.P.M.

11 WELL HEAD COMPLETION: [X] Pitless adapter [ ] 12" above grade [ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [ ] No [X] Yes From to ft.

[ ] Neat cement [X] Bentonite [X] Other Drugs

No. of bags of cement Additives

13 Nearest source of possible contamination

Type City Sewer 20 Distance Direction

Well disinfected upon completion? [X] Yes [ ] No

Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only

Manufacturer's name Red Jacket

Model number [illegible] HP 3/4 Volts 220

Length of Drop Pipe 85 ft. capacity 18 G.P.M.

TYPE: [X] Submersible [ ] Jet

PRESSURE TANK:

Manufacturer's name X-Trol

Model number [illegible] Capacity [illegible] Gallons

15. Remarks, elevation, source of data, etc.

17. Rig Operator's Name: AA 19-87 WN

16. WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Gridley Drilling Co. Inc. 1872

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 8300 Dexter Chelsea Rd

Signed [illegible] Date 10-20-87

AUTHORIZED REPRESENTATIVE

D67d 12/85

Authority: Act 368 PA 1978

Completion: Required

GEOLOGICAL SURVEY SAMPLE No. [ ]

B-1

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

LOCATION OF WELL

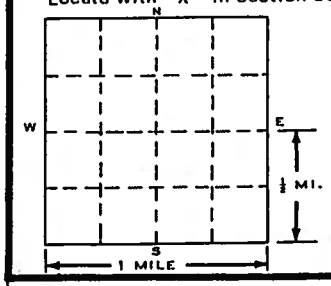
County	Township Name	Fraction	Section Number	Town Number	Range Number
Washtenaw	Ann Arbor	¼ ¼ ¼	30	N/S.	E/W.

Distance And Direction from Road Intersections

Street address & City of Well Location 2 Ridgemor

Locate with "X" in section below

Sketch Map:



3 OWNER OF WELL: David & Kelly Ross

Address 2 Ridgemor Dr. Ann Arbor

4 WELL DEPTH: (completed) 135 ft. Date of Completion 10

5 ☐ Cable tool ☑ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE: ☑ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ____

7 CASING: Threaded ☑ Welded ☐ Diam. 4 in. to 127 ft. Depth ____ in. to ____ ft. Depth

Height: Above/Below Surface ____ ft. Weight 11 lbs./ft. Drive Shoe? Yes ☑ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
yellow clay	14	14
hard blue clay	51	65
soft blue clay	25	90
ard blue clay	30	120
fine sand & gravel	15	135

USE A 2ND SHEET IF NEEDED

8 SCREEN:

Type: stainless Dia.: 4"

Slot/Gauze 10 Length 8

Set between 127 ft. and 135 ft.

Fittings: hemp packer plug 1ft blank

9 STATIC WATER LEVEL 60 ft. below land surface

10 PUMPING LEVEL below land surface 105 ft. after 2 hrs. pumping 20 g.p.m.

____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) ____ Chlorides (Cl) ____

Hardness ____ Other ____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☑ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☑ Yes ☐ No ☐ Neat Cement ☑ Bentonite ☐ ____

Depth: From ____ ft. to ____ ft.

14 Nearest Source of possible contamination 110 feet E Direction drainfield Type

Well disinfected upon completion ☑ Yes ☐ No

15 PUMP: ☐ Not installed

Manufacturer's Name Hermotor

Model Number SD-20 HP 1 Volts 230

Length of Drop Pipe 105 ft. capacity ____ G.P.M.

Type: ☑ Submersible ☐ Jet ☐ Reciprocating

Remarks, elevation, source of data, etc.

replacement well

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Slusser Drilling Co, Inc 81-0388/1760

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 1701 W Michigan, Ypsilanti

Signed Paul Slusser Date 10-16-80

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

GEOLOGICAL SURVEY NO.

WATER WELL AND PUMP RECORD

PERMIT NUMBER 7 1 0 0 4 4 7 B-1

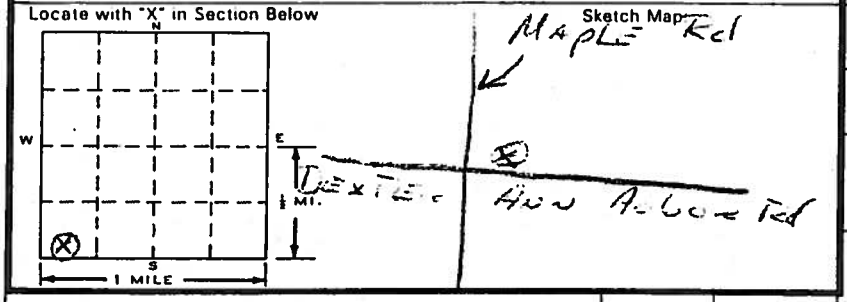
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
WASHTENAW	ANN ARBOR	S(W1/4 S(W1/4 S(E1/4	30	2 N/S	6 E/W

Distance And Direction From Road Intersection
2340 DEXTER-ANN ARBOR Rd
ANN ARBOR, MI. 48103

Street Address & City of Well Location

Locate with "X" in Section Below



Sketch Map

3 OWNER OF WELL: OK AUTO SERVICE

Address

Address Same As Well Location? ☒ Yes ☐ No

4 WELL DEPTH: 64 FT.

Date Completed MO. 6 DAY 1 YEAR 90

☐ New Well ☒ Replacement Well

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

6 USE: ☒ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐ ____

7 CASING: Diameter ☐ Steel ☐ Threaded ☒ Plastic ☐ Welded

5 in. to 58 ft. depth

____ in. to ____ ft. depth

Grouted Drill Hole Diameter

8 in. to 40 ft. depth

____ in. to ____ ft. depth

Height: Above/Below

Surface 1 ft.

Weight SDR 21 lbs./ft.

Drive Shoe ☐ Yes ☒ No

8 SCREEN: ☐ Not Installed

Type STAINLESS WW Diameter 5" Nom.

Slot/Gauge 20 Length 4'

Set between 58.5 ft. and 62.5 ft.

FITTINGS: ☒ K-Packer ☐ Lead Packer ☐ Bremer Check ☒ Blank above screen ____ ft. Other ____

9 STATIC WATER LEVEL: 46 ft. below land surface ☐ Flow

10 PUMPING LEVEL: below land surface

47 ft. after 2 hrs. pumping at 15 G.P.M.

____ ft. after ____ hrs. pumping at ____ G.P.M.

11 WELL HEAD COMPLETION: ☒ Pitless adapter ☐ 12" above grade ☐ Basement offset ☐ Approved pit

12 WELL GROUTED? ☐ No ☒ Yes From 0 to 40 ft.

☐ Neat cement ☐ Bentonite ☐ Other ____

No. of bags of cement ____ Additives ____

13 Nearest source of possible contamination

Type SEPTIC Distance 100 ft. Direction NW

Well disinfected upon completion? ☒ Yes ☐ No

Was old well plugged? ☒ Yes ☐ No

14 PUMP: ☐ Not Installed ☐ Pump Installation Only

Manufacturer's name AMT SIMLET

Model number 3J75C HP 1/2 Volts 115

Length of Drop Pipe 60 ft. capacity 15 G.P.M.

TYPE: ☒ Submersible ☐ Jet ____

PRESSURE TANK:

Manufacturer's name AMTROL

Model number WX-202 Capacity 62 Gallons

2 FORMATION DESCRIPTION

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
GRAVEL	3	3
GRAY CLAY	38	41
GRAVEL	22	63
GRAY CLAY	1	64

old #13 ✓
documentation of old well abandonment
Section # on permit = 30
" " well log = 19 changed to 30
NO
Section " " well log
" address - on well log
Difference
owner permit
Little protection below 30 ft. Condition Sheet
No record of inspection
NO

RECEIVED
AUG 27 1990
ENVIRONMENTAL HEALTH
10/10/90

USE A 2ND SHEET IF NEEDED

Remarks, elevation, source of data, etc.
VERTICAL ON BOTTOM OF SCREEN
10/10/90 AA-12-90

16. WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Cooley Drilling Co. Inc. 51-0524
REGISTERED BUSINESS NAME REGISTRATION NO.

Address DEXTER MI 48130

Signed ____ Date 8-23-90
AUTHORIZED REPRESENTATIVE

17. Rig Operator's Name:

KURT WINN & KEN PENCE

D67d 2/89

Authority: Act 368 PA 1978
Completion: Required
Penalty: Conviction of a violation of any provision is a misdemeanor

GEOLOGICAL SURVEY SAMPLE No. [ ]

B-1

WATER WELL RECORD
ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

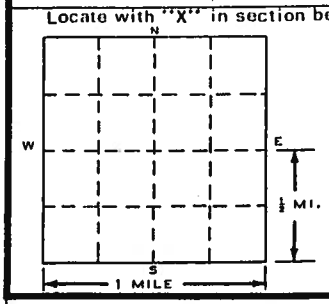
LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
WASHTENAW	ANN ARBOR	¼ ¼ ¼	31	N/S.	E/W.

Distance And Direction from Road Intersections: 1241 S. MAPLE

Street address & City of Well Location

Locate with "X" in section below — Sketch Map:



3 OWNER OF WELL:
Address: DU-PINE CO. 1241 S. MAPLE ANN ARBOR

4 WELL DEPTH: (completed) 214 ft. Date of Completion 5-24-73

5 ☐ Cable tool ☑ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE: ☑ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ____

7 CASING: Threaded ☑ Welded ☐
Diam. 4 in. to 210 ft. Depth
____ in. to ____ ft. Depth
Height: Above/Below Surface ____ ft.
Weight 11 lbs./ft.
Drive Shoe? Yes ☑ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
YELLOW CLAY	33	33
BLUE CLAY	114	147
FINE SILTY SAND W/LAYERS OF CLAY	64	211
GRAVEL	3	214

8 SCREEN:
Type: STAINLESS Dia.: 4"
Slot/Gauze 16 Length 4 FT.
Set between 210 ft. and 214 ft.
Fittings: HEMP PACKER PLUG 1 FT BLANK

9 STATIC WATER LEVEL
160 ft. below land surface

10 PUMPING LEVEL below land surface
175 ft. after 4 hrs. pumping 30 g.p.m.
____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million:
Iron (Fe) ____ Chlorides (Cl) ____
Hardness ____ Other ____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☑ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☑ Yes ☐ No
☐ Neat Cement ☑ Bentonite ☐ ____
Depth: From ____ ft. to ____ ft.

14 Nearest Source of possible contamination
160 feet W Direction DRAIN FIELD Type
Well disinfected upon completion ☑ Yes ☐ No

15 PUMP: ☐ Not installed
Manufacturer's Name GOULD
Model Number VEIH HP 1 Volts 230
Length of Drop Pipe 178 ft. capacity ____ G.P.M.
Type: ☑ Submersible ☐ Jet ☐ Reciprocating

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

replacement well

17 WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
SLUSSER DRILLING CO, INC 0256
REGISTERED BUSINESS NAME — REGISTRATION NO.
Address 1701 W MICHIGAN, YPSILANTI
Signed [signature] AUTHORIZED REPRESENTATIVE Date 5-29-73

D67d 100M (Rev. 12-68)

GEOLOGICAL SURVEY SAMPLE No. _____ B-1

WATER WELL RECORD
ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

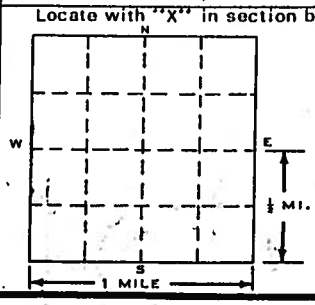
LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
WASHT	Ann Arbor	SW ¼ NW ¼ NE ¼	31	2 S.	5 E/W.

Distance And Direction from Road Intersections: 1514 S. Maple

Street address & City of Well Location

Locate with "X" in section below



Sketch Map:

3 OWNER OF WELL: Robert Buhl
Address 13420 Binshire Dr Detroit Mich

4 WELL DEPTH: (completed) 212 ft. Date of Completion June 30 70

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ____

7 CASING: Threaded ☐ Welded ☐
Diam. 4 in. to 208 ft. Depth
____ in. to ____ ft. Depth
Height: Above/Below Surface ____ ft.
Weight 11 lbs./ft.
Drive Shoe? Yes ☒ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Yellow clay	15	15
Blue clay	65	50
Sand Gravel (Dry)	20	100
Blue clay Gravel	100	200
Sand Gravel	12	212

USE A 2ND SHEET IF NEEDED

8 SCREEN:
Type: Red Brass Dia.: 4"
Slot/Gauze 25 Length 4'
Set between 208 ft. and 212 ft.
Fittings: Hemp Packer Plug 1' Blank

9 STATIC WATER LEVEL
____ ft. below land surface

10 PUMPING LEVEL below land surface
180 ft. after 2 hrs. pumping 12 g.p.m.
____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million:
Iron (Fe) ____ Chlorides (Cl) ____
Hardness ____ Other ____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☒ Yes ☐ No
☐ Neat Cement ☒ Bentonite ☐ ____
Depth: From ____ ft. to ____ ft.

14 Nearest Source of possible contamination
100 feet W Direction Drain Field Type
Well disinfected upon completion ☒ Yes ☐ No

15 PUMP: ☐ Not installed
Manufacturer's Name Gould
Model Number UEH HP 1/4 Volts 220
Length of Drop Pipe 187 ft. capacity 10 G.P.M.
Type: ☒ Submersible ☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

Replacement Well

17 WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

P.B. Slusser Well Drilling Co. 0348
REGISTERED BUSINESS NAME REGISTRATION NO.

Address 715 Cambridge Ypsilanti

Signed Richard D Sluss Date 6-30-70
AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

B-14

GEOLOGICAL SURVEY SAMPLE No. [ ]

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

LOCATION OF WELL

County: Washtenaw | Twp.: Ann Arbor | Fraction: ¼ ¼ ¼ | Section No.: 32 | Town: 2 N(S) | Range: 6 (E/W)

Distance And Direction from Road Intersections: 637 Turner Park Ct

Street address & City of Well Location: Ann Arbor Mich.

OWNER No.

3 OWNER OF WELL: Daniel Montgomery

Address: 637 Turner Park Ct

Ann Arbor, Mich.

4 WELL DEPTH: (completed) 171 ft. Date of Completion 11-5-70

5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ___

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ___

7 CASING: Threaded ☒ Welded ☐

Diam. 4 in. to 124 ft. Depth

___ in. to ___ ft. Depth

Height: Above/Below surface 1 ft.

Weight 11 lbs/ft.

Drive Shoe? Yes ☒ No ☐

8 SCREEN:

Type: Point Dia.:

Slot/Gauze Length

Set between ft. and ft.

Fittings:

9 STATIC WATER LEVEL

25 ft. below land surface

10 PUMPING LEVEL below land surface

100 ft. after 3 hrs. pumping 7 g.p.m.

___ ft. after ___ hrs. pumping ___ g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) Chlorides (Cl)

Hardness

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Pitless Adapter ☐ 12" Above Grade

13 GROUTING:

Well Grouted? ☒ Yes ☐ No

Material: ☐ Neat Cement ☐ ___

Depth: From ft. to ft.

14 SANITARY: City Sewer

Nearest Source of possible contamination

feet Direction Type

Well disinfected upon completion ☐ Yes ☐ No

15 PUMP:

Manufacturer's Name Reda

Model Number SD7 P05 1 HP 1/2

Length of Drop Pipe 100 ft. capacity 7 G.P.M.

Type: ☒ Submersible ☐ ___ ☐ Jet ☐ Reciprocating

12 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Clay	167	169
w. Det (water)	2	171

16 Remarks, elevation, source of data, etc.

City of A.A.

Private well

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Cubley Drilling Co. Inc 134

REGISTERED BUSINESS NAME. REGISTRATION NO.

Address: Dexter Mich

Signed: [signature] Date: 11-6-70

AUTHORIZED REPRESENTATIVE

GEOLOGICAL SURVEY SAMPLE NO. _____ D-1

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

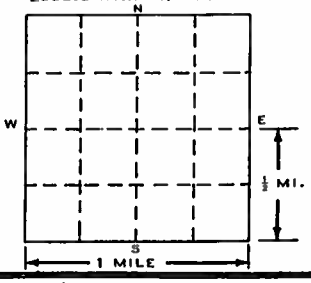
LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Washtenaw	City of Ann Arbor	SW¼ SW¼ SW¼	32	T 2 S.	6 E/W

Distance And Direction from Road Intersections

Street address & City of Well Location 2055 Welch Ct. AA MI

Locate with "X" in section below



Sketch Map:

3 OWNER OF WELL:
T. Aprill & H. Hildebrandt
Address
2055 Welch Ct. & 2039 Welch Ct.

4 WELL DEPTH: (completed) 156 ft. Date of Completion 7-9-76

5 [X] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Jetted [ ] Bored [ ] _____

6 USE: [ ] Domestic [ ] Public Supply [ ] Industry
[X] Irrigation [ ] Air Conditioning [ ] Commercial
[ ] Test Well [ ] _____

7 CASING: Threaded [X] Welded [ ]
Diam. 4 in. to 156 ft. Depth
____ in. to ____ ft. Depth
Height: Above/Below Surface _____ ft.
Weight _____ lbs./ft.
Drive Shoe? Yes [ ] No [ ]

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Yellow clay	28	28
Clay & gravel	9	37
Clay, sand & gravel	59	96
Coarse dirty gravel	2	98
Dirty gravel	2	100
Hard clay	52	152
Sand	2	154
Sand & gravel (dirty)	2	156
Clay & gravel	1	157
Well yields 1 gpm @ 96-100'		
well yields 3-4 gpm @ 152-156'		
At 156' drilling stopped per		
instructions of owners.		
Casing pulled out, hole grouted shut.		

USE A 2ND SHEET IF NEEDED

8 SCREEN:
Type: Slotted SS Dia.: 4"
Slot 40 Length 4'
Set between 152 ft. and 156 ft.
Fittings: Removed after test

9 STATIC WATER LEVEL
80' ft. below land surface

10 PUMPING LEVEL below land surface
156' ft. after 2 hrs. pumping 3-4 g.p.m.
_____ ft. after ___ hrs. pumping _____ g.p.m.

11 WATER QUALITY in Parts Per Million:
Iron (Fe) _____ Chlorides (Cl) _____
Hardness _____ Other _____

12 WELL HEAD COMPLETION: [ ] In Approved Pit
[ ] Pitless Adapter [ ] 12" Above Grade

13 Well Grouted? [ ] Yes [ ] No
[ ] Neat Cement [ ] Bentonite [ ] _____
Depth: From _____ ft. to _____ ft.

14 Nearest Source of possible contamination
_____ feet _____ Direction _____ Type
Well disinfected upon completion [ ] Yes [ ] No

15 PUMP: [X] Not installed
Manufacturer's Name _____
Model Number _____ HP ___ Volts _____
Length of Drop Pipe _____ ft. capacity ___ G.P.M.
Type: [ ] Submersible
[ ] Jet [ ] Reciprocating

16 Remarks, elevation, source of data, etc.

Water clear & nice just a low flow (yield) J. E. S.

17 WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

J. P. Schmitt & Co. 0019
REGISTERED BUSINESS NAME REGISTRATION NO.

Address 4540 Saline Rd. Ann Arbor

Signed John E. Schmitt Date 7-12-76
AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

B-1

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

WATER WELL AND PUMP RECORD

PERMIT NUMBER

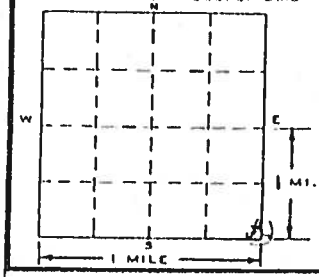
LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
WASHTENAW	ANN ARBOR	SE 1/4 SE 1/4 SE 1/4	32	2 N/S	6 E/W

Distance And Direction From Road Intersection: UNIVERSITY GOLF COURSE STADIUM BLVD ANN ARBOR MI.

Street Address & City of Well Location

Locate with "X" in Section Below



Sketch Map: STADIUM BLVD. STATE ROAD

3 OWNER OF WELL: UNIVERSITY OF MICHIGAN ENGINEERING SERVICE

Address: 320 E. HURON ANN ARBOR, MI 48109

Address Same As Well Location? ☐ Yes ☒ No

4 WELL DEPTH: 260 FT. | Date Completed: MO. 11 DAY 30 YEAR 89 | ☐ New Well ☐ Replacement Well

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ _____

6 USE: ☐ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☒ Test Well ☐ Type IIb Public ☐ _____

7 CASING: Diameter ☐ Steel ☐ Threaded ☐ Plastic ☐ Welded

_____ in. to _____ ft. depth

_____ in. to _____ ft. depth

Grouted Drill Hole Diameter

_____ in. to _____ ft. depth

_____ in. to _____ ft. depth

Height: Above/Below Surface _____ ft

Weight _____ lbs./ft.

Drive Shoe ☐ Yes ☐ No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
YELLOW CLAY	15	15
GRAY CLAY	15	30
GRAVELLY YELLOW CLAY	2	32
GRAY CLAY W/ LITTLE GRAVEL	6	44
VERY FINE SAND	14	58
GRAVEL	2	60
GRAVELLY GRAY CLAY	16	76
GRAY CLAY	84	160
GRAVEL	3	163
GRAY CLAY	3	166
GRAVEL - FINE	8	174
SAND - FINE	14	188
GRAY CLAY	24	212
SAND - VERY FINE (SILT)	10	222
GRAY CLAY	25	247

8 SCREEN: ☐ Not Installed

Type _____ Diameter _____

Slot/Gauze _____ Length _____

Set between _____ ft. and _____ ft.

FITTINGS: ☐ K-Packer ☐ Lead Packer ☐ Bremer Check ☐ Blank above screen _____ ft. Other _____

9 STATIC WATER LEVEL: _____ ft. below land surface ☐ Flow

10 PUMPING LEVEL: below land surface

_____ ft. after _____ hrs. pumping at _____ G.P.M.

_____ ft. after _____ hrs. pumping at _____ G.P.M.

11 WELL HEAD COMPLETION: ☐ Pitless adapter ☐ 12" above grade ☐ Basement offset ☐ Approved pit

12 WELL GROUTED? ☐ No ☐ Yes From _____ to _____ ft

☐ Neat cement ☐ Bentonite ☐ Other _____

No. of bags of cement _____ Additives _____

13 Nearest source of possible contamination

Type _____ Distance _____ ft. Direction _____

Well disinfected upon completion? ☐ Yes ☐ No

Was old well plugged? ☐ Yes ☐ No

14 PUMP: ☐ Not Installed ☐ Pump Installation Only

Manufacturer's name _____

Model number _____ HP _____ Volts _____

Length of Drop Pipe _____ ft. capacity _____ G.P.M.

TYPE: ☐ Submersible ☐ Jet _____

PRESSURE TANK:

Manufacturer's name _____

Model number _____ Capacity _____ Gallons

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NOV 0 8 1989

ENVIRONMENTAL HEALTH

Remarks, elevation, source of data, etc.

16. WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Leighley Drilling Co Inc 81-0524

REGISTERED BUSINESS NAME REGISTRATION NO.

Address DEXTER, MI 48130

Signed Jack O Leighley AUTHORIZED REPRESENTATIVE Date 11-6-89

17. RECEIVED BY STATE WELL RECORD

Lori Wray & Kim Heneee

11-0-89

67d 2/89

Authority: Act 368 PA 1978

Completion: Required

Penalty: Conviction of a violation

GEOLOGICAL SURVEY NO

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

WATER WELL AND PUMP RECORD

PERMIT NUMBER

B-

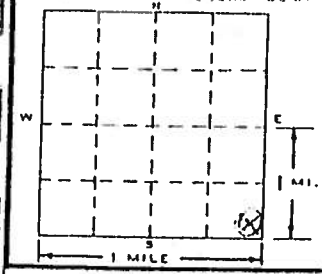
LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Washtenaw	Ann Arbor	SE 1/4 SE 1/4 SE 1/4	32	2 N/S	[illegible] E/W

Distance And Direction From Road Intersection: University Golf Course, Stadium Blvd, Ann Arbor, MI

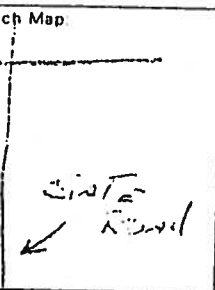
Street Address & City of Well Location

Locate with "X" in Section Below



Sketch Map: Stadium Blvd, State Road

1 MI. 1 MILE



3 OWNER OF WELL: University of Michigan Engineering Service

Address: 326 E Hoover, Ann Arbor, MI 48109

Address Same As Well Location? ☐ Yes ☒ No

4 WELL DEPTH: 260 FT. Date Completed: MO. 10 DAY 30 YEAR 89 ☐ New Well ☐ Replacement Well

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

6 USE: ☐ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☒ Test Well ☐ Type IIb Public ☐ ____

7 CASING: Diameter ☐ Steel ☐ Threaded ☐ Plastic ☐ Welded

____ in. to ____ ft. depth

____ in. to ____ ft. depth

Grouted Drill Hole Diameter

____ in. to ____ ft. depth

____ in. to ____ ft. depth

Height: Above/Below Surface ____ ft.

Weight ____ lbs./ft.

Drive Shoe ☐ Yes ☐ No

2 FORMATION DESCRIPTION

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Gravel	3	250
Gray Clay	10	260
Bottomed on Shale Rock		

8 SCREEN: ☐ Not Installed

Type ____ Diameter ____

Slot/Gauze ____ Length ____

Set between ____ ft. and ____ ft.

FITTINGS: ☐ K-Packer ☐ Lead Packer ☐ Bremer Check

☐ Blank above screen ____ ft. Other ____

9 STATIC WATER LEVEL:

____ ft. below land surface ☐ Flow

10 PUMPING LEVEL: below land surface

____ ft. after ____ hrs. pumping at ____ G.P.M.

____ ft. after ____ hrs. pumping at ____ G.P.M.

11 WELL HEAD COMPLETION: ☐ Pitless adapter ☐ 12" above grade ☐ Basement offset ☐ Approved pit

12 WELL GROUTED? ☐ No ☐ Yes From ____ to ____ ft.

☐ Neat cement ☐ Bentonite ☐ Other ____

No. of bags of cement ____ Additives ____

13 Nearest source of possible contamination

Type ____ Distance ____ ft. Direction ____

Well disinfected upon completion? ☐ Yes ☐ No

Was old well plugged? ☐ Yes ☐ No

14 PUMP ☐ Not Installed ☐ Pump Installation Only

Manufacturer's name ____

Model number ____ HP ____ Volts ____

Length of Drop Pipe ____ ft. capacity ____ G.P.M.

TYPE: ☐ Submersible ☐ Jet ____

PRESSURE TANK

Manufacturer's name ____

Model number ____ Capacity ____ Gallons

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ENVIRONMENTAL HEALTH

USE A 2ND SHEET IF NEEDED

Remarks, elevation, source of data, etc.

NOTE: No casing was set. Hole was filled bottom up with [illegible]

16. WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Cribley Drilling Co Inc — REGISTERED BUSINESS NAME

81-0524 — REGISTRATION NO.

Address: Dexter, MI 48130

Signed: [signature] — AUTHORIZED REPRESENTATIVE

Date: 11-6-89

17. Rig Operator's Name: [illegible] & Ken Pearce

067d 2/89

Authority: Act 368 PA 1978

Completion: Required

Penalty: Conviction of a violation

B-11

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

GEOLOGICAL SURVEY NO

WATER WELL AND PUMP RECORD

PERMIT NUMBER

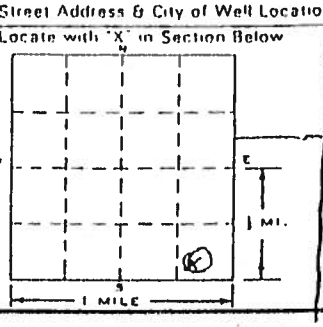
LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
WASHTENAW	ANN ARBOR	SW ¼ SE ¼ SE ¼	32	2 N/S	6 E/W

Distance And Direction From Road Intersection: 500 EAST STADIUM, ANN ARBOR, MI 48109

Street Address & City of Well Location

Locate with "X" in Section Below



Sketch Map: S. MAIN, E. STADIUM, STATE

3 OWNER OF WELL: U OF M GOLF COURSE
Address: 500 EAST STADIUM ANN ARBOR MI. 48109

Address Same As Well Location? ☒ Yes ☐ No

4 WELL DEPTH: 255 FT. | Date Completed MO 7 DAY 19 YEAR 91 | ☒ New Well ☐ Replacement Well

6 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

6 USE: ☐ Domestic ☐ Type I Public ☐ Type III Public ☒ Irrigation ☐ Type IIa Public ☐ Heat pump ☒ Test Well ☐ Type IIb Public ☐ ____

7 CASING: Diameter ☐ Steel ☐ Threaded ☐ Plastic ☐ Welded
____ in. to ____ ft. depth
____ in. to ____ ft. depth
Grouted Drill Hole Diameter 7 7/8 in. to 255 ft. depth
____ in. to ____ ft. depth
Height Above/Below Surface ____ ft
Weight ____ lbs /ft
Drive Shoe ☐ Yes ☐ No

8 SCREEN: ☒ Not Installed
Type ____ Diameter ____
Slot/Gauze ____ Length ____
Set between ____ ft. and ____ ft.
FITTINGS: ☐ K-Packer ☐ Lead Packer ☐ Bremer Check ☐ Blank above screen ____ ft. Other ____

9 STATIC WATER LEVEL: 0 ft. below land surface ☐ Flow

10 PUMPING LEVEL. below land surface
____ ft. after ____ hrs. pumping at ____ G.P.M.
____ ft. after ____ hrs. pumping at ____ G.P.M.

11 WELL HEAD COMPLETION: ☐ Pitless adapter ☐ 12" above grade ☐ Basement offset ☐ Approved pit

12 WELL GROUTED? ☐ No ☒ Yes From 0 to 255 ft
☐ Neat cement ☐ Bentonite ☒ Other BEN SEAL
No. of bags of cement ____ Additives ____

13 Nearest source of possible contamination
Type 0 Distance ____ ft. Direction ____
Well disinfected upon completion? ☐ Yes ☒ No
Was old well plugged? ☐ Yes ☐ No

14 PUMP: ☒ Not Installed ☐ Pump Installation Only
Manufacturer's name ____
Model number ____ HP ____ Volts ____
Length of Drop Pipe ____ ft. capacity ____ G.P.M.
TYPE: ☐ Submersible ☐ Jet ____
PRESSURE TANK:
Manufacturer's name ____
Model number ____ Capacity ____ Gallons

2 FORMATION DESCRIPTION

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
WELL #1		
YELLOW CLAY	20	20
GRAY CLAY	125	145
BROWN CLAY	15	160
GRAY CLAY	13	173
GRAVEL	2	175
GRAY CLAY	61	236
GRAVEL	3	239
GRAY CLAY & ROCKS	14	253
SHALE	2	255

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ENVIRONMENTAL HEALTH

NOTE — HOLE ABANDONED.

USE A 2ND SHEET IF NEEDED

5. Remarks, elevation, source of data, etc.
7 7/8 DRILLING — NO PIPE SET
BEN SEAL GROUTED

17. Rig Operator's Name:
KURT WING / KEN PEARCE

16. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
81-0524
CEDLEY DRILLING CO INC
REGISTERED BUSINESS NAME — REGISTRATION NO
Address DEXTER MI 48130
Signed Jack C. Clark (AUTHORIZED REPRESENTATIVE) Date 8-9-91

D67d 2/89

Authority: Act 368 PA 1978
Completion: Required

B-1

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
WATER WELL AND PUMP RECORD

PERMIT NUMBER

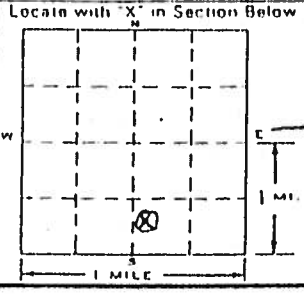
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
WASHTENAW	ANN ARBOR	NW ¼ SW ¼ SE ¼	32	2 S	6 E/W

Distance And Direction From Road Intersection: 500 EAST STADIUM ANN ARBOR, MI 48109

Street Address & City of Well Location

Locate with "X" in Section Below



Sketch Map: S MAIN, S. STATE, E. STADIUM

3 OWNER OF WELL U of M GOLF COURSE
500 EAST STADIUM
Address ANN ARBOR, MI 48109
Address Same As Well Location? ☒ Yes ☐ No

4 WELL DEPTH: 231 FT. Date Completed MO 7 DAY 22 YEAR 91 ☒ New Well ☐ Replacement Well

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

6 USE ☐ Domestic ☐ Type I Public ☐ Type III Public ☒ Irrigation ☐ Type IIa Public ☐ Heat pump ☒ Test Well ☐ Type IIb Public ☐ ____

7 CASING Diameter ☐ Steel ☐ Threaded ☒ Plastic ☐ Welded
5 in. to 206 ft. depth
____ in. to ____ ft. depth
Grouted Drill Hole Diameter
8 in. to 160 ft. depth
____ in. to ____ ft. depth
Height: Above/Below Surface 1 ft.
Weight SDR 21 & 17
Drive Shoe ☐ Yes ☒ No

8 SCREEN ☐ Not Installed
Type STAINLESS WIRE Diameter 5" NOM
Slot/Gauge SEE NOTE Length 25
Set between 206 ft. and 231 ft.
FITTINGS ☒ K-Packer ☐ Lead Packer ☐ Bremer Check
☒ Blank above screen 1 ft. Other ____

9 STATIC WATER LEVEL
56 ft. below land surface ☐ Flow

10 PUMPING LEVEL below land surface ESTIMATED
? ft. after 2 hrs. pumping at 250 G P M
____ ft. after ____ hrs. pumping at ____ G P M

11 WELL HEAD COMPLETION ☐ Pitless adapter ☒ 12" above grade ☐ Basement offset ☐ Approved pit

12 WELL GROUTED? ☐ No ☒ Yes From 0 to 160 ft
☐ Neat cement ☐ Bentonite ☒ Other BEN SEAL
No. of bags of cement ____ Additives ____

13 Nearest source of possible contamination
Type ____ Distance ____ ft. Direction ____
Well disinfected upon completion? ☐ Yes ☒ No
Was old well plugged? ☐ Yes ☐ No

14 PUMP ☒ Not Installed ☐ Pump Installation Only
Manufacturer's name ____
Model number ____ HP ____ Volts ____
Length of Drop Pipe ____ ft. capacity ____ G P M
TYPE: ☐ Submersible ☐ Jet ____
PRESSURE TANK
Manufacturer's name ____
Model number ____ Capacity ____ Gallons

2 FORMATION DESCRIPTION

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
WELL #2		
BROWN CLAY	11	11
GRAY CLAY	58	69
FINE SAND	6	75
GRAY CLAY	52	127
BROWN CLAY	5	132
GRAY CLAY	23	155
SAND	7	162
GRAY CLAY	3	165
SAND - FINE	36	201
SAND - COURSE	30	231
NOTE		
JOHNSON FILTRATION RECOMMENDATION		
TOP 5FT 30 SLOT		
BOTTOM 15FT 60 SLOT		

USE A 2ND SHEET IF NEEDED

RECEIVED AUG 9 1991 ENVIRONMENTAL

15 Remarks, elevation, source of data, etc.
TOP TO BOTTOM
4'-30 = 4'-35 = 81.40 = 4'-00

16. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
CROLEY DRILLING CO INC 81-0524
REGISTERED BUSINESS NAME REGISTRATION NO.
Address DEXTER MI 48130
Signed Jack C. Clark Date 8-9-91
AUTHORIZED REPRESENTATIVE

17. Rig Operator's Name: KURT WILY / KEN PEARCE AND

D67d 2/89

Authority: Act 368 PA 1978
Completion: Required

LOGICAL SURVEY SAMPLE No. _____ B-20

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

TION OF WELL

ty	Twp.	Fraction	Section No.	Town	Range
Washt	Ann Arbor	¼ ¼ ¼	33	N/S.	E/W.

ance And Direction from Road Intersections

OWNER No. _____

1565 Eastover

t address & City of Well Location

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Yellow Sand	10	10
Blue clay	2	12
Gravel-sand	38	50
Gravel-Gravel	6	56

arks, elevation, source of data, etc.

3 OWNER OF WELL: Dave Roloff

Address: 1565 East [illegible] Ann Arbor

4 WELL DEPTH: (completed) 56 ft. Date of Completion

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ___

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ___

7 CASING: Diam. Threaded ☒ Welded ☐

4 in. to 52 ft. Depth

___ in. to ___ ft. Depth

Height: Above/Below surface ___ ft.

Weight 11 lbs/ft.

Drive Shoe? Yes ☒ No ☐

8 SCREEN:

Type: Peel Brass Dia.: 4"

Slot/Gauze 20 Length 4"

Set between 52 ft. and 56 ft.

Fittings: Hemp Pack Plug 1' Blank

9 STATIC WATER LEVEL

20 ft. below land surface

10 PUMPING LEVEL below land surface

4 ft. after 2 hrs. pumping 12 g.p.m.

___ ft. after ___ hrs. pumping ___ g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) ___ Chlorides (Cl) ___

Hardness ___

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 GROUTING:

Well Grouted? ☒ Yes ☐ No

Material: ☐ Neat Cement ☐ [illegible]

Depth: From ___ ft. to ___ ft.

14 SANITARY:

Nearest Source of possible contamination

50 feet [illegible] Direction [illegible] Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP:

Manufacturer's Name [illegible]

Model Number [illegible] HP ½

Length of Drop Pipe 11 ft. capacity [illegible] G.P.M.

Type: ☒ Submersible ☐ ___ ☐ Jet ☐ Reciprocating

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

[illegible] Well [illegible]

REGISTERED BUSINESS NAME

REGISTRATION NO.

Address [illegible]

Signed [illegible] Date [illegible]

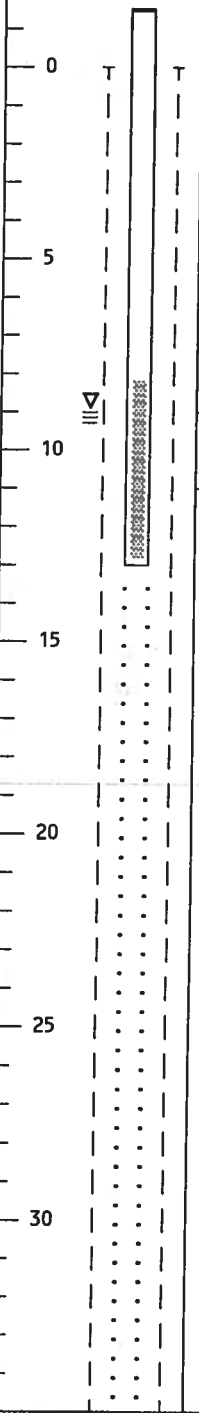
AUTHORIZED REPRESENTATIVE

The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Ann Arbor, Michigan 48108

Sheet 1 of 1

PROJECT: West Washington
LOCATION: 415 W.Washington Street
CLIENT: City of Ann Arbor
PROJECT NUMBER: 672B
DRILLER: Libby **HELPER:** J & K
INSTALLATION DATE: 3/27/92

BORING/WELL #: MW-2
SURFACE ELEVATION: N/A
TOP OF CASING ELEV: N/A
STATIC WATER LEVEL: 9'
DEVELOPMENT: Bailer
WEATHER: N/A



SAMPLE TYPE	SAMPLING METHOD	DEPTH BELOW GRADE	SOIL DESCRIPTION	SOIL CLASS
		0'9"	Asphalt and stones	
		1'0"	Concrete	
Soil	SS	5'-7'	Mixed sand and cinder fill	
		6'6"		
		7'6"	Peat	
Soil	SS	7'-9'	Peat, moist	
		9'0"		
Soil	SS	9'-11'	Medium sand, brown, wet	

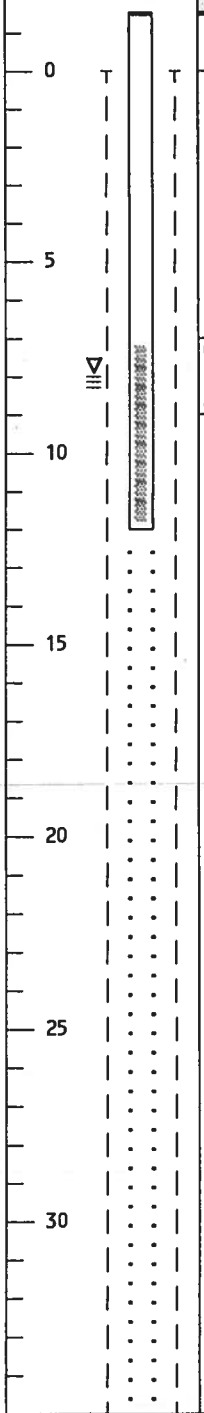
CASING: DIAMETER: 2" **TYPE:** Galvanized **LENGTH:** 10'
SCREEN: DIAMETER: 2" **SLOT:** N/A **TYPE:** Stainless **LENGTH:** 5' **INTERVAL:** 8'-13'
PLUGGING/SEALING METHOD: Cement plug from 0'-4'6", bentonite chips to 7', sand backfill to 13'.
COMMENTS:

The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Ann Arbor, Michigan 48108

Sheet 1 of 1

PROJECT: West Washington
LOCATION: 415 W.Washington Street
CLIENT: City of Ann Arbor
PROJECT NUMBER: 672B
DRILLER: Libby **HELPER:** J & K
INSTALLATION DATE: 3/27/92

BORING/WELL #: MW-3
SURFACE ELEVATION: N/A
TOP OF CASING ELEV: N/A
STATIC WATER LEVEL: 8'
DEVELOPMENT: Bailer
WEATHER: N/A



SAMPLE TYPE	SAMPLING METHOD	DEPTH BELOW GRADE		SOIL DESCRIPTION	SOIL CLASS
		0'3"		Asphalt	
		1'0"		Concrete	
				Mixed sand and cinder fill	
Soil	SS	7'-9'	8'0"	Medium brown sand, wet	

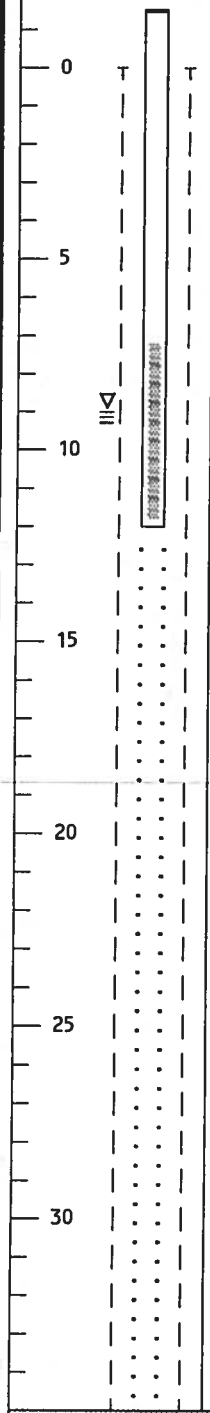
CASING: DIAMETER: 2" **TYPE:** Galvanized **LENGTH:** 10'
SCREEN: DIAMETER: 2" **SLOT:** N/A **TYPE:** Stainless **LENGTH:** 5' **INTERVAL:** 7'-12'
PLUGGING/SEALING METHOD: Cement plug from 0'-4', bentonite chips to 6', sand backfill to 12'
COMMENTS:

The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Ann Arbor, Michigan 48108

Sheet 1 of 1

PROJECT: West Washington
LOCATION: 415 W.Washington Street
CLIENT: City of Ann Arbor
PROJECT NUMBER: 672B
DRILLER: Libby **HELPER:** J & K
INSTALLATION DATE: 3/27/92

BORING/WELL #: MW-1
SURFACE ELEVATION: N/A
TOP OF CASING ELEV: N/A
STATIC WATER LEVEL: 8'6"
DEVELOPMENT: Bailer
WEATHER: N/A



SAMPLE TYPE	SAMPLING METHOD	DEPTH BELOW GRADE	SOIL DESCRIPTION	SOIL CLASS
		0'3"	Asphalt	
		1'0"	Stones	
Soil	SS	1'-3'	Mixed sand, cinders, and wood fill	
Soil	SS	3'-5' 3'9"		
Soil	SS	5'-7'	Silty sand fill, brown	
		6'9"	Black, peat	
Soil	SS	7'-9' 8'0"	Peat	
		8'6"	Sand and gravel, brown, wet	
Soil	SS	9'-11'		
		10'3"	Brown, medium sand	

CASING: DIAMETER: 2" **TYPE:** Galvanized **LENGTH:** 10'
SCREEN: DIAMETER: 2" **SLOT:** N/A **TYPE:** Stainless **LENGTH:** 5' **INTERVAL:** 7'-12'
PLUGGING/SEALING METHOD: Cement plug from 0'-4'6", bentonite chips to 6', sand backfill to 12'
COMMENTS:

45 DAY REPORT
FOR A UNDERGROUND STORAGE TANK
RELEASE AT
THE CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 WEST WASHINGTON STREET
ANN ARBOR, MICHIGAN 48103

APPENDIX C: MONITORING WELL LOGS

DOCUMENT	PAGE
415 West Washington Street	
Monitoring Well MW-1	C-1
Monitoring Well MW-2	C-2
Monitoring Well MW-3	C-3

45 DAY REPORT
FOR A UNDERGROUND STORAGE TANK
RELEASE AT
THE CITY OF ANN ARBOR
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APPENDIX D: ANALYTICAL RESULTS OF WATER SAMPLES

DOCUMENT	PAGE
03/24/92 Pit Water BTEX Report	D-1
03/24/92 Pit Water Chain of Custody	D-2
QA/QC Lab Report	D-3

ENVIRONMENTAL QUALITY LABORATORIES, INC.

6540 Diplomat Drive
Sterling Heights, Michigan 48314-1420
(313) 731-1818
Outside Michigan Dial 1-800-368-5227
Fax Line 313-731-2590

CLIENT NAME: THE TRAVERSE GROUP, INC. SAMPLE NO. 1748
3772 PLAZA DRIVE, SUITE 5
AIRPORT PLAZA PARK
ANN ARBOR, MI 48108
SAMPLE DESCRIPTION: 415 W-WASHINGTON #672A
PIT WATER
DATE REPORTED: 03/30/92
DATE RECEIVED: 03/25/92

ORGANICS ANALYSIS DATA SHEET
8020 SCAN

COMPOUND NAME	REFERENCE METHOD	CONCENTRATION
BENZENE	8020/5030	9700 ppBillion
ETHYL BENZENE	8020/5030	2200 ppBillion
TOLUENE	8020/5030	19000 ppBillion
XYLENES	8020/5030	28000 ppBillion

***NOTE: TERM LESS THAN DENOTES DETECTION LIMIT OF TEST.**

JAMES TOMALIA, LABORATORY SUPERVISOR

C. BLOOM, ASSISTANT LABORATORY SUPERVISOR

REFERENCES: 40 CFR PART 136. CURRENT EDITION.
11

The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Airport Plaza Park
Ann Arbor, Michigan 48108

CHAIN OF CUSTODY RECORD

COMMENTS:

COOLER #

PROJECT NO.: 672A

CLIENT/SITE: 415 W. Washington

SAMPLERS (Signature):

DATE	TIME	SAMPLE LOCATION	SAMPLE DEPTH	# OF SAMPLES	SAMPLE TYPE	PRESERVED	BTEX	PNA	TOTAL LEAD	PCB	CADMIUM	CHROMIUM	MTBE	TPH
3/24/92		R.T WATER	17'8"	2	W		X							

TYPE OF ANALYSIS

ACCEPTABLE ANALYTICAL METHODS

PARAMETER	SOIL METHOD	SOIL MDL ug/Kg	GROUND WATER METHOD	GROUND WATER MDL ug/Kg
BTEX		1		10
PNA				
LEAD				
PCB				
Cd				
Cr				
MTBE				
TPH				

	TIME	DATE		TIME	DATE		TIME	DATE
RELINQUISHED BY: (Signature)	12:15	3/25/92	RECEIVED BY: (Signature)			RECEIVED FOR LAB BY: (Signature)		
RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)			DATE ENTERED BY: (Signature)		
RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)			REMARKS		

ENVIRONMENTAL QUALITY LABORATORIES, INC.

6540 Diplomat Drive
Sterling Heights, Michigan 48314-1420
(313) 731-1818
Outside Michigan Dial 1-800-368-5227
Fax Line 313-731-2590

IENT: THE TRAVERSE GROUP, INC.
3772 PLAZA DRIVE, SUITE 5
AIRPORT PLAZA PARK
ANN ARBOR, MI 48108

DATE RECEIVED: 3/25/92

OJECT NAME AND NUMBER: #672A 415 W. WASHINGTON

B NO.'s IN BATCH: 1748
TRIX: WATER

METHOD SPIKE DUPLICATES

THOD	METHOD ANALYTE	MATRIX SPIKE	MATRIX SPIKE DUP	% RECOV	% RSD	SAMPLE RECEV SPIKE	ANALYS DATE	METHOD BLANK RESULT	TRIP BLANK RESULT	REF. CHECK STD REC
020	SPIKED	ppB	ppB					ppB		
	BENZENE	24	24	96	0	1752	3/26/92	<1.0	N/A	N/A
	TOLUENE	25	24	98	3	1752	3/26/92	<1.0	N/A	N/A
	E.BENZENE	25	23	96	6	1752	3/26/92	<1.0	N/A	N/A
	XYLENE	25	23	96	6	1752	3/26/92	<1.0	N/A	N/A

MMENTS/CRITERIA:
- % RECOVERY OF SPIKES SHOULD BE BETWEEN 60 AND 140%
- % RSD OF DUPLICATES SHOULD BE LESS THAN 30%
- METHOD AND TRIP BLANK CONCENTRATIONS MUST BE BELOW REPORTABLE DETECTION LIMITS
- REFERENCE CHECK STANDARD IS METHOD DEPENDENT

nes Tomalia, Lab Supervisor J. Tomalia

Bloom, Assistant Lab Supervisor C. Bloom

45 DAY REPORT
FOR A UNDERGROUND STORAGE TANK
RELEASE AT
THE CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 WEST WASHINGTON STREET
ANN ARBOR, MICHIGAN 48103

APPENDIX E:
ENVIRONMENTAL PROTECTION AGENCY HAZARDOUS WASTE MANIFESTS

DOCUMENT	PAGE
Water/Product Pumped (03/20/92)	E-1
Water/Product Pumped (03/23/92)	E-2

DNR
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
ATT. ☐ DIS. ☐ REJ. ☐ PR. ☐

1979, as amended and Act 136, PA 1969.
Failure to file is punishable under section 299.548 MCL or Section 10 of Act 136, P.A. 1969.

E-1

Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: MIP200000776 — Manifest Document No.: 00001
2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address: City of Ann Arbor, 415 W. Washington, Ann Arbor, MI 48107
4. Generator's Phone ( )
5. Transporter 1 Company Name: Michigan Pumping Service
6. US EPA ID Number: MID010871234
7. Transporter 2 Company Name:
8. US EPA ID Number:
9. Designated Facility Name and Site Address: ENVIRONMENTAL WASTE CONTROL, 27340 Princeton Ave, Lakeville, MI 48141
10. US EPA ID Number: MID057002602

A. State Manifest Document Number: MI 2041867
B. State Generator's ID:
C. State Transporter's ID:
D. Transporter's Phone:
E. State Transporter's ID:
F. Transporter's Phone:
G. State Facility's ID:
H. Facility's Phone:

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER).	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a. Water + Gasoline D001	✓	001	TT	01200	G	D001	#
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above: Also D018

K. Handling Codes for Wastes Listed Above: a/ / b/ / c/ / d/ /

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Mark Tussing — Representative for Cdg & A2 — Signature: [signature] — Date: Month 03 Day 20 Year 92

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Paul Brosseur — Signature: Paul Brosseur — Date: Month 03 Day 20 Year 92

18. Transporter 2 Acknowledgement or Receipt of Materials
Printed/Typed Name: — Signature: — Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: — Signature: — Date: Month Day Year

EPA Form 8700-22 (Rev. 9/88) — To be mailed by Generator to: Michigan DNR, Box 30038, Lansing, MI 48909 — PR 5110 Rev. 9/88

DNR
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
ATT. ☐ DIS ☐ REJ. ☐ PR. ☐

1979 as amended and Act 136, P.A. 1969.
Failure to file is punishable under section 299.548 MCL or Section 10 of Act 136, P.A. 1969.

E-2

Please print or type

Form Approved OMB No. 2050-0039 Expires 9-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: MIP200000776 — Manifest Document No.: 00001
2. Page 1 of 1
Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address: City of Ann Arbor, 415 W Washington, Ann Arbor, MI 48107
4. Generator's Phone: (313) 994-6696
5. Transporter 1 Company Name: K+D Industrial Services
6. US EPA ID Number: MID072790710
7. Transporter 2 Company Name:
8. US EPA ID Number:
9. Designated Facility Name and Site Address: Environmental Waste Control, 27140 Princeton Ave, Inkster, MI 48141
10. US EPA ID Number: MID057002602

A. State Manifest Document Number: MI 2041839
B. State Generator's ID:
C. State Transporter's ID:
D. Transporter's Phone:
E. State Transporter's ID:
F. Transporter's Phone:
G. State Facility's ID:
H. Facility's Phone:

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a. ~~[illegible] Gasoline (RQ Gasoline) RQ Waste Flamable liquid NA 1993~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~D001~~	~~H~~
b. X RQ Waste Flamable liquid NA 1993 (RQ Gasoline, RQ Benzine)	001	TT	01100	G	D001	H
c.						
d.						

J. Additional Descriptions for Materials Listed Above: Also D018

K. Handling Codes for Wastes Listed Above: a/ b/ c/ d/

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable International and national government regulations.

K+D Dump No 040323

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment, OR; if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Daniel J. Cullen — Signature: Daniel J. Cullen — Date: Month 03 Day 23 Year 92

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Dan Totten — Signature: Dan Totten — Date: Month 03 Day 23 Year 92

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: — Signature: — Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: — Signature: — Date: Month Day Year

EPA Form 8700-22 (Rev. 9/88) To be mailed by Generator to: Michigan DNR, Box 30038, Lansing, MI 48909

PR 5110 Rev. 9/88

45 DAY REPORT
FOR A UNDERGROUND STORAGE TANK
RELEASE AT
THE CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 WEST WASHINGTON STREET
ANN ARBOR, MICHIGAN 48103

APPENDIX F: TANK DISPOSAL RECEIPT

DOCUMENT	PAGE
Tank Disposal Receipt (03/24/92)	F-1

TOWN & COUNTRY NO 193551
RECYCLING
3127 S. Wagner
TO Cecil Environmental DATE 3/24/1992
ADDRESS Hall Rd.
SHIP TO
ADDRESS

SHIP VIA	F.O.B.	TERMS	DATE REQUIRED

	QUANTITY ORDERED	QUANTITY RECEIVED	STOCK NUMBER/DESCRIPTION	PRICE	PER
1		2	Tanks Cut into Pieces	N/C	
2					
3					
4					
5					
6					
7			From W. Washington		
8			2- 6000 gallon UST		
9					
10					
11					
12					

IMPORTANT
OUR ORDER NUMBER MUST APPEAR ON INVOICES, PACKAGES AND CORRESPONDENCE. ADVISE US IF UNABLE TO DELIVER BY DATE REQUIRED.

CET 15
Buyer Dennis Sage

ORIGINAL

Wilson Jones • Carbonless • [illegible]

45 DAY REPORT
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RELEASE AT
THE CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 WEST WASHINGTON STREET
ANN ARBOR, MICHIGAN 48103

APPENDIX G: LANDFILL RECEIPTS

DOCUMENT	PAGE
Landfill Soil Disposal Receipt	
(#397986)	G-1
(#398016)	G-2
(#398007)	G-3
(#397994)	G-4
(#398048)	G-5
(#398049)	G-6
(#398037)	G-7
(#398038)	G-8

CITY OF ANN ARBOR
SANITARY LANDFILL
4120 Platt Rd.

RECEIPT 397986

NAME Risk Mgt. DATE

PAID BY: Cash ☐ Ticket ☐ No Charge ☐
Check ☐ Charge ☐ Other (explain) ☐

RATE: City ☐ Non-City ☐

UNITS	YARDAGE	AMOUNT
Car		
Pickup		
Truck		I TR CYD
Appliance		24@14.00 336.00
Building Material		CHARGE TL 336.00
Trailer		#796130 C200 R01 T08:4
City S.W.		03/20/9
City Other		
Clean Fill		

Truck No. [illegible] F.U.

Driver [illegible]

Point of Generation: [illegible] 415 W.W.

NOTICE: The City of Ann Arbor ASSUMES NO RESPONSIBILTY for damage to vehicles or personal injuries resulting from use of the Sanitary Landfill.
FOR YOUR SAFETY PLEASE USE EXTREME CARE AND CAUTION WHILE USING THE CITY'S SANITARY LANDFILL. This includes entering, exiting and while disposing of refuse. ALSO, respect all sign posting and instructions given by landfill personnel, at all times.

V-68 9/87 381.096-LG

CITY OF ANN ARBOR
SANITARY LANDFILL
4120 Platt Rd.

RECEIPT 398016

NAME Risk Mgt. DATE _____

PAID BY: Cash ☐ Check ☐ Ticket ☐ Charge ☐ No Charge ☐ Other (explain) ☐

RATE: City ☐ Non-City ☐

UNITS	YARDAGE	AMOUNT
Car		
Pickup		
Truck		1 TR CYD
Appliance		24@14.00 336.00
Building Material		CHARGE TL 336.00
Trailer		8796470 C200 R01 13:5
City S.W.		03/20/9
City Other		
Clean Fill		

Truck No. F.U.

Driver Lynn Lee

Point of Generation: ~~Fire~~ 415 W.W.

NOTICE: The City of Ann Arbor ASSUMES NO RESPONSIBILTY for damage to vehicles or personal injuries resulting from use of the Sanitary Landfill.
FOR YOUR SAFETY PLEASE USE EXTREME CARE AND CAUTION WHILE USING THE CITY'S SANITARY LANDFILL. This includes entering, exiting and while disposing of refuse. ALSO, respect all sign posting and instructions given by landfill personnel, at all times.

V-68 9/87

381.696-LG

CITY OF ANN ARBOR
SANITARY LANDFILL
4120 Platt Rd.

RECEIPT 398007

NAME Risk Mgt. DATE _____

PAID BY: Cash ☐ Check ☐ Ticket ☐ Charge ☐ No Charge ☐ Other (explain) ☐

RATE: City ☐ Non-City ☐

UNITS	YARDAGE	AMOUNT
Car		
Pickup		
Truck		1 IR CYD
Appliance		2@14.00 336.00
Building Material		CHARGE IL 336.00
Trailer		879380 C200 R01 111:2
City S.W.		03/20/9
City Other		
Clean Fill		

Truck No. 127 F.U.

Driver Woody Weaton

Point of Generation: 415 W. W

NOTICE: The City of Ann Arbor ASSUMES NO RESPONSIBILTY for damage to vehicles or personal injuries resulting from use of the Sanitary Landfill.
FOR YOUR SAFETY PLEASE USE EXTREME CARE AND CAUTION WHILE USING THE CITY'S SANITARY LANDFILL. This includes entering, exiting and while disposing of refuse. ALSO, respect all sign posting and instructions given by landfill personnel, at all times.

V-68 9/87

381.698-LG

CITY OF ANN ARBOR
SANITARY LANDFILL
4120 Platt Rd.

RECEIPT 397994

NAME Risk Mgt. DATE

PAID BY: Cash ☐ Check ☐ Ticket ☐ Charge ☐ No Charge ☐ Other (explain) ☐

RATE: City ☐ Non-City ☐

UNITS	YARDAGE	AMOUNT
Car		
Pickup		
Truck		1 TR CYD
Appliance		24014.00 336.00
Building Material		CHARGE TL 336.00
Trailer		[illegible]
City S.W.		[illegible]
City Other		
Clean Fill		

Truck No. 127

Driver [illegible]

Point of Generation: 415 W.W./Cont. Soil

NOTICE: The City of Ann Arbor ASSUMES NO RESPONSIBILTY for damage to vehicles or personal injuries resulting from use of the Sanitary Landfill.
FOR YOUR SAFETY PLEASE USE EXTREME CARE AND CAUTION WHILE USING THE CITY'S SANITARY LANDFILL. This includes entering, exiting and while disposing of refuse. ALSO, respect all sign posting and instructions given by landfill personnel, at all times.

V-68 9/87

381.696-1.G

CITY OF ANN ARBOR
SANITARY LANDFILL
4120 Platt Rd.

RECEIPT 398048

NAME Risk Mgt. DATE _____

PAID BY: Cash ☐ Check ☐ Ticket ☐ Charge ☐ No Charge ☐ Other (explain) ☐

RATE: City ☐ Non-City ☐

UNITS	YARDAGE	AMOUNT
Car		
Pickup		
Truck		
Appliance		
Building Material		
Trailer		
City S.W.		
City Other		
Clean Fill		

1 YR CYD
24@14.00 336.00
CHARGE TL 336.00
#T93960 C200 R01 T11:3
03/23/9

Truck No. 125 F.U.

Driver Brian Ferguson

Point of Generation: 415 W.W.

NOTICE: The City of Ann Arbor ASSUMES NO RESPONSIBILTY for damage to vehicles or personal injuries resulting from use of the Sanitary Landfill.
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V-68 9/87

381.696-LG

CITY OF ANN ARBOR
SANITARY LANDFILL
4120 Platt Rd.

RECEIPT 398049

NAME Risk Mgt. DATE

PAID BY: Cash ☐ Ticket ☐ No Charge ☐
Check ☐ Charge ☐ Other (explain) ☐

RATE: City ☐ Non-City ☐

UNITS	YARDAGE	AMOUNT
Car		
Pickup		
Truck		I TR CYD
Appliance		24@14.00 336.00
Building Material		CHARGE TL 336.00
Trailer		#796980 C200 R01 T11:44
City S.W.		03/23/92
City Other		
Clean Fill		

Truck No. 69 F.U

Driver [illegible]

Point of Generation: 415 Wh.

NOTICE: The City of Ann Arbor ASSUMES NO RESPONSIBILTY for damage to vehicles or personal injuries resulting from use of the Sanitary Landfill.
FOR YOUR SAFETY PLEASE USE EXTREME CARE AND CAUTION WHILE USING THE CITY'S SANITARY LANDFILL. This includes entering, exiting and while disposing of refuse. ALSO, respect all sign posting and instructions given by landfill personnel, at all times.

V-68 9/87

381.696-LG

CITY OF ANN ARBOR
SANITARY LANDFILL
4120 Platt Rd.

RECEIPT 398037

NAME Risk Mgt. DATE

PAID BY: Cash ☐ Check ☐ Ticket ☐ Charge ☐ No Charge ☐ Other (explain) ☐

RATE: City ☐ Non-City ☐

UNITS	YARDAGE	AMOUNT
Car		
Pickup		
Truck		I.IR CYD
Appliance		24814.00 336.00
Building Material		CHARGE TL 336.00
Trailer		N796050 C200 R01 T09:5
City S.W.		03/23/9
City Other		
Clean Fill		

Truck No. 125 F.U.

Driver Brian Ferguson

Point of Generation: 415 W.W.

NOTICE: The City of Ann Arbor ASSUMES NO RESPONSIBILTY for damage to vehicles or personal injuries resulting from use of the Sanitary Landfill.
FOR YOUR SAFETY PLEASE USE EXTREME CARE AND CAUTION WHILE USING THE CITY'S SANITARY LANDFILL. This includes entering, exiting and while disposing of refuse. ALSO, respect all sign posting and instructions given by landfill personnel, at all times.

V-68 9/87

CITY OF ANN ARBOR
SANITARY LANDFILL
4120 Platt Rd.

RECEIPT 398038

NAME Risk Mgt DATE

PAID BY: Cash ☐ Check ☐ Ticket ☐ Charge ☐ No Charge ☐ Other (explain) ☐

RATE: City ☐ Non-City ☐

UNITS	YARDAGE	AMOUNT
Car		
Pickup		
Truck		1 TR CYD
Appliance		24@14.00 336.00
Building Material		CHARGE TL 336.00
Trailer		#798860 C200 R01 TOP:5
City S.W.		03/23/9
City Other		
Clean Fill		

Truck No. 67 F.U.

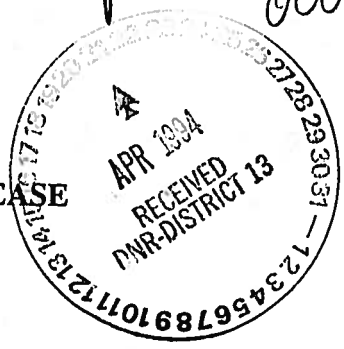
Driver [illegible]

Point of Generation: 415 W.W.

NOTICE: The City of Ann Arbor ASSUMES NO RESPONSIBILTY for damage to vehicles or personal injuries resulting from use of the Sanitary Landfill.
FOR YOUR SAFETY PLEASE USE EXTREME CARE AND CAUTION WHILE USING THE CITY'S SANITARY LANDFILL. This includes entering, exiting and while disposing of refuse. ALSO, respect all sign posting and instructions given by landfill personnel, at all times.

V-68 9/87

Facid 000842



SITE INVESTIGATION REPORT FOR AN UNDERGROUND STORAGE TANK RELEASE THE CITY OF ANN ARBOR PARKS AND RECREATION GARAGE 415 WEST WASHINGTON STREET ANN ARBOR, MICHIGAN

SITE ID NO: 810148
MUSTFA CLAIM NO: -2948

APRIL 15, 1994

Submitted to:

Michigan Department of Natural Resources
Environmental Response Division
Jackson District Office
301 East Louis Glick Highway
Jackson, Michigan 49201

Prepared for:

City of Ann Arbor
100 North Fifth Avenue
Ann Arbor, Michigan 48107

Prepared by:

The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Ann Arbor, Michigan 48108

Department of Natural Resources
DNR Environmental Response Division

REPORT COVER SHEET

Required under the authority of 1988 PA 478, as amended

INSTRUCTIONS: Complete this form with all the applicable information and submit with each report listed below as required. The Certified Underground Storage Tank Professional (CUSTP) MUST sign below. Failure to submit a report within the stated time period may result in Administrative Penalties under Section 11a. Return all completed forms to the appropriate ERD District Office listed on the back of this form.

FACILITY NAME: Parks and Recreation Garage — MUSTFA CLAIM #: 2948

ADDRESS: 415 W. Washington — MERA SITE ID #: 810148

O/O NAME: City of Ann Arbor — RELEASE DATE: 3-19-92

O/O ADDRESS: N. Fifth Ave Ann Arbor, MI — PHONE NO: 313-994-2744

CONTACT PERSON: Mr. Homayoon Pirooz — PHONE NO: 313-994-2744

REPORT SUBMITTED:

- ___ Initial Abatement (20 day)
- ___ Initial Assessment (60 day)
- ___ Soil Corrective Action Plan (75 day)
- ___ Soil Feasibility Analysis (150 day)
- ___ Phase I Hydrogeological Study (150 Day)
- ___ Soil Remediation Corrective Action Plan (210 day)
- ___ Phase II Hydrogeological Work Plan (210 day)
- ✓ Phase II Hydrogeological Study
- ___ Soil & Groundwater Feasibility Analysis
- ___ Risk Assessment and Type C Corrective Action Plan
- ___ Request for Review of Closed Loop System
- ___ Free Product
- ___ Release Closure
- ___ Soil & Groundwater Remediation Corrective Action Plan

COMPLETE FOR ALL REPORTS:

1. Free Product Present: Currently? (YES) NO If YES, total gallons recovered since last report: 40
   Previously? (YES) NO If YES, total gallons recovered to date: 40
2. Has the UST been emptied? (YES) NO
3. Site identified as a "lower priority" per Sec. 6e? YES (NO)
4. Distance from point of release to nearest municipal well supply: 1.5 miles No. of wells impacted: 0
5. Distance from point of release to nearest private well: 2.0 miles No. of wells impacted: 0
   Number of homes where drinking water is impacted: 0
6. Distance from point of release to nearest surface water/wetlands: 2 miles
7. Have vapors been identified in any confined spaces (basement, sewers, etc.)? YES (NO)
8. Estimated cost of proposed investigation or remedy: NA
   (Feasibility Studies, Corrective Action Plans and Hydrogeological Workplans ONLY)
9. What type of technology is being proposed/used as a remedy? NA
10. Since last report: Total cu. yards soil remediated: 0 Total gallons groundwater remediated: 0
11. Projected amount of time required to complete investigation or remedy: NA
12. Date(s) when on-site activities will be conducted: Already initiated product recovery

CERTIFICATION OF REPORT

I, John J. D'Addona (print CUSTP name), hereby attest to the accuracy of the statements in this document and all attachments. I certify that it was submitted to the MDNR on April 15, 1994 (date submitted).

John J D'Addona — CUSTP Signature/Date Required

[signature] 4/15/94 — QUSTC Project Manager's Signature/Date

CONSULTANT: The Traverse Group — PHONE NO: (313) 747-9300

ADDRESS: 3772 Plaza Drive Ann Arbor, MI 48108

SITE INVESTIGATION REPORT
FOR AN UNDERGROUND STORAGE TANK RELEASE
THE CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 WEST WASHINGTON STREET
ANN ARBOR, MICHIGAN

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SITE INVESTIGATION REPORT
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1.0 INTRODUCTION

The City of Ann Arbor, owner/operator of the former underground storage tank (UST) system at the Parks and Recreation Garage, 415 West Washington Street, Ann Arbor, Michigan, has retained The Traverse Group to prepare a Site Investigation Report for the confirmed release from the UST system.

This report summarizes the results of the site investigations proposed in Section 2.0 "Site Investigation Work Plan" of the *45-Day Report* which The Traverse Group submitted to the Michigan Department of Natural Resources (MDNR) on April 17, 1992.

2.0 SITE DESCRIPTION

The Parks and Recreation Garage is located south of Washington Street between First Street and Third Street in Ann Arbor, Michigan. The site security is a 6-foot chainlink fence and concrete wall around the site perimeter. The garage on the site is a U-shaped building which houses and services the vehicles and equipment used by the City of Ann Arbor Parks and Recreation Department. *Figure 1, Site Location Map*, shows the site with respect to topographic features, roads, and railroads.

Figure 2, Site Sketch, shows the site with respect to Washington Street, the adjacent railroad line and also illustrates the locations of the former USTs. The UST descriptions are summarized below:

Tank (as registered)	Size	Previous Contents
Tank #1	6,000 gallons	diesel
Tank #2	6,000 gallons	unleaded gasoline

The release that is the subject of this report emanated from the 6,000-gallon unleaded gasoline UST which previously contained fuel for the City of Ann Arbor Parks and Recreation vehicles.

3.0 SITE HISTORY

A failed tank tightness test at 9:50 a.m. on March 6, 1992, and visual evidence from the product line near the tank confirmed a release from the Tank #2 system. Tank #1 and Tank #2 were subsequently taken out of service and removed from the ground on March 20, 1992.

Initial abatement activities at the site included the removal, transportation and proper disposal of hydrocarbon-affected soil and ground water. Soil, ground water, and free product abatement measures to date are outlined in the following section.

4.0 ABATEMENT MEASURES

The abatement measures at the site to date have included the; removal, transportation, and proper disposal of 192 cubic yards (yd^3) of hydrocarbon-affected soil; removal, transportation, and proper disposal of 192 yd^3 of concrete; pumping of free product from the excavation pit; and the construction and operation of free product removal system.

4.1 Initial Abatement Measures

The excavation conducted, concurrent with UST removal activities, occurred on March 19, 20 and 23, 1992. The dimensions of the excavation are approximately 18 feet (north/south) by 32 feet (east/west) by 9 feet (depth). The hydrocarbon-affected soil was properly disposed of at the City of Ann Arbor landfill in Pittsfield Township, Michigan; and the free product and hydrocarbon-affected ground water mixture was properly disposed of at Environmental Waste Control in Inkster, Michigan. Landfill and liquid disposal manifests are included in The Traverse Group's *45-Day Report* submitted to MDNR on April 17, 1992.

On March 19, 1992, The Traverse Group's temporarily halted the tank excavation operation when gasoline-saturated soil was encountered on the south side of Tank #2; and free product began pooling. Upon the arrival of the Ann Arbor Fire Marshal, Carlo Environmental Technologies (CET) of Mt. Clemens, Michigan, incorporated 5 to 10-gallons of free product with the overburden soil. Free product did not repool, and the excavation of concrete was resumed.

On March 20, 1992, removal of the overlying concrete was completed, and excavation of the soil around the UST began. Upon removal of Tank #2, free product entered the excavation; and the local fire marshal was again contacted. The fire marshal added an emulsifier to the pooling free product and granted permission to proceed with removal of the second UST. The Traverse Group then arranged to have the free product and water pumped from the excavation by Michigan Pumping Service. Pumping continued until free product was not visible, and approximately 1,200

gallons of free product and water were pumped in 1-1/2 hours. Upon conclusion of pumping operations, additional free product continued to enter the excavation, The Traverse Group immediately conducted a free product investigation.

A total of 96 yd^3 of hydrocarbon-affected soil was removed from the site and properly disposed of at the City of Ann Arbor Landfill. Twenty-four yd^3 of concrete was removed and transported to Belleville, Michigan, for crushing.

During the weekend of March 21 and 22, free product again entered the excavation; and about 1,100 gallons of free product mixed with hydrocarbon-affected ground water was pumped by K and D on Monday, March 23. After the pumping, 96 yd^3 of excavated soil was removed from the site and properly disposed of at the City of Ann Arbor Landfill and 168 yd^3 of concrete was removed.

On March 27, 1992, The Traverse Group conducted an investigation with monitor wells to establish the extent of the free product at the site. The wells were placed near the areas where pooling free product was observed during the excavation. The purpose of the well placement was to determine the depth to the water table and the thickness and extent of the free product. Three (3) monitor wells (MW-1, MW-2, and MW-3) were installed at the locations illustrated in *Figure 2, Site Sketch*. The free product present at the site was investigated on March 30, 1992, by visually inspecting the water surface in the three monitor wells with a product thickness sampler designed by The Traverse Group. The results of the March 30, 1992, observations are shown below.

Well Identification	Product Thickness
MW-1	approximately 33 inches
MW-2	Sheen
MW-3	Sheen

Although MW-1 contained approximately 33 inches of free product, it is believed that capillary action and the removal of overburden pressures due to the open bore hole caused an elevated product thickness reading and is discussed further in the following section. Further information regarding the initial abatement measures, are included in The Traverse Group's *45 Day Report* submitted to MDNR on April 17, 1992.

4.2 Recent Abatement Measures

The results of the observed product levels in the monitor wells indicated that the best position for free product recovery would be from the area located near MW-1. MW-1 had enough free product to justify placing a nearby purge well. On April 13, 1992, the excavation was backfilled; and a purge well was constructed 8 feet southwest of MW-1.

During April and May of 1992 The Traverse Group monitored the thickness of the free product eleven times in MW-1 and in the purge well. The Traverse Group also pumped free product from these wells seven times resulting in the removal of approximately 17 gallons of free product. The free product was pumped directly from the wells with a pneumatic pump into properly labeled 55-gallon drums and stored on site awaiting proper disposal.

Additional information about the behavior of the free product at the site was compiled before installing a more permanent recovery system. Based on previous experience with free product at other sites of The Traverse Group, the ensuing free product recovery is often less than anticipated or the free product disappears.

Estimating the quantity of free product in the subsurface at the subject site was difficult due to the difference in product measurements from MW-1 and the purge well. The Traverse Group has concluded that the levels observed in the purge well are more representative of the "thickness" of the free product in the subsurface. This is the result of different construction techniques used when installing these two wells. An explanation of the differences observed in MW-1 and the purge well is based on the behavior of the ground water in the monitor well located in the unconfined aquifer. Water levels observed in that well indicate the top of the saturated zone; however, free product "floats" on the surface of the capillary fringe. The capillary fringe can be looked at as the transition between the saturated zone and the unsaturated zone but is actually considered to be part of the unsaturated zone. It contains water at a saturation greater than field capacity (water retained as film on grains and capillary size openings after drainage by gravity) and usually less than 100%, and has pore-water pressure that is less than atmospheric. Therefore, the thicker the fine grained soil strata, the thicker the capillary fringe. This occurs because abundant small-diameter pore throats represent closely packed small-diameter capillary-size openings {The American Association of Petroleum Geologists Bulletin v.77, No. 2 [February 1993], "Refined Gasoline in the Subsurface", Lyle G. Bruce, p. 212-224}. As a result, the behavior of free product on the capillary fringe accounts for the discrepancy observed regarding product levels in the two wells.

The critical difference between the two construction techniques was the selection of packing material around the well. The monitor well was packed with filter sand in a portion of the annular space, which preserved the capillary fringe immediately surrounding the well. The product thickness in this well was observed to be the result of a thicker capillary fringe and of free product percolating down the well, from the top of the capillary fringe onto the surface of the water table (static water level), and filling up the well to the surface of the capillary fringe where the free product is located. The purge well was placed in the open excavation before backfilling and was packed with 25 yd^3 of pea gravel from the bottom of the screen to within 2 feet of grade surface. Using pea gravel to pack the well eliminated the capillary zone immediately surrounding the well due to a lack of surface tension necessary to create the capillary fringe.

An automated free product removal system was installed on June 25 and 26, 1992. The system consists of a 12-inch-diameter PVC (polyvinyl chloride) purge well with a dedicated product skimmer. The skimmer rests at the water table and based on the surface tension of the liquid collects any liquid including free product from ground water. Once separated, the free product is pumped through a 6-inch-diameter PVC conduit to the aboveground tank. The tank receives product until the level indicator senses the tank is full and shuts down the system. The collected product is then properly disposed and the system is reactivated to resume collecting product. The aboveground portion of the system (the tank, pump, and miscellaneous tubing) also has a secondary containment dike to prevent a possible overfill to the surrounding area.

To date the system has been operated since June 26, 1992, and has recovered approximately 40 gallons of free product.

5.0 SITE INVESTIGATION

On June 1, 15, 16, and 17, July 6, 7, and 20, 1992, March 15 through 18, 1993 and November 10, 1993, eight (8) additional monitor wells and seventeen (17) soil borings were completed as part of the site investigation and to serve as future ground water quality monitoring points. The purpose of this investigation was to delineate the extent of the hydrocarbon-affected resources at the site, as well as to establish the site geology. The monitor wells and soil borings were placed at the locations indicated in *Figure 2, Site Sketch.* The investigation activities to date are presented in the following section.

5.1 Scope of Work

The site investigation methodology was outlined in the *45-Day Report.* The purpose of the proposed investigation was to ascertain the vertical and lateral extent of the hydrocarbon-affected soil and ground water at the site utilizing soil and water sampling and analyses, soil boring installation, monitor well installation, and surveying of the monitor wells. During an August 19, 1992, telephone conversation between a MDNR representative and personnel of the The Traverse Group, requested that vertical profiling be included as part of the soil boring activities outlined in the *45-Day Report*, Section 2.0 "Site Investigation Work Plan." The Traverse Group informed MDNR that vertical profiling of the ground water would be done by sampling ground water using a lead-screened hollow-stem auger advanced 5 feet into the aquifer with vertical profiling continuing in 10-foot intervals no further than the confining layer. MDNR approved this addition to the work plan. The following sections describe the methodology used to define the extent of hydrocarbon-affected resources at the site.

5.2 Monitor Well and Soil Boring Installation

The work plan was implemented on June 1, 1992, by installing MW-4 and MW-5 to establish ground water flow direction, gradient and quality. Monitor Well MW-1, installed on March 27, 1992, was to be one of the three wells used for the investigation. However, from the results of the observed product levels in MW-1, as described above, it is believed that the presence of free phase hydrocarbons did not allow the accurate measure of the static water level in the well. Therefore, an additional monitor well, MW-6, was installed on June 16, 1992, to replace MW-1 for the calculation of ground water flow direction and gradient. The wells were installed by Traverse Drilling, of Traverse City, Michigan, using a drill rig equipped with hollow stem augers. During installation continuous split spoon soil samples from 2 feet below grade (BG) to the soil/ground water interface were collected. The wells were constructed of a 2-inch inside-diameter galvanized steel casing with a 5-foot, #7 slot, stainless steel screen. The screens were set a minimum of 1 foot above the surface of the ground water table. MW-4 was constructed using a #7 silica filter sand placed from the bottom of the well screen to 3 feet above the screen and was grouted with a 5-foot-thick bentonite pellet seal. MW-5 was constructed using a #7 silica filter sand placed from the bottom of the well screen to 1 foot above the screen and was grouted with a 3.5-foot-thick bentonite pellet seal. MW-6 was constructed using a #7 silica filter sand placed from the bottom of the well screen to 1 foot above the screen and was grouted with a 4-foot-thick bentonite pellet seal. The remaining annular space at the three MW's were filled with concrete. The wells were capped and finished with flush mount protective steel covers set in concrete. The monitor well logs with the well construction diagrams (MW-1 through MW-6), are included in Appendix A, pages A-1 through A-6. Monitor well logs for MW-1, MW-2 and MW-3 were previously submitted to MDNR as part of the *45-Day Report*. However, there was an error with the logs, therefore the corrected logs have been included in Appendix A of this report.

In addition to the monitor well installations, soil borings were conducted to determine the extent of the hydrocarbon-affected soil and ground water. Seventeen (17) soil borings were completed at the site and tracking BTEX and PNAs concentrations in terms of location, constituents, and concentrations by soil and ground water sampling and analytical testing. On June 15 and 17, July 6, 7 and 20, and March 16 and 17, 1993, the borings were placed at the locations shown in *Figure 2, Site Sketch.*

The soil borings were completed using a drill rig equipped with hollow stem augers. All soil borings were completed by Traverse Drilling, except AH799 which was installed by CET. Boring locations were chosen along and across transects of the hydraulic gradient determined in the hydrogeologic investigation. Throughout the boring operations, additional boring locations were needed to further define the hydrocarbon-affected resources along utility lines, which were determined as a pathway for the migrating hydrocarbons, and around the perimeter of the hydrocarbon-affected area.

The amount of spacing between soil borings along a radial line and transect was based on field screening results. The borings and the soil and ground water sampling were continued until the hydrocarbon-affected resources were defined. The soil boring logs which describe the soil strata are illustrated in Appendix A, pages A-6 through A-19 and A-22 through A-24.

Two guardian monitor wells: MW-7, installed on July 20, 1992 by CET; and MW-9 installed on March 18, 1993 by Traverse Drilling, were placed to monitor the leading edge of the plume. The wells were placed along the Allen's Creek Drain. The wells were installed on opposite sides of the 12-foot storm drain on the north side of West Washington Street, across the street from the site. Monitor well locations are illustrated in *Figure 2, Site Sketch.*

The Traverse Group attempted to place additional soil borings within the building in the northwest direction downgradient of the source area. However, due to low clearance inside the building the borings could not be placed with the drill rig that was on-site. These borings were completed at a later date as described below.

Monitor wells MW-7 and MW-9 were constructed in the same manner as MW-5, outlined above, with the exception of their backfill installation and grouting procedure. A #7 silica filter sand was placed from the bottom of the well screen in MW-7 to 1 foot above the screen and was grouted with a 7-foot-thick bentonite pellet seal to within 1.0 foot of grade level. A #7 silica filter sand was placed from the bottom of the well screen in MW-9 to 3.5 feet above the screen and was grouted with a 1-foot-thick bentonite pellet seal followed by a 3.5-foot-thick cement and bentonite powder slurry seal to within 1.0 foot of grade level. The remaining annular space was filled with concrete. Well screen placement for both wells was based on the depth where the ground water table was encountered and screened 1 foot above the ground water table. MW-7 and MW-9 were capped and finished with flush mount protective steel covers set in concrete.

A vertical profile monitor well MW-8 was installed near MW-6 on March 15, 1993 by Traverse Drilling, to monitor the vertical migration of the hydrocarbon-affected ground water. MW-8 is also illustrated in *Figure 2, Site Sketch.* The vertical profile monitor well MW-8 was constructed in the same manner as MW-6 with the exception of its backfill installation and grouting procedure. Native sand was placed from the bottom of the well screen in MW-8 to 7 feet above the screen and was grouted with a 2-foot-thick bentonite pellet seal followed by a 4-foot-thick cement and bentonite powder slurry seal followed by a 1-foot-thick bentonite pellet seal to within 1.0 foot of grade level. The remaining annular space was filled with concrete. Top of well screen placement for MW-8 was based on the depth where MW-6 was placed, 5 feet below the screen bottom of MW-6. MW-8 was capped and finished with a flush mount protective steel cover set in concrete. The monitor well logs with the well construction diagrams (MW-7, MW-8, and MW-9), are included in Appendix A, pages A-20, A-21, and A-25.

Two additional monitor wells: MW-10 and MW-11, installed on November 10, 1993 by CET, were placed to further monitor the plume. Monitor well locations are illustrated in *Figure 2, Site Sketch.*

Monitor wells MW-10 and MW-11 were constructed in the same manner as MW-5, outlined above, with the exception of their backfill installation and grouting procedure. A #7 silica filter sand was placed from the bottom of the well screen in MW-10 to 1 foot above the screen and was grouted with a 1-foot-thick bentonite pellet seal to within 1.0 feet of grade level. A #7 silica filter sand was placed from the bottom of the well screen in MW-11 to 1 foot above the screen and was grouted with a 1.5-foot-thick bentonite pellet seal to within 2 feet of grade level. The remaining annular space was filled with concrete. Well screen placement for both wells was based on the depth where the ground water table was encountered and screened 1 foot above the ground water table. MW-10 and MW-11 were capped and finished with flush mount protective steel covers set in concrete.

Augers, well construction materials, and sampling equipment were steam cleaned before use to prevent potential cross-contamination. The soil cuttings created from the placement of the monitor wells and soil borings were accumulated in 55-gallon barrels, properly labeled, and stored on the subject site awaiting proper disposal.

After placement, the monitor wells were developed according to industry standards using a hand bailer. Approximately 20 gallons of ground water were purged during the development process of MW-4, 25 gallons from MW-5, and 20 gallons from MW-6. Approximately 103 gallons of ground water was purged during the development process of the MW-7, MW-8, and MW-9. Approximately 20 gallons of ground water was purged during the development process of MW-10, and MW-11. The purged ground water was accumulated in 55-gallon barrels, properly labeled, and stored on the site awaiting proper disposal.

5.3 Soil Sampling

Soil samples were continuously collected from 2 feet BG to the soil/ground water interface utilizing a split spoon sampling device. However, due to various fill materials in the immediate sub-surface at many of the soil boring locations, continuous split spoon soil samples were difficult to obtain from 2 feet BG. The sampling intervals for each boring are summarized in the boring logs included in Appendix A. Split spoon soil samples were field-screened using an Organic Vapor Meter (OVM) equipped with a Photo-ionization dectecter (PID). The soil samples with the highest PID readings from each boring were sent to the analytical laboratory. If all soil samples from a soil boring produced a zero reading on the PID, then the soil sample collected at the capillary zone was submitted for analysis. Additional samples were also collected for the analytical laboratory depending on soil strata and depth below grade.

The soil samples were accumulated in sterile sample jars supplied by the analytical laboratory and stored on ice in a cooler for transportation to the analytical laboratory. Soil samples were sent to Environmental Quality Laboratories, Inc. (EQL) of Sterling Heights, Michigan and Traverse Analytical Laboratory of Traverse City, Michigan, for laboratory analyses of BTEX and PNAs. However, soil samples from AH-1, AH-2, AH-3, AH17-1, AH17-2, AH17-3, AH17-4 and AH17-5 were delivered immediately to an on-site mobile laboratory operated by EQL for analyses of BTEX and PNAs. Standard chain of custody procedures were followed.

5.4 Ground Water Sampling

Ground water was sampled during the monitor well and soil boring installations using a lead-screened hollow-stem auger advanced into the aquifer 5 feet with vertical profiling continuing in 10-foot intervals until head space analyses from the water samples demonstrated decreasing OVM readings. The samples were collected using a stainless steel bailer inserted down the center of the auger flight to the sampling interval. The lead-screened hollow-stem auger is a field-screening tool used to vertically sample ground water in the uppermost water bearing zone.

Vertical profiling of the aquifer in discrete sampling intervals was to be continued to the confining layer; however, at an upgradient location from the source area, soil boring AH799 did not encounter a confining layer up to 84 feet BG. Therefore, the additional soil borings placed after AH799 were vertically profiled to various depths BG until head space analyses from the water samples demonstrated decreasing OVM readings determined by the on-site engineer. The sampling intervals for each boring are summarized in the boring logs included in Appendix A. Before collection of the ground water samples, two auger flight volumes of ground water were purged. The purged ground water was accumulated in 55-gallon barrels, properly labeled, and stored on the site awaiting proper disposal.

The ground water samples were accumulated in sterile sample jars supplied by the analytical laboratory and placed on ice in a cooler for transportation to the analytical laboratory. Ground water samples were sent to EQL and Traverse Analytical Laboratory for laboratory analyses of BTEX and PNAs. However, ground water samples from AH-1, AH-2, AH-3, AH17-1, AH17-2, AH17-3, AH17-4 and AH17-5 were delivered immediately to the on-site mobile laboratory operated by EQL for analyses of BTEX and PNAs. Standard chain of custody procedures were followed.

5.5 Ground Water Monitor Well Sampling

Three well volumes of ground water were purged from MW-1, MW-4 and MW-5 on June 5, 1992, three well volumes from MW-6 on March 3, 1993, three well volumes from MW-7, MW-8, and MW-9 on March 25, 1993, and three well volumes from MW-10 and MW-11 on November 10, 1993. The purged ground water was accumulated in 55-gallon barrels, properly labeled, and stored

on the site awaiting proper disposal. Ground water samples were collected from the wells immediately following purging using a stainless steel hand bailer.

The ground water samples were accumulated in sterile sample jars supplied by the analytical laboratory and placed on ice in a cooler for transportation to the analytical laboratory. Ground water samples from MW-1, MW-4 and MW-5 were submitted to EQL for laboratory analyses of BTEX, PNAs, and dissolved lead, while the ground water samples from MW-6, MW-7, MW-8, MW-9, MW-10, and MW-11 were submitted to Traverse Analytical Laboratory for laboratory analyses of BTEX and PNAs, to determine ground water quality. Standard chain of custody procedures were followed.

5.6 Soil and Liquid Disposal

Upon completion of the site investigation, soil waste and waste water generated and accumulated during the site investigation were properly disposed. Soil and liquid disposed manifests are included in Appendix C.

5.7 Sample Analyses

The soil and ground water samples immediately submitted to the on-site EQL mobile laboratory and the soil and ground water samples submitted to EQL and Traverse Analytical Laboratory were analyzed for BTEX and PNAs. Ground water samples from MW-1, MW-4 and MW-5 were submitted to EQL for laboratory analyses of BTEX, PNAs and dissolved Lead.

Soil and ground water analyses were performed using Method 8020 for BTEX, Method 8310 for PNAs, and Method 7421/furnace for total lead as outlined in the document *MDNR MERA Operational Memorandum #6 Revision 1 dated April 22, 1992: Analytical Detection Level Guidance for Environmental Contamination Response Activities under Act 307 Rules, Tables 1 and 2a.*

6.0 RESULTS

6.1 Soil and Ground Water Analytical Data

A total of 31 soil samples and 43 ground water samples were analyzed by the analytical laboratories. A summary of the soil and ground water sampling results is included in *Table 1.* Analytical reports of soil and ground water samples collected, quality control reports, and the document chain-of-custodies are included in Appendix B.

6.1.1 Soil Analytical Data

The concentrations of analyzed BTEX and PNAs in soil samples were below detection limits in most samples collected, with the exception of samples collected from AH-1, AH-2, AH-3, AH-4, AH17-1, AH17-2, MW-8, MW-9 and MW-10.

Soil samples collected from AH-1 and MW-8, the former dispenser area, contained elevated levels of BTEX and PNAs. The sample collected from AH-1 at 4 to 6 feet BG contained a BTEX concentration of 12,361 ppb and a PNAs concentration of 16,900 ppb. The sample collected from MW-8 at 6 to 8 feet BG contained a BTEX concentration of 263,100 ppb and no concentrations of PNAs.

Soil samples collected from AH-2, AH-3, AH-4, MW-9, and MW-10 along underground utility lines, contained elevated levels of BTEX. Two soil samples collected from AH-4, along a sanitary sewer line, contained BTEX concentrations of 17,590 ppb at 6 to 8 feet BG and 64,500 ppb at 8 to 10 feet BG. The sample collected from AH-3 at 6 to 8 feet BG along the east side of Allen's Creek Drain contained a BTEX concentration of 4,040 ppb and is below Type B criteria. The sample collected from AH-2 at 6 to 8 feet BG along the west side of Allen's Creek Drain contained a BTEX concentration of 264 ppb and is below Type B criteria. The sample collected from MW-9 at 8 to 10 feet BG along the east side of Allen's Creek Drain north side of Washington Street contained a BTEX concentration of 220 ppb and is below Type B criteria. The sample collected from MW-10 at 5 to 7 feet BG along a storm drain on the west side of Allen's Creek Drain contained a BTEX concentration of 18,060 ppb.

Soil samples collected from AH17-1 and AH17-2, areas not related to the UST source of hydrocarbon-affected soil, contained elevated levels of PNAs. Two soil samples collected from AH17-1 contained PNAs concentrations of 930 ppb at 2 to 4 feet BG below Type B criteria and 1,500 ppb at 4 to 6 feet BG below Type B criteria. The sample collected from AH17-2 at 2 to 4 feet BG contained a PNAs concentration of 7,390 ppb.

6.1.2 Ground Water Analytical Data

The concentrations of analyzed BTEX and PNAs in the ground water were above detection limits in most samples collected. Based on the number of samples that contained detectable concentrations of hydrocarbons, only a few sample results will be reported in greater detail.

The source area monitor well, MW-1, had a sample collected from 8 to 10 feet BG and contained a BTEX concentration of 62,600 ppb and a PNAs concentration of 9,098 ppb. MW-1 contained the highest concentrations of BTEX and PNAs out of all the ground water samples analyzed. MW-10 contained free product and thus was not sampled.

The ground water samples collected from AH-4, along a sanitary sewer line, contained detectable concentrations of BTEX and PNAs-affected ground water. Vertical profile water samples indicated BTEX concentrations ranging from 4,800 ppb at 10 to 15 feet BG to 26 ppb at 50 to 55 feet BG, and PNAs concentrations ranging from 1,793 ppb at 10 to 15 feet BG to non-detect at 30 to 35 feet BG. However, the analytical results (*Table 1*) establish the vertical extent of the hydrocarbon-affected ground water to be limited to 30 feet BG. The intervals sampled below 30 feet BG fluctuate and do not show consistently decreasing values that are a characteristic of a light nonaqueous phase liquid. There is no evidence or reason to suspect these hydrocarbons at these deeper intervals. Based on these facts it is believed that soils may have adhered to the screened auger and were carried down to the deeper sampling intervals, affecting the ground water as it passed over the soil on its way through the screen, thereby affecting the ground water samples collected for analyses.

The ground water samples collected during the installation of MW-8, located in the former dispenser area, contained detectable concentrations of BTEX and PNAs-affected ground water. Vertical profile water samples indicated BTEX concentrations ranging from 2,989 ppb at 8 to 13 feet BG to 604 ppb at 28 to 33 feet BG, and PNAs concentrations ranging from 1,569 ppb at 8 to 13 feet BG to 119 ppb at 28 to 33 feet BG. An additional ground water sample collected at a later date from MW-8 at it's screened interval 15 to 20 feet BG contained a BTEX concentration of 14 ppb and is below Type B criteria and no concentrations of PNAs. Therefore, it is believed that soils may have adhered to the screened auger during the installation of MW-8 and were carried down to the deeper sampling intervals, affecting the ground water as it passed over the soil on its way through the screen, thereby affecting the ground water samples collected for analyses. The monitor well screened interval (15 to 20 feet BG) more accurately establishes the vertical distribution of PNAs-affected ground water at the MW-8 location.

Ground water samples collected from AH-2 and AH-3 along the west and east side of the Allen's Creek Drain, respectively, contained elevated levels of BTEX and PNAs. The ground water sample collected from AH-2 at 8 feet BG contained a BTEX concentration of 127.2 ppb and a PNAs concentration of 1,461 ppb. The ground water sample collected from AH-3 at 12 feet BG contained a BTEX concentration of 22.4 ppb and no concentration of PNAs.

6.2 Site Hydrogeology

Based on the continuous subsurface split spoon soil sampling during the installations of the monitor wells and soil borings, the general subsurface soil conditions across the hydrocarbon-affected soil and ground water at the site appeared as follows:

The general soil lithology can be summarized as:

0 to 0.5 foot BG - asphalt/concrete
0.5 to 4 feet BG - mixed sand, stone, clay, cinder, and brick debris
4 to 7 feet BG - fine to medium silty brown sand
7 to 8 feet - moist, organics, black peat
8 to 46 feet BG - wet, fine to coarse brown sand

The water table lies at approximately 5.5 to 8 feet BG across the site. Static ground water table data are discussed in Section 7.0.

The monitor well logs and soil boring logs, describing the subsurface soil strata in greater detail, are included in Appendix A.

The site lies in a 100 year flood plain within the Allen's Creek Drainage Basin. The main branch of Allen's Creek enters the site from the south heading north, turns northwest, then again turns toward the north in the middle of the site near the former storage shed, illustrated in *Figure 2, Site Sketch.* In 1929 Allen's Creek permanently became Allen's Creek Drain and was enclosed in underground cement conduits as part of the city's storm sewer system.

Figure 3, Hydrogeologic Cross Section, illustrates a southwest-northeast cross section, constructed along the line shown in *Figure 2, Site Sketch.*

Native soils over the site are 6 to 8 feet BG and are primarily black organics. It is believed at one time back swamps or marshy areas were along the creek. Over time, organics accumulated creating the rich black organics found at the site. Below the soil lithology sand with gravel extends to depths of more than 46 feet BG across the site. A well-cemented sand unit or hardpan was encountered at 46 feet BG in the northern portion of the site (AH-5). However, this hardpan was not encountered in the southern portion of the site (AH799) within 84 feet BG.

The average hydraulic conductivity of the aquifer materials as determined by slug tests performed in MW-5, MW-6, MW-7, and MW-8, is 8.23×10^{-7} ft/sec (equivalent to 0.07 ft/day). Based on the average hydraulic conductivity value, the ground water gradients, and an estimated sediment porosity of 0.35, the average ground water velocity is 0.11 ft/yr. The ground water velocity was calculated using the formula $\upsilon = KI/\eta$, where υ is the average linear velocity, K is the hydraulic conductivity, I is the hydraulic gradient, and η is the porosity (Groundwater, Freeze and Cheery, 1979).

7.0 DISCUSSION OF SITE INVESTIGATION DATA

Soil and ground water non-detect boundaries were nearly established horizontally and vertically. Based on the results of the site investigation data, ground water contour maps as well as soil and ground water concentration contour maps were developed to illustrate the results.

- *Figure 4, Site Sketches with Ground Water Contours*, illustrates the ground water flow directions and gradients for three monitoring periods. Static ground water table data measured to the nearest 0.01 foot BTOC, along with spatial locations and top of casing elevations from the survey were used to calculate ground water flow directions and gradients. All monitor wells with the exception of MW-10 and MW-11 were surveyed by a registered surveyor to determine spatial locations to the nearest 0.1 foot and top of casing elevations correlated with United States Geological Survey (USGS) benchmark datum to the nearest 0.01 foot. Three monitor wells were used to establish the piezometric surfaces, based on their respective screened intervals BG in relation to the ground water table. Free product monitor wells MW-2 and MW-3 constructed of 2-inch schedule 40 PVC screen and riser were not used in the calculation. Free product present in MW-1 and MW-10 did not allow the wells to be used in the calculation and MW-4 was unable to be located during the last two monitoring events. MW-8 is a vertical profiling monitor well screened below the water table near MW-6 and was thus not used in the calculation. MW-9, located on the east side of the Allen's Creek Drain, was not used in the calculation because of the potential for conflicting water table data. Static ground water levels and top of casing elevations are summarized in the tables in *Figure 4*. A complete summary to date of the static ground water monitoring results is included in *Table 2*.

Ground Water Flow Data

Date	Wells Measured	Ground Water Flow Direction	Hydraulic Gradient (ft/ft)
7-1-92	MW-4, MW-5, MW-6	N75°22'W	.0022
5-14-93	MW-5, MW-6, MW-7	N13°49'W	.00141
7-13-93	MW-5, MW-6, MW-7	N11°28'W	.00141

Ground water flow data from May 14, 1993, is consistent with data obtained from July 13, 1993, as shown above. Static water levels were also collected on August 23, 1993. However, based on the low hydraulic gradient and past static water level elevations observed at the site, the August 23, 1993, data was inconsistent with July 1, 1992, data specifically with regard to static water levels at MW-5. Therefore, additional static water levels will need to collected for the set of wells from that event.

- *Figure 5, Allen's Creek Drainage Sketch*, identifies the locations of the Allen's Creek tributaries and drainage basin in relation to this site. Allen's Creek drains more than five square miles of central and western Ann Arbor. In 1926 Allen's Creek permanently became Allen's Creek Drain, a part of the city's permanent storm sewer system. The creek is enclosed in underground cement conduits to control the drainage from the creek's watershed. The main section of the conduits cuts across the 415 W. Washington property and is approximately 12 feet in diameter. Although the drain runs low most of the time, at times it is at capacity. There may be several hydraulic connections between the drain and ground water flow in the aquifer. However, it is not known at this time how the Allen's Creek Drain affects ground water flow but it appears that ground water flow does flow away from the drain on this site based on the three previous data sets. Thus, The Traverse Group recommends a monthly static ground water monitoring program to determine ground water flow direction.

- *Figure 6, Soil BTEX Concentration Contours (6'-8' Below Grade)*, illustrates the lateral profile of BTEX concentrations at 6 to 8 feet below grade. Based on the analytical data there appears to be one significant point source, the former UST, relating to BTEX in the soil. Additional data points are needed downgradient from the source area because AH-4 is at 17,590 ppb and therefore the lateral extent of BTEX-affected soils has not been delineated in the northwest direction. This can be addressed during the design of remediation systems.

- *Figure 7, Ground Water BTEX Concentration Contours (8'-13' Below Grade)*, illustrates the lateral profile of BTEX concentrations in the ground water. The initial ground water monitoring was conducted by using a lead screened hollow stem auger which nearly established the lateral extent and established the vertical extent of the hydrocarbon-affected ground water.

MW-7 and MW-9 were placed along both sides of the Allen's Creek Drain on the north side of W. Washington street in the right of way to monitor the Allen's Creek Drain which is a potential migration pathway. The purpose of these guardian wells is to monitor the potential migration of the hydrocarbon-affected ground water.

Downgradient from the source area BTEX levels at MW-1 are 62,600 ppb requiring additional delineation as part of the design and installation of the ground water treatment systems.

- *Figure 8, Soil PNAs Concentration Contours (4'-6' Below Grade)*, illustrates the lateral profile of PNAs concentrations at 4 to 6 feet below grade. Based on the analytical data there appears to be three isolated point sources relating to PNAs in the soil at AH17-2, AH17-1 (below Type B criteria) and AH-1 (near the former fuel dispensers). AH17-1 and AH17-2 point sources are unrelated to the former UST.

- *Figure 9, Ground Water PNAs Concentration Contours (8'-13' Below Grade)*, illustrates the lateral profile of PNAs concentrations in the ground water. The initial ground water monitoring was conducted by using a lead screened hollow stem auger which established the lateral extent and nearly established the vertical extent of the hydrocarbon-affected ground water.

  As described for *Figure 7* above, MW-7 and MW-9 were placed along both sides of the Allen's Creek Drain on the north side of W. Washington Street in the right of way.

  The lateral extent of PNAs-affected ground water has been delineated.

- The largest vertical distribution of the BTEX-affected soil and ground water has been established near AH-4 as being limited to 10 feet BG in the soil and 30 feet BG in the ground water. Based on the results discussed in Section 6.1.2 it is believed that soils may have adhered to the screened auger and affected the ground water samples collected for analyses at intervals below 30 feet BG.

  The vertical distribution of the PNAs-affected soils has not yet been determined to areas around AH17-2 and AH17-1 (levels below Type B criteria). However, based on the results that these are isolated point sources and the fact that ground water is not affected at theses areas it is estimated that the vertical distribution is limited. The largest vertical distribution of PNAs-affected ground water has been established near MW-8 as being limited to 15 feet BG in the ground water. Based on the results discussed in Section 6.1.2 it is believed that soils may have adhered to the screened auger and affected the ground water samples collected for analyses at intervals below 15 feet BG. The monitor well screened interval (15 to 20 feet BG) more accurately establishes the vertical distribution of PNAs-affected ground water at the MW-8 location.

8.0 RECOMMENDATIONS

Based upon the results of the site investigation activities conducted to date, the vertical limits of affected soil and ground water at the site have been defined, and additional site investigation to be incorporated in the remediation phase is recommended to further delineate the hydrocarbon-affected soil and ground water in the northwest direction. The former release source has been removed, the extent of affected soil near the former UST has been removed. Additionally, the low ground water velocity serves to limit the spread of contaminants off-site.

Based on the above observations, The Traverse Group recommends that the additional site investigation be completed in the northwest direction downgradient of the source area, the free product recovery system continue operating, that the ground water table be depressed to enhance the removal of free product as an interim corrective action measure, that a monthly static ground water monitoring program be implemented, that a quarterly ground water monitoring program be initiated until corrective action measures take place, and that a feasibility study be conducted on potential soil and ground water cleanup technologies upon further investigative results.

8.1 Free Product Removal

The free product removal efforts to date have included only the passive skimming of hydrocarbons from the present product recovery well. As an initial corrective action measure it is recommended that an active free product removal program be implemented to accelerate the removal of free product as well a emulsified free product from the subsurface. An active system would involve pumping both product and water out of a product recovery well to create a depressed ground water table. This depression creates a cone of influence in the area surrounding the recovery well which funnels the remaining trapped free product to the recovery well where it is collected and subsequently separated into oil and water.

An air driven submersible water and product pump will be installed in the present recovery well. The water and product mixture collected would then be passed through a coalescing oil/water separator to remove the trapped product from the mixture. Coalescing oil/water separators are specifically designed to remove free product as well as emulsified product. The remaining water, with an agreement with the city sanitary authority, could be discharged to the sewer. An evaluation of the present recovery well will be performed to determine if the present construction is sufficient for an active recovery program. It may be necessary to install a different recovery well if the well packing material or the size of the well is insufficient.

The active free product removal system will be operated until there is no measurable oil and grease in the influent to oil/water separator. The city sanitary authority may require oil and grease measurements of the effluent as well, before the water is discharged to the sewer. Sampling for oil and grease on the influent and possibly the effluent will be performed with the quarterly monitor well sampling, unless the city requires sampling of the effluent more frequently.

8.2 Static Ground Water Monitoring Program

A monthly static ground water monitoring program utilizing the current monitor well network (MW-1 through MW-11) at the site is recommended to determine ground water flow direction. Seasonal changes would be observed and reported to MDNR. The monitoring program proposed by The Traverse Group will be on a monthly basis for a period of one year. The primary objective of the program is to determine whether or not seasonal ground water flow direction variations exist and the impact from the Allen's Creek Drain.

8.3 Ground Water Monitoring Program

A monitoring program at the site is recommended in order to track the dissolved hydrocarbon plumes. Monitor wells MW-1 through MW-11 will be included in the monitoring program. The monitoring program proposed by The Traverse Group will be on a quarterly basis for a period of one year. The primary objective of the program is to determine whether the dissolved hydrocarbon plume is migrating to previously unaffected areas, with secondary objectives of determining whether seasonal ground water flow direction variations exist, and whether plume migration rate is dependent on ground water table fluctuations. The quarterly monitoring program may be modified at a later date based on the results of the first year of sampling and analyses.

TABLE 1

Soil and Ground Water Sampling Results

Sample ID	Date	Matrix	Depth Below Grade (feet)	Benzene♦ (ppb)	Toluene♦ (ppb)	Ethyl-Benzene♦ (ppb)	Xylenes♦ (ppb)	Total BTEX (ppb)	Total PNAs (ppb)	Lead (ppb)
MW-4	01-Jun-92	Soil	08'-10'	ND	ND	ND	ND	ND	ND ■	700•
MW-5	01-Jun-92	Soil	04'-06'	ND	ND	ND	ND	ND	ND ■	1,500•
MW-5	01-Jun-92	Soil	06'-08'	ND	ND	ND	ND	ND	ND ■	1,100•
MW-1	05-Jun-92	Water	08'-10'	14,000	21,000	2,600	25,000	62,600	9,098 ♦	4.5°
MW-4	05-Jun-92	Water	08'-10'	ND	ND	ND	ND	ND	ND ♦	3.4°
MW-5	05-Jun-92	Water	06'-08'	ND	ND	ND	ND	ND	ND ♦	ND°
AH-1	15-Jun-92	Soil	04'-06'	255	2,727	279 ♦	9,100	12,361	16,900 ■	NS
AH-1	15-Jun-92	Water	10'-12'	9.2	63.3	12.7	219	304.2	139.7 ♦	NS
AH-2	15-Jun-92	Soil	06'-08'	ND	48	ND	216	264	ND ■	NS

ppb Parts per billion: = µg/kg (microgram per kilogram) for soil
= µg/L (micrograms per liter) for water
BTEX Benzene, Toluene, Ethyl-benzene and Xylenes
PNAs Polynuclear Aromatics
NS Not Sampled
ND (Non-Detect) Indicates Results Below Detection Limits
♦ Value shown is higher than aesthetic drinking water value but lower than health based drinking water value

Above Type B Criteria

Detection Limits:

♦	BTEX (per constituent)	Soil:	< 10.0 ppb
		Water:	< 1.0 ppb
■	PNAs (per constituent)	Soil:	< 300.0 ppb
◂	PNAs (per constituent)	Soil:	< 330.0 ppb
♣	PNAs (per constituent)	Water:	< 5.0 ppb
•	Lead, total	Soil:	< 100.0 ppb
o	Lead, dissolved	Water:	< 2.0 ppb

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Sample ID	Date	Matrix	Depth Below Grade (feet)	Benzene♦ (ppb)	Toluene♦ (ppb)	Ethyl-Benzene♦ (ppb)	Xylenes♦ (ppb)	Total BTEX (ppb)	Total PNAs (ppb)	Lead (ppb)
AH-2	15-Jun-92	Water	07'-08'	12.6	26.4	4.7	83.5	127.2	1,461 ♠	NS
AH-3	15-Jun-92	Soil	06'-08'	ND	740	ND	3,300	4,040	ND ■	NS
AH-3	15-Jun-92	Water	07'-12'	2.5	7.9	ND	12	22.4	ND ♠	NS
AH17-1	17-Jun-92	Soil	02'-04'	ND	ND	ND	ND	ND	930 ■	NS
AH17-1	17-Jun-92	Soil	04'-06'	ND	ND	ND	ND	ND	1,500 ■	NS
AH17-1	17-Jun-92	Soil	06'-08'	ND	ND	ND	ND	ND	ND ■	NS
AH17-1	17-Jun-92	Water	10'	ND	ND	ND	ND	ND	ND ♠	NS
AH17-2	17-Jun-92	Soil	02'-04'	ND	ND	ND	ND	ND	7,390 ■	NS
AH17-2	17-Jun-92	Soil	04'-06'	ND	ND	ND	ND	ND	ND ■	NS
AH17-2	17-Jun-92	Soil	06'-08'	ND	ND	ND	ND	ND	ND ■	NS

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◄	PNAs (per constituent)	Soil:	< 330.0 ppb
♠	PNAs (per constituent)	Water:	< 5.0 ppb
•	Lead, total	Soil:	< 100.0 ppb
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AH17-2	17-Jun-92	Water	10'	1.4	3.6	ND	5.9	10.9	ND ♠	NS
AH17-3	17-Jun-92	Soil	06'-08'	ND	ND	ND	ND	ND	ND ■	NS
AH17-3	17-Jun-92	Water	10'	ND	ND	ND	ND	ND	ND ♠	NS
AH17-4	17-Jun-92	Soil	02'-04'	ND	ND	ND	ND	ND	ND ■	NS
AH17-4	17-Jun-92	Soil	04'-06'	ND	ND	ND	ND	ND	ND ■	NS
AH17-4	17-Jun-92	Water	10'	ND	ND	ND	ND	ND	ND ♠	NS
AH17-5	17-Jun-92	Soil	02'-04'	ND	ND	ND	ND	ND	ND ■	NS
AH17-5	17-Jun-92	Soil	04'-06'	ND	ND	ND	ND	ND	ND ■	NS
AH17-5	17-Jun-92	Water	10'	ND	ND	ND	ND	ND	ND ♠	NS
AH761	06-Jul-92	Soil	06'-08'	ND	ND	ND	ND	ND	ND ◂	NS

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PNAs Polynuclear Aromatics

NS Not Sampled

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♠ Value shown is higher than aesthetic drinking water value but lower than health based drinking water value

Above Type B Criteria

Detection Limits:

♦	BTEX (per constituent)	Soil: < 10.0 ppb Water: < 1.0 ppb
■	PNAs (per constituent)	Soil: < 300.0 ppb
◂	PNAs (per constituent)	Soil: < 330.0 ppb
♠	PNAs (per constituent)	Water: < 5.0 ppb
•	Lead, total	Soil: < 100.0 ppb
o	Lead, dissolved	Water: < 2.0 ppb

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Soil and Ground Water Sampling Results

Sample ID	Date	Matrix	Depth Below Grade (feet)	Benzene♦ (ppb)	Toluene♦ (ppb)	Ethyl-Benzene♦ (ppb)	Xylenes♦ (ppb)	Total BTEX (ppb)	Total PNAs (ppb)	Lead (ppb)
AH761	06-Jul-92	Water	10'-12'	ND	ND	ND	ND	ND	ND ♦	NS
AH762	06-Jul-92	Soil	06'-08'	ND	ND	ND	ND	ND	ND ◂	NS
AH762	06-Jul-92	Water	10'-12'	ND	ND	4.2	92	96.2	24.1 ♦	NS
AH763	06-Jul-92	Soil	06'-08'	ND	ND	ND	ND	ND	ND ◂	NS
AH763	06-Jul-92	Water	09'	ND	ND	ND	1.9	1.9	ND ♦	NS
AH771	07-Jul-92	Soil	06'-08'	ND	ND	ND	ND	ND	ND ◂	NS
AH771	07-Jul-92	Water	08'-10'	7.6	ND	ND	3.4	11	ND ♦	NS
AH772	07-Jul-92	Soil	06'-08'	ND	ND	ND	ND	ND	ND ◂	NS
AH772	07-Jul-92	Water	08'-10'	ND	ND	ND	ND	ND	ND ♦	NS

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■	PNAs (per constituent)	Soil: < 300.0 ppb
◂	PNAs (per constituent)	Soil: < 330.0 ppb
♣	PNAs (per constituent)	Water: < 5.0 ppb
•	Lead, total	Soil: < 100.0 ppb
o	Lead, dissolved	Water: < 2.0 ppb

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TRIP	07-Jul-92	Water	None	ND	ND	ND	ND	ND	NS	NS
MW-7	20-Jul-92	Soil	9.5'-11.5'	ND	ND	ND	ND	ND	ND■	NS
MW-7	20-Jul-92	Water	10'-12'	ND	ND	ND	ND	ND	ND ♦	NS
MW-02	03-Mar-93	Water	08'-13'	ND	ND	ND	1	1	ND ♦	NS
MW-03	03-Mar-93	Water	07'-12'	ND	5	ND	ND	5	97 ♦	NS
MW-06	03-Mar-93	Water	06'-10'	79	51	270 ♦	1,100 ♦	1,500	305 ♦	NS
TRIP	03-Mar-93	Water	None	ND	ND	ND	ND	ND	NS	NS
MW-08	15-Mar-93	Soil	06'-08'	6,100	15,000	31,000	211,000	263,100	ND ◂	NS
MW-08	15-Mar-93	Water	08'-13'	89	460	240 ♦	2,200 ♦	2,989	1,569 ♦	NS

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♣	PNAs (per constituent)	Water:	< 5.0 ppb
•	Lead, total	Soil:	< 100.0 ppb
○	Lead, dissolved	Water:	< 2.0 ppb

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MW-08	15-Mar-93	Water	18'-23'	37	119	401 ♦	732 ♦	1,289	102 ♦	NS
MW-08	15-Mar-93	Water	28'-33'	23	96	33	452 ♦	604	119 ♦	NS
TRIP	15-Mar-93	Water	None	ND	ND	ND	ND	ND	ND ♦	NS
AH-04	16-Mar-93	Soil	06'-08'	490	2,500	2,300	12,300	17,590	ND ♦	NS
AH-04	16-Mar-93	Soil	08'-10'	3,800	7,700	14,000	39,000	64,500	ND ♦	NS
AH-04	16-Mar-93	Water	10'-15'	1,200	520	880	2,200 ♦	4,800	1,793 ♦	NS
AH-04	16-Mar-93	Water	20'-25'	970	250	370 ♦	960 ♦	2,550	667 ♦	NS
AH-04	16-Mar-93	Water	30'-35'	31	15	34	94	174	ND ♦	NS
AH-04	16-Mar-93	Water	40'-45'	22	17	44	130	213	ND ♦	NS
AH-04	16-Mar-93	Water	50'-55'	3	2	6	15	26	ND ♦	NS

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◄	PNAs (per constituent)	Soil: < 330.0 ppb
♣	PNAs (per constituent)	Water: < 5.0 ppb
•	Lead, total	Soil: < 100.0 ppb
o	Lead, dissolved	Water: < 2.0 ppb

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Soil and Ground Water Sampling Results

Sample ID	Date	Matrix	Depth Below Grade (feet)	Benzene♦ (ppb)	Toluene♦ (ppb)	Ethyl-Benzene♦ (ppb)	Xylenes♦ (ppb)	Total BTEX (ppb)	Total PNAs (ppb)	Lead (ppb)
TRIP	16-Mar-93	Water	None	ND	ND	ND	ND	ND	ND ♠	NS
AH-05	17-Mar-93	Water	10'-15'	ND	ND	ND	ND	ND	ND ♠	NS
AH-05	17-Mar-93	Water	20'-25'	ND	ND	ND	ND	ND	ND ♠	NS
AH-05	17-Mar-93	Water	30'-35'	ND	ND	ND	ND	ND	ND ♠	NS
AH-05	17-Mar-93	Water	40'-45'	ND	ND	ND	ND	ND	ND ♠	NS
AH-06	17-Mar-93	Soil	04'-06'	ND	ND	ND	ND	ND	ND ◂	NS
AH-06	17-Mar-93	Soil	06'-08'	ND	ND	ND	ND	ND	ND ◂	NS
AH-06	17-Mar-93	Water	08'-13'	ND	ND	ND	ND	ND	ND ♠	NS
AH-06	17-Mar-93	Water	18'-23'	ND	ND	ND	ND	ND	ND ♠	NS
AH-06	17-Mar-93	Water	28'-33'	ND	1	ND	ND	1	ND ♠	NS

ppb Parts per billion: = µg/kg (microgram per kilogram) for soil
= µg/L (micrograms per liter) for water
BTEX Benzene, Toluene, Ethyl-benzene and Xylenes
PNAs Polynuclear Aromatics
NS Not Sampled
ND (Non-Detect) Indicates Results Below Detection Limits
♠ Value shown is higher than aesthetic drinking water value but lower than health based drinking water value

Above Type B Criteria

Detection Limits:

♦	BTEX (per constituent)	Soil: < 10.0 ppb Water: < 1.0 ppb
■	PNAs (per constituent)	Soil: < 300.0 ppb
◂	PNAs (per constituent)	Soil: < 330.0 ppb
♠	PNAs (per constituent)	Water: < 5.0 ppb
•	Lead, total	Soil: < 100.0 ppb
o	Lead, dissolved	Water: < 2.0 ppb

TABLE 1

Soil and Ground Water Sampling Results

Sample ID	Date	Matrix	Depth Below Grade (feet)	Benzene♦ (ppb)	Toluene♦ (ppb)	Ethyl-Benzene♦ (ppb)	Xylenes♦ (ppb)	Total BTEX (ppb)	Total PNAs (ppb)	Lead (ppb)
TRIP	17-Mar-93	Water	None	ND	ND	ND	ND	ND	ND ♠	NS
MW-09	18-Mar-93	Soil	08'-10'	ND	14	56	150	220	ND ♠	NS
MW-09	18-Mar-93	Water	10'-15'	ND	ND	ND	ND	ND	ND ♠	NS
MW-09	18-Mar-93	Water	20'-25'	ND	ND	ND	ND	ND	ND ♠	NS
MW-09	18-Mar-93	Water	30'-35'	ND	ND	ND	ND	ND	ND ♠	NS
MW-09	18-Mar-93	Water	40'-45'	ND	ND	ND	ND	ND	ND ♠	NS
MW-07	25-Mar-93	Water	09'-14'	ND	ND	ND	ND	ND	ND ♠	NS
MW-08	25-Mar-93	Water	15'-20'	ND	3	1	10	14	ND ♠	NS
MW-09	25-Mar-93	Water	09'-14'	ND	ND	ND	ND	ND	ND ♠	NS
TRIP	25-Mar-93	Water	None	ND	ND	ND	ND	ND	NS	NS

ppb Parts per billion: = µg/kg (microgram per kilogram) for soil
= µg/L (micrograms per liter) for water
BTEX Benzene, Toluene, Ethyl-benzene and Xylenes
PNAs Polynuclear Aromatics
NS Not Sampled
ND (Non-Detect) Indicates Results Below Detection Limits
♠ Value shown is higher than aesthetic drinking water value but lower than health based drinking water value

Above Type B Criteria

Detection Limits:

♦	BTEX (per constituent)	Soil: < 10.0 ppb Water: < 1.0 ppb
■	PNAs (per constituent)	Soil: < 300.0 ppb
◄	PNAs (per constituent)	Soil: < 330.0 ppb
♣	PNAs (per constituent)	Water: < 5.0 ppb
•	Lead, total	Soil: < 100.0 ppb
○	Lead, dissolved	Water: < 2.0 ppb

TABLE 1

Soil and Ground Water Sampling Results

Sample ID	Date	Matrix	Depth Below Grade (feet)	Benzene♦ (ppb)	Toluene♦ (ppb)	Ethyl-Benzene♦ (ppb)	Xylenes♦ (ppb)	Total BTEX (ppb)	Total PNAs (ppb)	Lead (ppb)
MW-10	10-Nov-93	Soil	05'-07'	1,500	1,700	860	14,000	18,060	ND♠	NS
MW-11	10-Nov-93	Soil	05'-07'	ND	ND	ND	ND	ND	ND♠	NS
MW-11	10-Nov-93	Water	4.5'-9.5'	2,400	20	430	1,200	4,050	ND♠	NS
TRIP	10-Nov-93	Water	None	ND	ND	ND	ND	ND	NS	NS

ppb Parts per billion: = µg/kg (microgram per kilogram) for soil
= µg/L (micrograms per liter) for water
BTEX Benzene, Toluene, Ethyl-benzene and Xylenes
PNAs Polynuclear Aromatics
NS Not Sampled
ND (Non-Detect) Indicates Results Below Detection Limits
♠ Value shown is higher than aesthetic drinking water value but lower than health based drinking water value

Above Type B Criteria

Detection Limits:

♦	BTEX (per constituent)	Soil: < 10.0 ppb Water: < 1.0 ppb
■	PNAs (per constituent)	Soil: < 300.0 ppb
◂	PNAs (per constituent)	Soil: < 330.0 ppb
♣	PNAs (per constituent)	Water: < 5.0 ppb
•	Lead, total	Soil: < 100.0 ppb
o	Lead, dissolved	Water: < 2.0 ppb

TABLE 2

Static Ground Water Monitoring Results

Elevation Reading Date			6-1-92	6-5-92	6-16-92	7-1-92	3-3-93	3-4-93
Well ID	Screen Depth Below Grade (feet)	Top of Casing Elevation (feet)	Static Water Level Elevation (feet)	Static Water Level Elevation (feet)	Static Water Level Elevation (feet)	Static Water Level Elevation (feet)	Static Water Level Elevation (feet)	Static Water Level Elevation (feet)
MW-1	07'-12'	798.62	NM	793.59 / FP	NM	NM	NM	NM
MW-2	08'-13'	NS	NM	NM	NM	NM	5.66' BTOC	NM
MW-3	07'-12'	NS	NM	NM	NM	NM	5.84' BTOC	NM
MW-4	09'-14'	801.81	793.69	793.67	793.63	793.65	UL	NM
MW-5	05'-10'	798.86	794.16	793.20	791.14	793.17	793.19	793.22
MW-6	06'-10'	799.21	NM	NM	NM	793.38	792.66	793.17
MW-7	09'-14'	799.00	NM	NM	NM	NM	NM	NM
MW-8	15'-20'	799.43	NM	NM	NM	NM	NM	NM
MW-9	09'-14'	799.16	NM	NM	NM	NM	NM	NM

NS Well not surveyed (product monitor well)
NM Well water level not measured
UL Unable to locate well
UP Well under pressure (changing static water level)
BTOC Below top of casing
FP Well contained free product

TABLE 2

Static Ground Water Monitoring Results

Elevation Reading Date			3-25-93	5-14-93	7-13-93	8-23-93		
Well ID	Screen Depth Below Grade (feet)	Top of Casing Elevation (feet)	Static Water Level Elevation (feet)	Static Water Level Elevation (feet)	Static Water Level Elevation (feet)	Static Water Level Elevation (feet)	Static Water Level Elevation (feet)	Static Water Level Elevation (feet)
MW-1	07'-12'	798.62	NM	NM	NM	NM		
MW-2	08'-13'	NS	NM	NM	NM	NM		
MW-3	07'-12'	NS	NM	NM	NM	NM		
MW-4	09'-14'	801.81	UL	UL	UL	793.56		
MW-5	05'-10'	798.86	793.30	793.41	793.26	790.10		
MW-6	06'-10'	799.21	793.24	793.36	793.21	793.04		
MW-7	09'-14'	799.00	UP	793.15	793.00	NM		
MW-8	15'-20'	799.43	793.62	793.74	793.58	NM		
MW-9	09'-14'	799.16	793.41	NM	793.36	NM		

NS Well not surveyed (product monitor well)
NM Well water level not measured
UL Unable to locate well
UP Well under pressure (changing static water level)
BTOC Below top of casing
FP Well contained free product

RIM ELEV. 799.44'
8" N&E 791.7'

RIM ELEV. 799.43'
18" E&W 781.4'

RIM ELEV. 7
18" SOUTH
24" WEST
18" NORTH

ALLEN'S
RIM ELEV
BOTTOM

MW-9

PH

PH

MW-7

ST

ST

ST

ALLEN'S CREEK DRAIN

℄ of WASHINGTON ST

ST

S

RIM ELEVATION 799.34'

W

ØL

ØP

ØP

S

AH-2

FORMER ABOVE GROUND STORAGE TANK

PARKS AND RECREATION BUILDING

STAIRS

ST

AH-4

MW-11

MW-10

ST

DRUM STORAGE

PRODUCT RECOVERY EQUIPMENT

S

ST

ST

E

ST

MW-1

ST

ST

#1

#2

MW-6

AH-1

MW-2

AH761

MW-8

FORMER PRODUCT LINES

FORMER FUEL DISPENSERS

ST

MW-3

FORMER STORAGE SHED

A

APPROXIMATE LIMITS OF EXCAVATION (DEPTH 9' BG)

ST

MW-5

AH762

AH17-5

GARAGE

CONCRETE WALL

GARAGE

CONCRETE

WALL

WOODEN

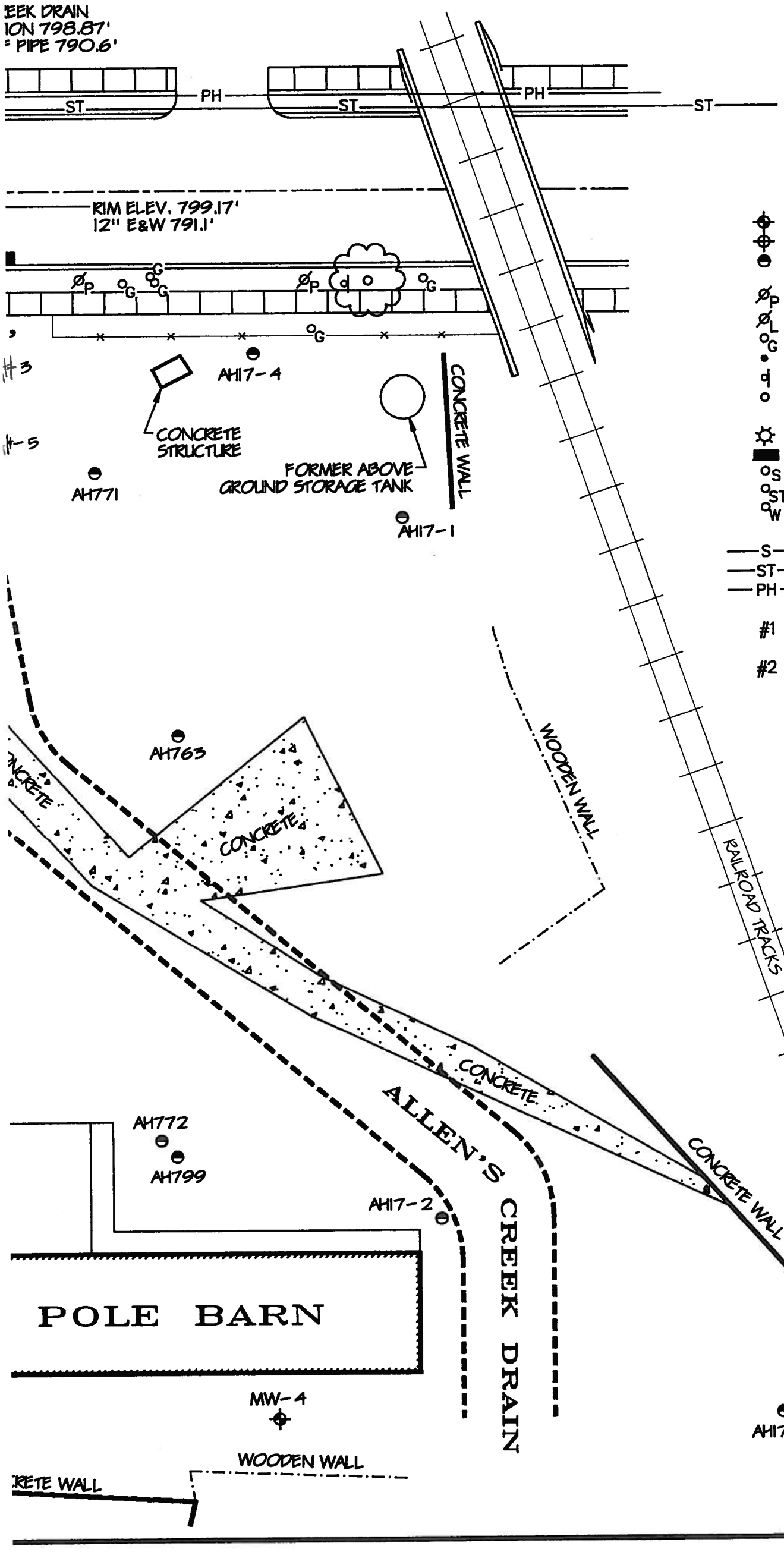
WALL

12.5

THE TRAVERSE GROUP
EASTERN OPERATIONS
3772 Plaza Drive
Ann Arbor, Michigan 48108
(313) 747-9300
FAX: (313) 747-9229

.51'
1.5'
1.3'
1.1'

EEK DRAIN
ION 798.87'
= PIPE 790.6'



LEGEND

⊕	MONITOR WELL – MW
⊕	PURGE WELL
⊖	AUGER HOLE – AH
$Ø_P$	TELEPHONE POLE
$Ø_L$	LIGHT POLE
O_G	GUY POLE
•	BUMPER POLE
d	SIGN
o	55 GALLON DRUM
☼	CATCH BASIN
▬	CURB INLET
O_S	SANITARY SEWER MANHOLE
O_{ST}	STORM SEWER MANHOLE
O_W	WATER LINE MANHOLE
—S—	SANITARY SEWER LINE
—ST—	STORM SEWER LINE
—PH—	UNDERGROUND TELEPHONE LINE
#1	FORMER 6,000 GALLON DIESEL UST
#2	FORMER 6,000 GALLON GASOLINE UST

12.5 25
LE: 1"=25'

FIGURE 2
SITE SKETCH
CITY OF ANN ARBOR
PARKS AND RECREATION BUILDING
415 W. WASHINGTON, ANN ARBOR, MI
01/12/94

EPH AA672001

THE TRAVERSE GROUP

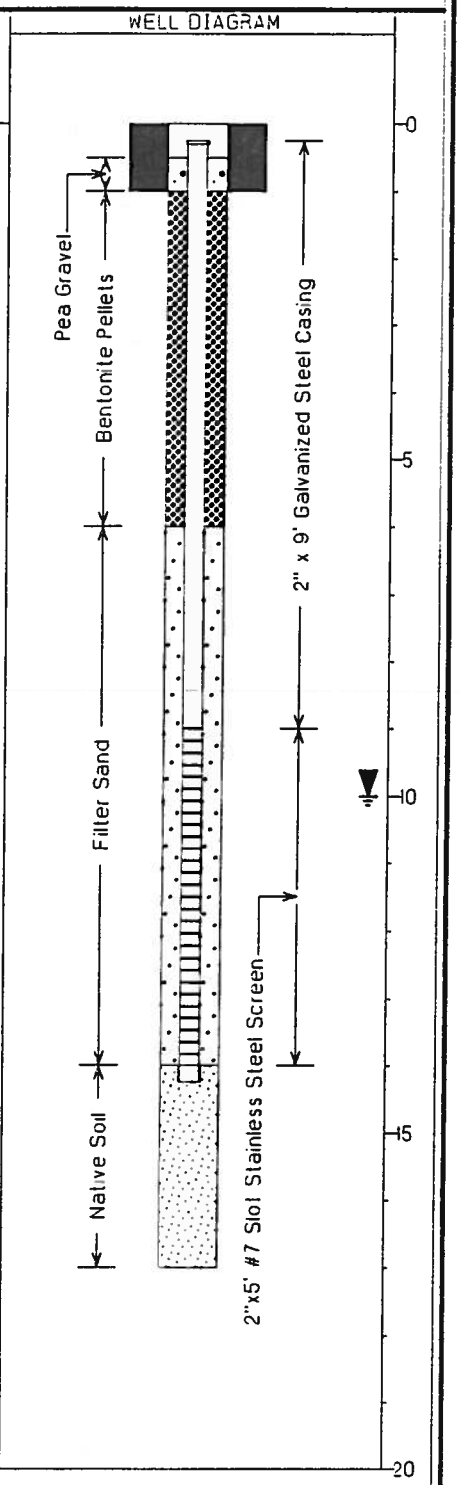
TRAVERSE DRILLING
2525 Aero Park Drive
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

A-4

PROJECT 415 West Washington Street
LOCATION Ann Arbor, Michigan
CLIENT City of Ann Arbor
PROJECT NUMBER 672B
DRILLER Mickey Probst HELPER Joe Harvey
INSTALLATION DATE 6/1/92

BORING/WELL NUMBER MW-4
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION N/A ft.
STATIC WATER LEVEL 10 ft.
DEVELOPMENT METHOD Bailer
WEATHER N/A

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
5		Soil	Split Spoon		
		Soil	Split Spoon		
		Soil	Split Spoon		
10		Soil	Split Spoon		
15					Medium Sand, Brown
20					End of Boring at 17 Feet



Signature _____

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TRAVERSE DRILLING
2525 Aero Park Drive
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

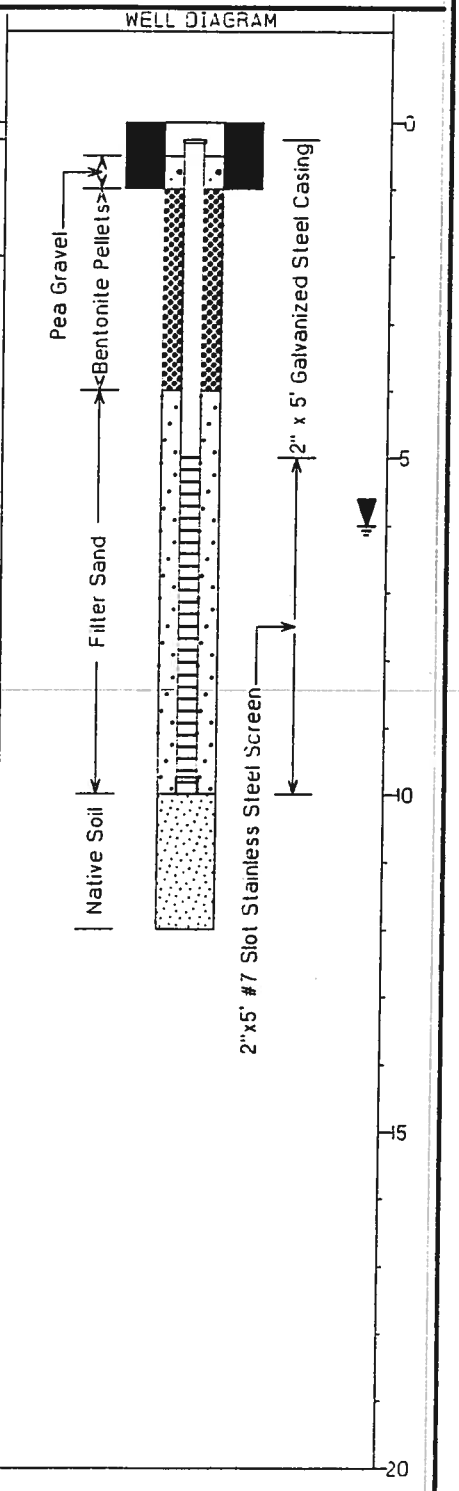
A-5

PROJECT 415 West Washington Street
LOCATION Ann Arbor, Michigan
CLIENT City of Ann Arbor
PROJECT NUMBER 672B
DRILLER Mickey Probst HELPER Joe Harvey
INSTALLATION DATE 6/1/92

BORING/WELL NUMBER MW-5
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION N/A ft.
STATIC WATER LEVEL 6 ft.
DEVELOPMENT METHOD Bailer
WEATHER N/A

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
0					Asphalt
					Concrete
		Soil	Split Spoon		
5		Soil	Split Spoon		
		Soil	Split Spoon		
10					Fine-Medium Sand, Brown-Black
					End of Boring at 12 Feet
15					
20					

WELL DIAGRAM



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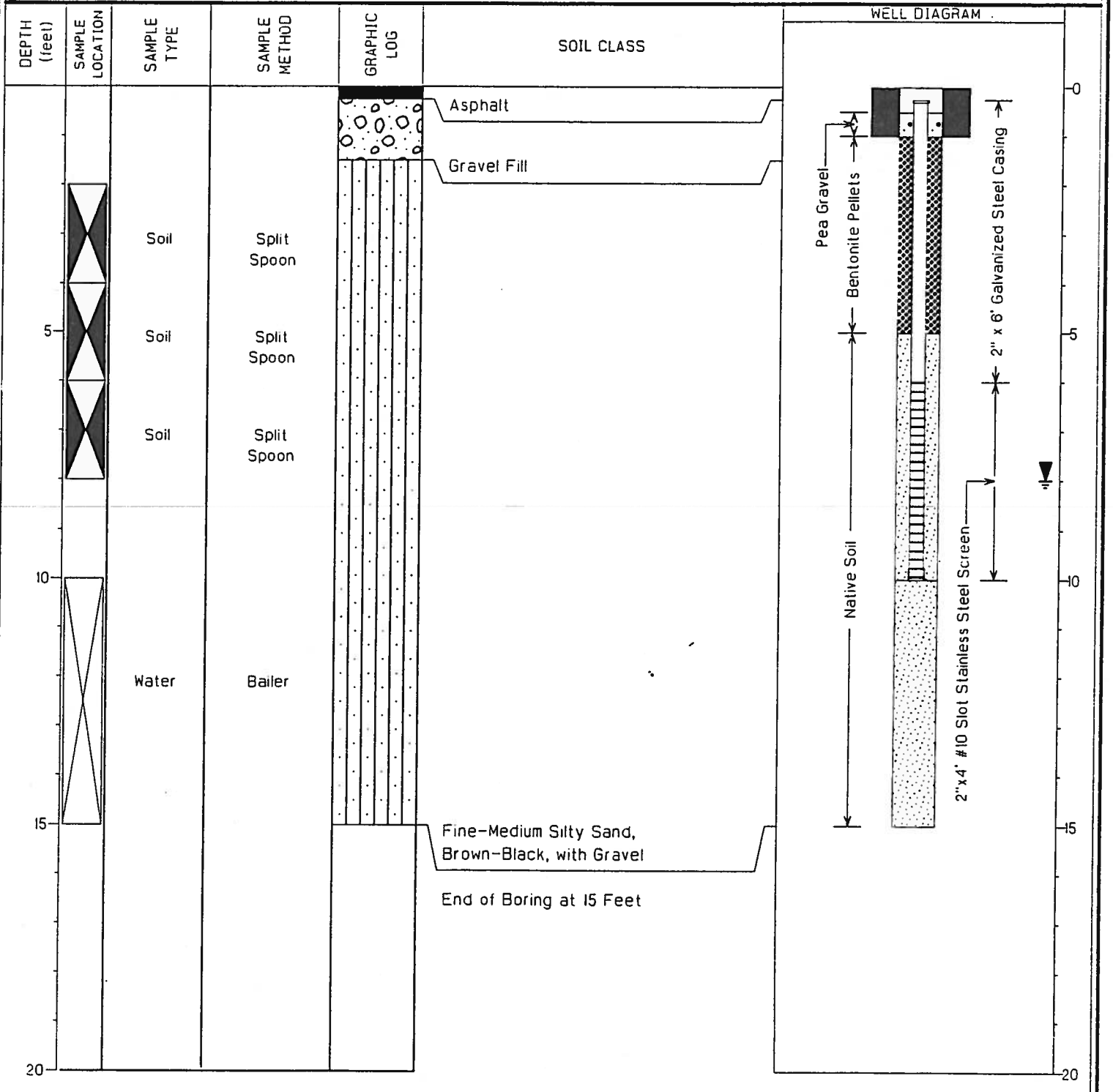
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

PROJECT 415 West Washington Street
LOCATION Ann Arbor, Michigan
CLIENT City of Ann Arbor
PROJECT NUMBER 672B
DRILLER Mark Stover HELPER Mark Leask
INSTALLATION DATE 6/15/92-6/16/92

BORING/WELL NUMBER AH-1/MW-6
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION N/A ft.
STATIC WATER LEVEL 8 ft.
DEVELOPMENT METHOD Bailer
WEATHER Sunny 70°



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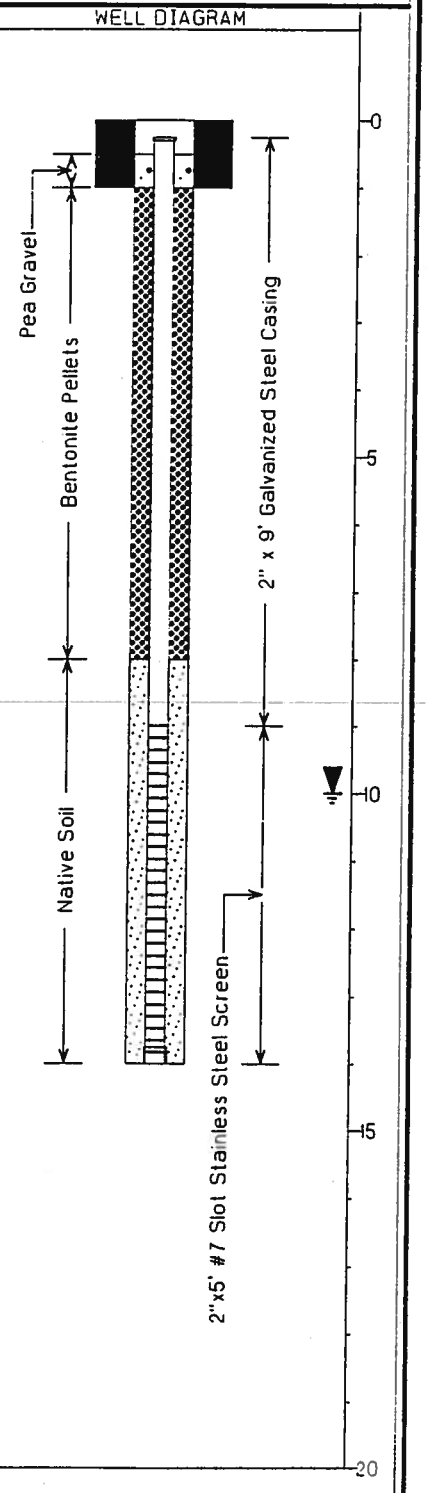
2525 Aero Park Drive
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

PROJECT 415 West Washington Street
LOCATION Ann Arbor, Michigan
CLIENT City of Ann Arbor
PROJECT NUMBER 672B
DRILLER Libby HELPER Don/Jim
INSTALLATION DATE 7/20/92

BORING/WELL NUMBER MW-7
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION N/A ft.
STATIC WATER LEVEL 10 ft.
DEVELOPMENT METHOD Development Pump
WEATHER N/A

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
0					Moist Topsoil, Black
5					Moist Sand Mixed and Cinder Fill
10		Soil	Split Spoon		Moist Organic Clay
		Water	Bailer		Wet Coarse Sand, Brown, with Trace Gravel
15					Wet Medium Sand, Brown, with Trace Gravel
					End of Boring at 14 Feet
20					



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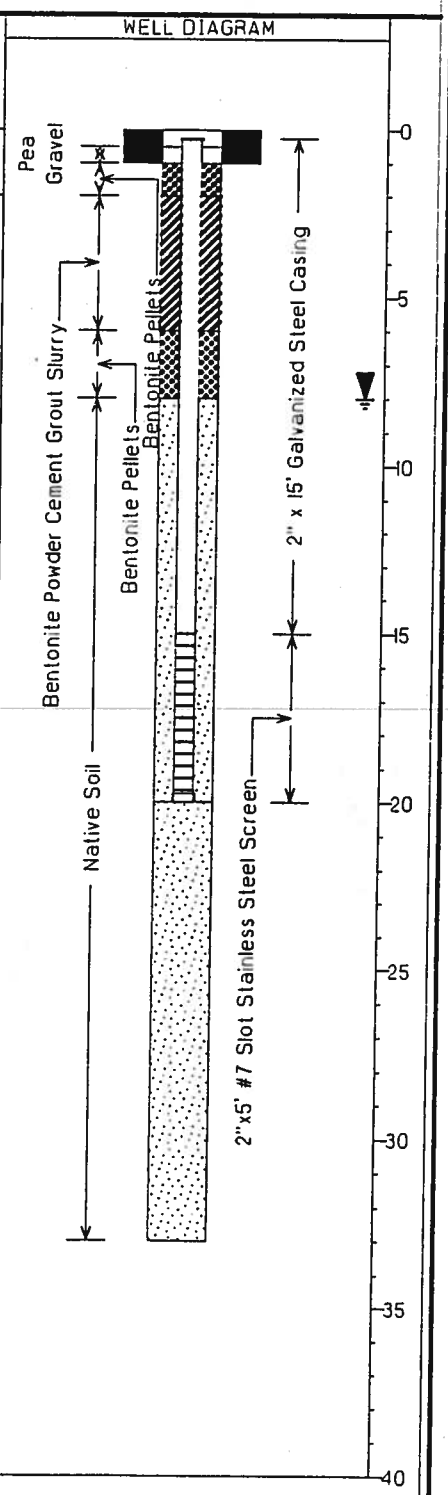
TRAVERSE DRILLING
2525 Aero Park Drive
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

A-21

JJECT 415 West Washington Street
LOCATION Ann Arbor, Michigan
CLIENT City of Ann Arbor
PROJECT NUMBER 6728
DRILLER Mark Leask HELPER Dale Wilson
INSTALLATION DATE 3/15/93

BORING/WELL NUMBER MW-8
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION N/A ft.
STATIC WATER LEVEL 8 ft.
DEVELOPMENT METHOD Development Pump
WEATHER Cloudy 30°

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
5		Soil	Split Spoon		Medium-Coarse Sand, Brown with Fine Gravel
		Soil	Split Spoon		
		Soil	Split Spoon		
10		Water	Bailer		Fine-Medium Silty Sand, Gray
15					
20		Water	Bailer		
25					Wet Medium Silty Sand, Gray
					Wet Medium Silty Sand, Gray, with Gravel
30		Water	Bailer		
35					Wet Medium-Coarse Sand
					End of Boring at 33 Feet
40					



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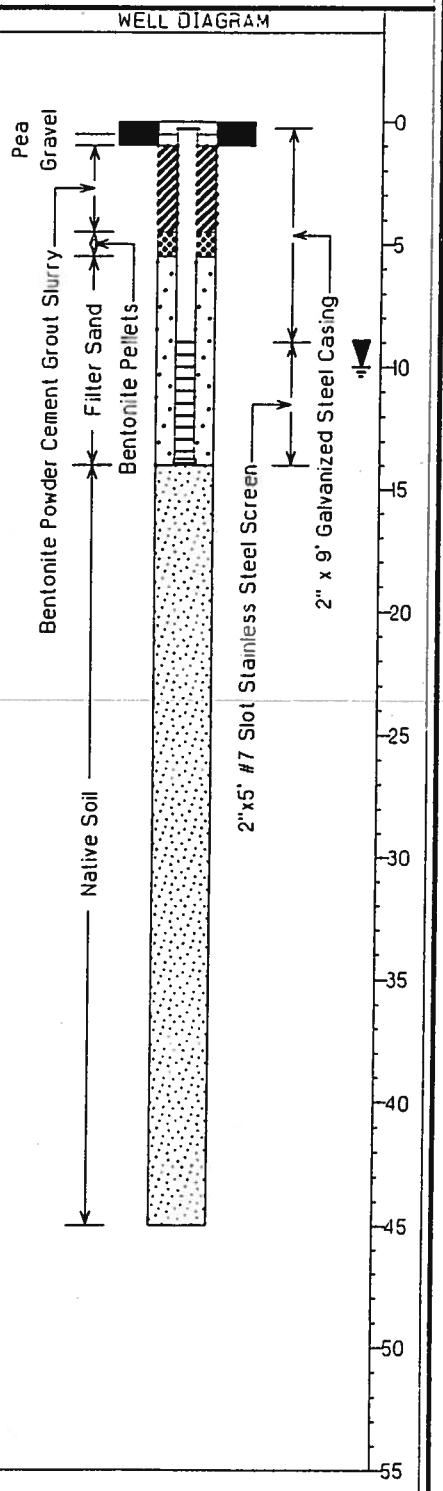
TRAVERSE DRILLING
2525 Aero Park Drive
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

JJECT 415 West Washington Street
LOCATION Ann Arbor, Michigan
CLIENT City of Ann Arbor
PROJECT NUMBER 6728
DRILLER John Dupuie HELPER Sam Clark
INSTALLATION DATE 3/18/93

BORING/WELL NUMBER MW-9
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION N/A ft.
STATIC WATER LEVEL 10 ft.
DEVELOPMENT METHOD Development Pump
WEATHER Sunny 25°

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
5		Soil	Split Spoon		Mixed Sand, Gravel, Bricks, Glass, Fill
10		Soil	Split Spoon		
		Soil	Split Spoon		Moist Organics, Black, with Trace Silty Sand
15		Water	Split Spoon Bailer		
20		Water	Bailer		
25					
30		Water	Bailer		
35					
40		Water	Bailer		
45					Wet Fine-Coarse Sand, Brown, with Trace Gravel
50					End of Boring at 45 Feet
55					



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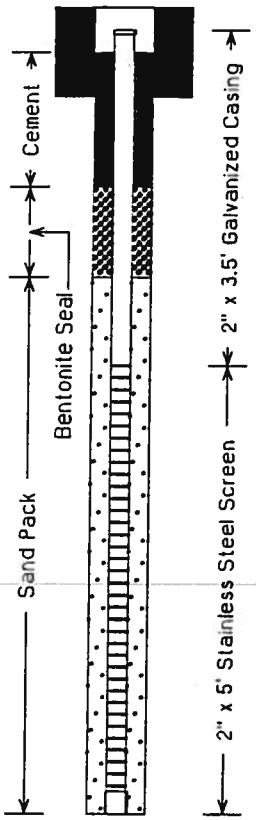
THE TRAVERSE GROUP
3135 Logan Valley Road
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

PROJECT Parks and Recreation Garage
LOCATION 415 West Washington Street
CLIENT City of Ann Arbor
PROJECT NUMBER 93173
DRILLER Paul Libby/CET HELPER Don Bond/CET
INSTALLATION DATE 11/10/93

BORING/WELL NUMBER MW-10
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION 798.53 ft.
STATIC WATER LEVEL Product in Well
DEVELOPMENT METHOD Bailer
WEATHER Clear, 35°

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
0					Asphalt
3					Mixed Sand and Stone
4					Mixed Sand, Stone, Clay and Brick Debris
5					Medium to Coarse Sand
6		Soil	SS		Peat
7					
8					
9					Coarse Sand
					End of Boring at 9 Feet

WELL DIAGRAM



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THE TRAVERSE GROUP

3135 Logan Valley Road
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

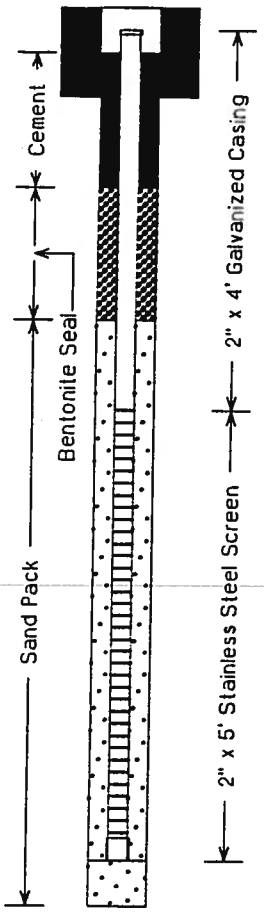
JJECT Parks and Recreation Garage
LOCATION 415 West Washington Street
CLIENT City of Ann Arbor
PROJECT NUMBER 93173
DRILLER Paul Libby/CET HELPER Don Bond/CET
INSTALLATION DATE 11/10/93

BORING/WELL NUMBER MW-11
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION 798.83 ft.
STATIC WATER LEVEL 793.30 ft.
DEVELOPMENT METHOD Bailer
WEATHER Clear, 35°

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
0-1					Concrete
1-4					Sand and Gravel Fill
5-6		Soil	SS		
6-7					Medium to Coarse Sand, Tan
7-10					Peat
10-15					Medium Sand, Some Silt and Clay

End of Boring at 10 Feet

WELL DIAGRAM



Signature

FEASIBILITY STUDY
CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 WEST WASHINGTON STREET

April 15, 1994

Submitted to:

Michigan Department of Natural Resources
Environmental Response Division
Jackson District Office
301 East Louis Glick Highway
Jackson, Michigan 49201

Prepared for:

City of Ann Arbor
100 North Fifth Street
Ann Arbor, Michigan 48107

Prepared by:
The Traverse Group, Inc.
3772 Plaza Dr.
Ann Arbor, Michigan 48108

CITY OF ANN ARBOR
PARKS AND RECREATION GARAGE
415 West Washington Street

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FEASIBILITY STUDY
CITY OF ANN ARBOR PARKS AND RECREATION GARAGE
415 West Washington Street

1.0 INTRODUCTION

The Traverse Group evaluates remedial action alternatives for underground storage tank (UST) release sites and Michigan Environmental Response Act (Act 307) release sites using Act 307 Rule 299.5513, and The Leaking Underground Storage Act 478 of 1988, as amended. The basic guidelines include on-site and off-site alternatives as well as a no action alternative. Each alternative is evaluated based on technical feasibility, cost effectiveness, and considerations with respect to disposal waste minimization/volume reduction, recycling, toxicity reduction, or destruction and mobility reduction.

The feasibility study evaluation consisted of two phases; an initial screening of the possible alternative treatment technologies outlined in Section 3.0 and a detailed evaluation of alternatives outlined in Section 4.0. Finally, a recommended alternative was selected and will be submitted to the Michigan Department of Natural Resources (MDNR), pending City of Ann Arbor approval, as part of the Corrective Action Plan (CAP).

2.0 BACKGROUND INFORMATION

The City of Ann Arbor was owner/operator of the former underground storage tank (UST) system at the Parks and Recreation Garage, 415 West Washington Street, Ann Arbor, Michigan. A release was reported from the 6,000 gallon unleaded gasoline UST following a failed tightness test. The unleaded gasoline UST, as well a diesel fuel UST, were removed on March 20, 1992. An initial volume of soil was removed and properly disposed, and free product removal efforts were initiated. Free product recovery efforts continue.

Site investigation activities were conducted in June and July 1992, as well as March and November 1993, resulting in the delineation of the hydrocarbons in the soil and ground water.

Detailed background information can be found in the *45-Day Report*, submitted by The Traverse Group to MDNR on April 17, 1992, and the *Site Investigation Report for an Underground Storage Tank Release*, submitted by The Traverse Group to MDNR concurrent with this report.

3.0 INITIAL SCREENING OF ALTERNATIVE TREATMENT TECHNOLOGIES - REVIEW AND COMPARISON

The Traverse Group has compiled a listing in *Table 1, Initial Screening of Alternative Treatment Technologies Review and Comparison*, of general technologies that may be possible treatment technologies for one or more of the constituents at the City of Ann Arbor Parks and Recreation Garage (SITE). As part of the initial screening, The Traverse Group reviewed the feasibility of each technology to meet Type B Closure of the contamination constituents (in any possible media) at the SITE.

Type A Closure is attained when either of the following cleanup conditions are met for a substance:

1) The substance concentration does not exceed background levels; or

2) The substance concentration is equal to or less than the analytical method detection limits for that substance.

Type B Closure is attained when the cleanup conditions are consistent with the specified guidelines posed by the State of Michigan and substance concentrations do not exceed calculated risk levels based upon standardized exposure assumptions and acceptable risks to human health and/or environment.

Type C Closure is attained when the site cleanup conditions provides for substance concentrations that do not pose an unacceptable risk to human health and/or the environment based upon site-specific assessment. Recently, MDNR issued new Type C Cleanup Criteria for industrial facilities, which may or may not apply to the SITE.

The initial screening of remedial alternatives is to identify and screen potentially applicable technologies. Technologies are screened to eliminate those that may prove difficult to implement based on specific affected media and chemicals of concern, risk-based cleanup criteria, geology, reliance on unproven technologies (applicability/reliability), or may not achieve the remedial objectives within a reasonable time period and/or cost. This screening process focuses on eliminating those technologies which have severe limitations for a given set of contamination constituents and site specific conditions.

The following assumptions were made in compiling *Table 1, Initial Screening of Alternative Treatment Technologies Review and Comparison*:

- Target constituents at the SITE consist of Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) and Polynuclear Aromatics (PNAs).

- Remediation of the SITE consists of achieving Type B Closure for the areas defined in *Figure 1*.

- Affected media could be in the form of granular fill material, native clayey soils, and ground water.

Please note that certain conventional remedial action options (no action, limited action, etc.) have been included for the sake of comparison. However, Type B Closure cannot be achieved with these options.

Table 1, Initial Screening of Alternative Treatment Technologies Review and Comparison, is set-up into four categories as follows:

Remedial Action - this category lists the type of action that could be taken and includes the various methods to accomplish that action.

Technology - within this category are the general technologies that coincide with the remedial action. Specific processes within these technologies may exist that are highly innovative and would be evaluated as part of further detailed evaluation.

Comments - the comments coincide with the technology and were solely based on their potential for Type B Closure.

Recommendations - this category was based on the feasibility of the technology in question to achieve Type B Closure according to the screening process criteria described above for the SITE.

Please refer to *Table 1, Initial Screening of Alternative Treatment Technologies Review and Comparison,* for the SITE, which is attached.

The technologies retained for further evaluation were Steam Injection/Vapor Extraction, Soil Vapor Extraction/Air Sparging, Bioventing, Free Product Recovery, and Ground Water Pump and Treat.

4.0 DETAILED EVALUATION OF ALTERNATIVES

The Traverse Group performed a detailed evaluation of the technology alternatives retained after initial screening using the more comprehensive list of parameters outlined by MDNR. The short-listed technologies were compared based on the identified site conditions (affected area, geology, site infrastructure), engineering considerations (contaminants of concern, technical feasibility, innovative technologies, capital and life cycle costs, risk based cleanup criteria) and client concerns (public relations, regulatory impact and remaining risk). An additional client concern was the need to minimize disruptions at the site during construction. The facility is routinely very active. Estimated capital costs, operation and maintenance costs, and estimated project durations were assigned to each technology. The presence of recoverable product at this site added additional cost to the remediation since most of the technologies examined do not work well in the presence of free product.

The following are brief descriptions of each short listed technology alternatives.

► *Steam Injection/Vapor Extraction* is a technology originally employed for oil well production enhancement. Injecting steam at low pressure into the hydrocarbon-affected areas heats the affected soil and ground water to volatilize lighter hydrocarbons, and decrease the viscosity of heavier hydrocarbons. This increases the mobility of the hydrocarbons, as well as increasing the total recovery rate. As expected, the technology is energy intensive.

► *Soil Vapor Extraction/Air Sparging* is a widely applied technology for removing petroleum hydrocarbons from the soil and ground water. Air is injected into the ground water below the hydrocarbon-affected saturated interval, and by vaporization, the hydrocarbons are transferred to the vapor phase and transported to the ground water surface. Upon reaching the unsaturated zone, the soil vapor extraction system takes over to collect the hydrocarbon vapors for treatment. Introducing excess oxygen to the subsurface will also stimulate the bacteria in the saturated and unsaturated soil enhancing biodegradation of the hydrocarbons.

► *Bioventing* is a relatively new technology employing the use of air sparging to remove the hydrocarbons from the affected ground water. As with SVE/AS, the vapors are transferred to the unsaturated soil zone. However, in this case the vapors are bioremediated in place by the indigenous bacteria in the soil rather than collecting the vapors with an SVE system.

► *Free Product Recovery* is a partial remedy for the site. Because soil and ground water remediations are carried to such low contaminant levels, it is most cost effective to recover as much concentrated product as possible in the early stages of the cleanup.

► *Ground Water Pump and Treat* is also a partial remedy for the site. The technology by itself will not clean up the affected unsaturated soil, and will only clean up the saturated soil over a very long period of time. It is effective, however, in increasing the efficiency of the product recovery system by creating a cone of depression in the water table into which the free product can migrate and be collected. It will also control the migration of dissolved hydrocarbons in the ground water. Finally, the previously saturated soil in the cone of depression will be available to the soil vapor extraction technologies for final cleanup.

All of the technology alternatives examined have been proven to be effective in remediating petroleum hydrocarbons. A bacterial assay of the soil at the site has confirmed the existence of hydrocarbon degraders in the soil at the site. The soil conditions are adequate for all of the short listed technologies to be effective. Except for the ground water pump and treat alternative, each of the technologies permanently and significantly reduce the volume and toxicity, by way of destruction or treatment. Mobility of contaminants may be slightly increased under alternatives utilizing sparging however, this risk will abe balanced by proper monitoring of both the vapors in the unsaturated zone and the ground water. While the remedial technology design is flexible, integrating the remedial design with the infrastructure at the site will be challenging, especially the Allen's Creek Drain. All of the technologies described above will entail installation of some system components below ground causing some disruption of normal SITE operations during system installation.

Table 2 is a detailed evaluation containing more specific positive and negative factors for each short listed technology as it applies to the site.

Estimated costs for implementing the various technologies were compiled and compared. Capital and operation and maintenance (O&M) costs were estimated, as well as estimated project lives. The Net Present Worth for each technology was calculated. The results of the analysis are presented in Table 3. The various cost factors, capital cost, O&M cost, project life, and interest rates, were varied as a sensitivity analysis to see which factor most influenced the Net Present Worth of each alternative. The sensitivity analysis revealed that the overall project cost was most affected by estimated project duration, followed by O&M costs. This is expected for longer term projects, those lasting over four to five years. In this case, the costs for free product recovery and ground water pump and treatment were added to all other technologies because they are not effective in a stand alone mode when free product is present.

Please note that all costs and project durations are estimates. At this site, the secondary soil and ground water treatment system may only be installed and operated after completing product recovery. The Net Present Worth for Steam Injection/Vapor Extraction, SVE/Air Sparging, and Bioventing include installation and two year's operation of the product recovery system. This scenario results in an ultimate project life of approximately five years. In the cases of the vapor extraction technologies, the soil venting portions could be installed at the outset to complement the product recovery efforts, with the air or steam injection portions activated at the completion of product recovery. This could conceivably decrease the project life.

5.0 SELECTED ALTERNATIVE

The selected alternative is a combination of technologies. Product recovery will be continued and expanded to reduce the current volume of free product in the soil to prevent migration and prepare the soil and ground water for the secondary treatment and ultimately decreasing the life of the cleanup project. The secondary treatment technology selected is SVE/Air Sparging. While the costs of bioventing appear more desirable when compared to SVE/Air Sparging, it was decided that SVE/Air Sparging was a more technically acceptable alternative.

Table 1 - INITIAL SCREENING OF ALTERNATIVE TREATMENT TECHNOLOGIES - REVIEW AND COMPARISON
City of Ann Arbor - Parks and Recreation Garage

Remedial Action	Technology[1]	Comments[2]	Recommendations[3]
NO ACTION	—	current site conditions above Type B Cleanup Criteria will remain	eliminate from further consideration
LIMITED ACTION (Type C)	Restricted Access and Institutional Controls	current site conditions above Type B Cleanup Criteria will remain	eliminate from further consideration
PHYSICAL CONTAINMENT	Surface Water Diversion, Capping, and Slurry Wall	potential off-site migration of contaminated ground water and free product due to surface run-off and subsurface transport phenomena will be reduced, however, current site conditions above Type B Cleanup Criteria will remain, too many structures in the affected area, no underlying clay layer to key into, long term monitoring requirements	eliminate from further consideration
In Situ TREATMENT			
Physical Methods	Steam Injection/Vacuum Extraction	volatilized hydrocarbons must be treated, steam injection delivery is difficult, reduced time period to treat soil, installation of system difficult due to high site activity, cost prohibitive, will enhance product recovery	retain for further evaluation
	Soil Vapor Extraction/Air Sparging	volatilized hydrocarbons must be treated, accelerated period to treat both soil and ground water, also demonstrated as effective for free product removal	retain for further evaluation
	Soil Vapor Extraction	volatilized hydrocarbons must be treated, long time period to treat soil, does not treat ground water effectively, not effective for removing free product	eliminate from further consideration
	Free Product Recovery	effectively reduces available hydrocarbons that migrate through soil and leach into ground water, does not reduce contamination to below Type B criteria, does not directly improve ground water quality, already have a recovery system in place which can be expanded	retain for further evaluation if combined with other technologies
	Solidification/Stabilization	reduces mobility of contaminants, however, contaminants still remain at site, unproven technology for organic contaminants, does not remediate ground water or free product	eliminate from further consideration
	Electroacoustic Decontamination	unproven technology, cost prohibitive	eliminate from further consideration
	Soil Vitrification	contaminants melted and fixed w/some volatilization, installation of system not feasible due to high site activity above and below grade, extremely cost prohibitive, does not remediate ground water, secondary effects of free product destruction difficult to predict/control	eliminate from further consideration

[1]Within these general technologies, specific processes may exist that are highly innovative and would be evaluated as a part of the detailed evaluation of alternative remedial technologies.
[2]Comments were directed at the possible potential for Type B Closure for each general technology.
[3]Recommendations were made based on whether the possibility existed for the technology in question to achieve Type B Closure according to the screening process criteria at the SITE.

Table 1 - INITIAL SCREENING OF ALTERNATIVE TREATMENT TECHNOLOGIES - REVIEW AND COMPARISON
City of Ann Arbor - Parks and Recreation Garage

Remedial Action	Technology[1]	Comments[2]	Recommendations[3]
Chemical Methods	Soil Flushing	generates liquid waste stream, requires hydraulic and chemical control of subsurface and treatment of aqueous waste stream, demonstrating hydraulic control will be difficult and costly due to Allen's Creek Drain, permitting difficult, soil-type dependent, liquid waste disposal costs, does address free product recovery	eliminate from further consideration
	Chemical Treatment - Oxidizers	strong oxidizers convert hydrocarbons to non-hazardous compounds, oxidizers dangerous to handle, demonstrating hydraulic control will be difficult and costly due to Allen's Creek Drain, permitting difficult, affects of strong oxidizers on free product unknown	eliminate from further consideration
Biological Methods	Soil Vapor Extraction/Air Sparging	requires vapor treatment, does not require discharge permit if closed loop, does address free product	retain for further evaluation
	Bioventing	does not require treatment of vapors, regulatory approval may be difficult, does address free product	retain for further evaluation
	Aerobic Microbial Degradation (Bioremediation)	aerobic oxidation process for removal, in unsaturated soil requires long time period to achieve cleanup, system reliability low, biological degradation rates are site specific and may not be acceptable, not effective on free product, active required hydraulic control, passive not feasible because of the presence of free product	eliminate from further consideration
***Ex Situ* TREATMENT**			
All ex-situ technologies, except Pump and Treat, require excavation, which do not address ground water contamination or free product removal, would be difficult to perform because of heavy traffic in the target area, and possibly produce unsafe vapor emissions			
Physical Methods	Landfill Disposal	potential long-term liability, short time-frame to achieve cleanup, can impact site production, presence of free product may classify excavated soil as hazardous waste	eliminate from further consideration
	Incineration	poor public perception, limited area to set up equipment, possible emissions concerns, cost prohibitive , short time-frame	eliminate from further consideration
	Low Temperature Thermal Desorption	possible emissions concerns, limited area to set up equipment, short time-frame	eliminate from further consideration

[1]Within these general technologies, specific processes may exist that are highly innovative and would be evaluated as a part of the detailed evaluation of alternative remedial technologies.
[2]Comments were directed at the possible potential for Type B Closure for each general technology.
[3]Recommendations were made based on whether the possibility existed for the technology in question to achieve Type B Closure according to the screening process criteria at the SITE.

Table 1 - INITIAL SCREENING OF ALTERNATIVE TREATMENT TECHNOLOGIES - REVIEW AND COMPARISON
City of Ann Arbor - Parks and Recreation Garage

Remedial Action	Technology[1]	Comments[2]	Recommendations[3]
	Pump and Treat	provides hydraulic control, addresses ground water contamination, water may or may not need treatment, depending on discharge requirements, long-term system operation, could be coupled with product recovery system	retain for further evaluation
Chemical Methods	Soil Washing	generates liquid waste stream, hydraulic and chemical control available, still requires treatment of aqueous waste stream, soil-type dependent, liquid waste disposal costs, limited area to set up equipment	eliminate from further consideration
	Solvent Extraction	solids are mixed with non-aqueous extraction fluid and separated, generates liquid waste stream, more control in above-ground reactor as compared to *In Situ*, soil-type dependent, liquid waste disposal costs, limited area to set up equipment	eliminate from further consideration
Biological Methods	Aerobic Microbial Degradation (Bioremediation)	better microbial ecology control in above-ground bioreactors, long time period to treat soil meaning higher life cycle costs, biological degradation rates are site specific, site constraints, limited area to set up equipment	eliminate from further consideration

[1]Within these general technologies, specific processes may exist that are highly innovative and would be evaluated as a part of the detailed evaluation of alternative remedial technologies.
[2]Comments were directed at the possible potential for Type B Closure for each general technology.
[3]Recommendations were made based on whether the possibility existed for the technology in question to achieve Type B Closure according to the screening process criteria at the SITE.

***Table 2* - DETAILED EVALUATION OF ALTERNATIVE TREATMENT TECHNOLOGIES**
City of Ann Arbor - Parks and Recreation Garage

Remedial Action	Technology	Positive Factors	Negative Factors
***In Situ* TREATMENT**			
Physical Methods	Steam Injection/Vacuum Extraction	Reduced time to treat soil and ground water, will enhance product recovery	Volatilized hydrocarbons must be treated, requires an Air Use Permit, steam delivery is difficult, costly due to energy consumption for steam generation
	Soil Vapor Extraction/Air Sparging	Accelerated period to treat both soil and ground water, may assist free product removal, simple and reliable mechanical components	Volatilized hydrocarbons must be treated, requires an Air Use Permit. If not closed loop, free product should be collected before installating and operating sparging.
	Free Product Recovery	Effectively reduces available hydrocarbons that migrate through soil and leach into ground water, already have product recovery system in place which can be expanded	Does not reduce contamination to below Type B criteria, does not directly improve ground water quality
Biological Methods	Soil Vapor Extraction/Air Sparging	Accelerated period to treat both soil and ground water, may assist free product removal, simple and reliable mechanical components	Volatilized hydrocarbons must be treated, requires an Air Use Permit. If not closed loop, free product should be collected before installating and operating sparging.
	Bioventing	Does not require vapor treatment, simple and reliable mechanical components	Regulatory approval may be difficult, may require an Air Use Permit, free product should be collected before installation and operation
***Ex Situ* TREATMENT**			
Physical Methods	Pump and Treat	Provides hydraulic control, addresses ground water contamination, simple and reliable, could be integrated with product recovery system	Water may or may not need treatment, depending on discharge requirements, long-term system operation and monitoring

[1]Within these general technologies, specific processes may exist that are highly innovative and would be evaluated as a part of the detailed evaluation of alternative remedial technologies.
[2]Comments were directed at the possible potential Type B Closure for each general technology.
[3]Recommendations were made based on whether the possibility existed for the technology in questions to achieve Type B Closure according to the screening process criteria at the Site.

***Table 3* - COST EVALUATION**
City of Ann Arbor - Parks and Recreation Garage

Technology	Capital Costs	O&M Annual Costs	Closure Cost	Project Life** (years)	Net Present Worth	Interest Rate
Steam Injection/Vapor Extraction	$93,550	$124,800	$22,500	2.0	$502,000*	5%
SVE/Air Sparging	$65,600	$102,000	$22,500	3.0	$421,000*	5%
Bioventing	$56,400	$57,200	$22,500	3.0	$302,000*	5%
Free Product Recovery	$18,000	$20,650		1.5	$47,000	5%
Pump and Treat	$35,200	$90,600		2.0	$204,000	5%

*The cost for implementing the free product recovery system has been added into the estimated total project cost.
** Estimated project life is based on subsurface investigation results and should be used for comparative purposes only. Further refinement of project life estimates should be completed as part of the final design.

***Table 4* - ESTIMATED EXPENDITURE SCHEDULE**
City of Ann Arbor - Parks and Recreation Garage

	1st year	2nd year	3rd year	4th year	5th year	6th year	Total
Capital	$53,200[1]		$65,600[1]				$118,800
O&M		$20,650[2]	$20,650[2]	$102,000[2]	$102,000[2]	$124,500[3]	$369,800
Total	$53,200	$20,650	$86,250	$102,000	$102,000	$124,500	$488,600[4]

[1]Includes design and installation costs (1st year product recovery, 3rd year SVE/AS)
[2]One full year operating costs (2nd and 3rd year product recovery, 4th, 5th and 6th year SVE/AS)
[3]One full year operating costs (SVE/AS) plus site closure sampling
[4]Not adjusted for inflation

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION

LEAKING UNDERGROUND STORAGE TANK SUPPLEMENTAL REPORT COVER SHEET

Authorized by the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), Part 213.

INSTRUCTIONS: Complete this form with all applicable information. Attach this form to all supplemental LUST submittals; this includes all reports other than the Initial Assessment, Final Assessment, and Closure Reports. The Certified Underground Storage Tank Professional (CP) MUST sign below.

IDENTIFY TYPE OF SUPPLEMENTAL REPORT: CORRECTIVE ACTION PLAN

FACILITY NAME: Ann Arbor Parks and Recreation Garage	**FACILITY ID NUMBER:** 0-008428
STREET ADDRESS: 415 W. Washington	**MERA SITE ID NUMBER:** 810148
CITY: Ann Arbor **STATE:** MI **ZIP CODE:** 48103 **COUNTY:** Washtenaw	
DATE(S) RELEASE(S) DISCOVERED: 03/19/92	**CONFIRMED RELEASE NUMBER(S):**
O/O NAME: City of Ann Arbor	**MUSTFA CLAIM NUMBER:** 2948
O/O STREET ADDRESS: 100 N. Fifth Ave., PO Box 8647 **CITY:** Ann Arbor **STATE:** MI **ZIP CODE:** 48107-8647	
CONTACT PERSON: Sandra M. Kenzie	**PHONE NUMBER:** (313) 994-6095

ANSWER ALL QUESTIONS

1. Type(s) of product released: Gasoline and Diesel Fuel

2. Free product present: a. Currently? X YES ___ NO If YES, total gallons recovered since last report: 220 (product & water)
   b. Previously? X YES ___ NO If YES, total gallons recovered to date: 2980 (product & water)

3. Have vapors been identified in any confined spaces (basement, sewers)? ___ YES X NO

4. Estimated depth to groundwater: 6' Estimated groundwater flow direction: North Northwest

5. Estimated distance and direction from point of release to nearest:
   a. Private well: 2.0 mi b. Municipal well: 1.5 mi c. Surface water/wetland: 0.7 Miles Northeast

6. Since last report: a. cubic yards of soil remediated: 5 b. gallons of groundwater remediated: 1155

7. Totals to date: a. cubic yards of soil remediated: 202 b. gallons of groundwater remediated: 1540 Not including free product & water

8. Michigan RBCA Site Classification (1-4): 1

CERTIFICATION OF REPORT COMPLETION

I, the undersigned CP, hereby attest to the best of my knowledge and belief that the statements in this document and all attachments are true, accurate, and complete. I certify that it was submitted to the USTD on APRIL 23, 1996 (date submitted-Required).

CP Original Signature - Required / Date	D. Nona, P.E. — PRINT QC Project Manager's Name
D. Nona — PRINT CP's Name	NTH Consultants, Ltd. — NAME OF CONSULTING FIRM
38955 Hills Tech Drive Farmington Hills, MI 48331-3432 — ADDRESS	(810) 553-6300 (810) 489-0727 — PHONE NO. FAX NO.

Please return this completed report cover sheet and associated attachments to the appropriate USTD District Office listed on the back of this page.

EQP3849 (2/96)

UNDERGROUND STORAGE TANK DIVISION OFFICES AND LOCATIONS

Determine in which county the UST release occurred. Return all completed forms and associated reports to the USTD office listed next to that county in the following table. Addresses for the USTD offices are listed below.

COUNTY	USTD OFFICE	COUNTY	USTD OFFICE	COUNTY	USTD OFFICE	COUNTY	USTD OFFICE
Alcona	Grayling	Dickinson	Marquette	Lake	Grayling	Oceana	Grand Rapids
Alger	Marquette	Eaton	Shiawassee	Lapeer	Shiawassee	Ogemaw	Grayling
Allegan	Plainwell	Emmet	Grayling	Leelanau	Grayling	Ontonagon	Marquette
Alpena	Grayling	Genesee	Shiawassee	Lenawee	Jackson	Osceola	Grayling
Antrim	Grayling	Gladwin	Grayling	Livingston	Shiawassee	Oscoda	Grayling
Arenac	Grayling	Gogebic	Marquette	Luce	Marquette	Otsego	Grayling
Baraga	Marquette	Grand Traverse	Grayling	Mackinac	Marquette	Ottawa	Grand Rapids
Barry	Plainwell	Gratiot	Shiawassee	Macomb	SE Michigan	Presque Isle	Grayling
Bay	Saginaw-Bay	Hillsdale	Jackson	Manistee	Grayling	Roscommon	Grayling
Benzie	Grayling	Houghton	Marquette	Marquette	Marquette	Saginaw	Saginaw-Bay
Berrien	Plainwell	Huron	Saginaw-Bay	Mason	Grayling	Sanilac	Saginaw-Bay
Branch	Jackson	Ingham	Shiawassee	Mecosta	Grand Rapids	Schoolcraft	Marquette
Calhoun	Jackson	Ionia	Grand Rapids	Menominee	Marquette	Shiawassee	Shiawassee
Cass	Plainwell	Iosco	Grayling	Midland	Saginaw-Bay	St Clair	SE Michigan
Charlevoix	Grayling	Iron	Marquette	Missaukee	Grayling	St Joseph	Plainwell
Cheboygan	Grayling	Isabella	Saginaw-Bay	Monroe	SE Michigan	Tuscola	Saginaw-Bay
Chippewa	Marquette	Jackson	Jackson	Montcalm	Grand Rapids	Van Buren	Plainwell
Clare	Grayling	Kalamazoo	Plainwell	Montmorency	Grayling	Washtenaw	Jackson
Clinton	Shiawassee	Kalkaska	Grayling	Muskegon	Grand Rapids	Wayne	SE Michigan
Crawford	Grayling	Kent	Grand Rapids	Newaygo	Grand Rapids	Wexford	Grayling
Delta	Marquette	Keweenaw	Marquette	Oakland	SE Michigan		

CADILLAC OFFICE
ROUTE #1 8015 MACKINAW TRAIL
CADILLAC MI 49601

616-775-9727 (PHONE)
616-775-9671 (FAX)

JACKSON OFFICE
301 E LOUIS GLICK HIGHWAY
JACKSON MI 49201

517-780-7900 (PHONE)
517-780-7855 (FAX)

SAGINAW BAY OFFICE
503 N EUCLID AVE SUITE 9
BAY CITY MI 48706

517-684-9141 (PHONE)
517-684-9799 (FAX)

GAYLORD OFFICE
P0 BOX 667
GAYLORD MI 49735

517-732-3541 (PHONE)
517-732-0794 (FAX)

MARQUETTE OFFICE
1990 US 41 SOUTH
MARQUETTE MI 49855

906-228-6561 (PHONE)
906-228-5245 (FAX)

SHIAWASSEE OFFICE
10650 BENNETT DR
MORRICE MI 48857-9792

517-625-4600 (PHONE)
517-625-5000 (FAX)

GRAND RAPIDS OFFICE
350 OTTAWA ST NW
GRAND RAPIDS MI 49503

616-456-5071 (PHONE)
616-456-1239 (FAX)

PLAINWELL OFFICE
1342 SR-89 SUITE B
PLAINWELL MI 49080-1915

616-692-2120 (PHONE)
616-692-3050 (FAX)

SE MICHIGAN OFFICE
38980 SEVEN MILE RD
LIVONIA MI 48152

313-953-0241 (PHONE)
313-432-1295 (FAX)

GRAYLING OFFICE
1955 NORTH I-75 BL
GRAYLING MI 49738

517-348-6371 (PHONE)
517-348-8825 (FAX)

Draft EQP3849 (1/96)

DEPARTMENT OF ENVIRONMENTAL QUALITY
UNDERGROUND STORAGE TANK DIVISION

LUST AUDIT REPORT

Authorized by 1994 PA 451, as amended

SITE NAME & ADDRESS:	Ann Arbor Parks and Recreation Garage 415 W. Michigan Avenue Ann Arbor, Michigan	CONSULTANT NAME & ADDRESS:	D. Nona NTH Consultants, Ltd. 38955 Hills Tech Drive Farmington Hills, MI 48331-3432
MERA SITE ID#: 810148	FACILITY ID# 0-008428	DEQ REVIEWER:	Terry Hiske
COUNTY:	Washtenaw	AUDIT DATE:	05/20/96

REPORT REVIEWED: (Check one only)

Free Product Report	Final Assessment Report (365 day)	Release Closure
Initial Assessment Report (90 day)		
	X Corrective Action Plan (CAP)	

On-Site Activity Date: OTHER (specify):

FINDINGS:	The CAP has been reviewed and found acceptable.
RECOMMENDATIONS:	Please proceed as proposed. Please notify this office 48 hours prior to on-site activities.
ACTION TAKEN:	

DEQ PROJECT MANAGER'S SIGNATURE: Terry Hiske 5-20-96	RECEIVED BY:

Original: Site File COPIES TO: Owner/Operator, Consultant

PR 3804 (9/94)

NTH Consultants, Ltd.

Corrective Action Plan

Park & Recreation Garage
City of Ann Arbor
415 West Washington Street
Ann Arbor, Michigan

Prepared For:

City of Ann Arbor
Engineering Division
Ann Arbor, Michigan

Project No. 13-5001-04
March 29, 1996

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EXECUTIVE SUMMARY

The release of gasoline and diesel from two underground storage tanks (UST) at the City of Ann Arbor's Parks & Recreation Garage, located at 415 West Washington Street in Ann Arbor, Michigan has impacted soil and groundwater with petroleum at the site. Utilizing the results of site investigation and contaminant chafacterization completed by The Traverse Group, Inc. (TGI) and the results of additional site investigation and pilot testing of several remediation technologies by NTH Consultants, Ltd. (NTH), we have prepared this corrective action plan (CAP) for the impacted soil and groundwater at the site. This report includes a brief review of previous studies; information regarding the additional site investigation by NTH; background information including site geology, hydrogeology, and contaminant distribution; a description of the pilot test methods and results; and a conceptual remedial design. Information provided in this document will be used to prepare the project construction drawings.

Our site investigation included drilling six test borings; installing three monitoring wells and three piezometer nests; and the completion of a chemical testing program of groundwater and soil samples.

Based on TGI and NTH investigations, the site geology across the zone of impacted soil and groundwater consists of the following layers from top to bottom: Fill; fine to medium sand; moist black peat; and wet fine to coarse brown sand. Both investigations indicated that the groundwater table is relatively level across the site typically at 792.3 feet in August 1995 (NTH) and at 793.4 feet in July 1993 (TGI). Based on this information, it appears that little of the impacted sandy soils below the peat layer are unsaturated. Based on the results of TGI investigation and NTH additional investigation, we estimated the extent of impacted groundwater and soils in accordance with Tier One Residential Cleanup Criteria.

Our pilot testing program evaluated several remediation technologies including pump and treat, soil vapor extraction (SVE), bioventing (BV), and air sparging (AS). Using the pilot study data, we

estimated the hydraulic properties of the soils and collected information regarding the response of the impacted soils to the different remediation methods.

Based on available subsurface information and results of our pilot testing, we developed a conceptual remedial system for the impacted soils and groundwater. The proposed system consists of the following:(1) three dewatering/product recovery wells; (2) three SVE/BV well nests and an SVE trench; (3) three AS wells; and (4) an above ground treatment system. The dewatering/ product recovery and AS wells will be used to remedy the impacted groundwater. The SVE/BV wells will be installed in pairs with one addressing the unsaturated zone above the peat layer and the other addressing the zone below the peat. There will be no saturated zone above this peat layer due to the dewatering operation.

The above-ground treatment system for the liquid phase will include oil-water separation for product recovery followed by an air stripper and carbon polishing. For the vapor phase, the above ground treatment system consists of a vapor phase carbon treatment. The above-ground treatment system will be housed in a winterized shed located in the courtyard immediately adjacent to the garage and former tank area. After securing the required disposal permits, treated water may be discharged in Allen Creek.

Review of the previous work conducted at the site and earlier discussions with the City indicated that the site should be remediated to Type B cleanup criteria. However, since the soil and groundwater criteria have recently changed based on PA 451 amendments (Part 213, PA 451), the cleanup goals used to develop this final CAP followed the recently published MDNR Tier One Risk Based Corrective Action (RBCA) soil and groundwater cleanup criteria.

1.0 INTRODUCTION

The City of Ann Arbor (City) reported a release from two 6,000-gallon underground storage tanks (USTs) that were used for storage of gasoline and diesel fuel located at the Parks and Recreation Garage, 415 West Washington Street, Ann Arbor, Michigan, (see Plate 1). The tanks were owned and operated by the City. The USTs were removed from the site on March 20, 1992.

The City contracted the services of The Traverse Group, Inc. (TGI) to characterize the site geology and hydrology, to assess the nature and extent of contamination and to conduct a preliminary feasibility analysis of viable remedial alternatives for site cleanup. TGI completed numerous boreholes and monitoring wells and collected and analyzed soil and groundwater samples. In addition, they also installed a free product recovery system to remove free-phase product previously detected at the site. The results of these activities are reported in the following reports:

- 45-Day Report, dated April 17, 1992,
- Site Investigation Report for an Underground Storage Tank Release, dated April 15, 1994, and
- Feasibility Study, dated April 15, 1994.

Subsequently, the City retained NTH Consultants, Ltd., (NTH) in December, 1994 to complete the design, construction and startup of a remedial system for the site and also to operate and maintain the system. The results presented in previous TGI reports provided the basis for NTH's approach.

NTH has reviewed the previous reports for the site prepared by TGI, completed additional site investigation, designed and implemented a pilot study at the site and developed a remedial

alternative for site cleanup. The results of NTH's activities are reported in this Corrective Action Plan (CAP).

Consistent with the appropriate and applicable regulations in 1994 the City recommended that the site be remediated to MDNR Type B soil and groundwater criteria. However, since the soil and groundwater criteria have recently changed, The City has agreed to develop this final CAP based on cleanup goals consistent with newly promulgated and some what similar MDEQ RBCA Tier I soil and groundwater cleanup criteria.

2.0 ADDITIONAL SITE INVESTIGATION

2.1 PURPOSE AND SCOPE

The purpose of the additional investigation was to better characterize the source area soil and groundwater conditions to facilitate design and implementation of both the pilot study and the full-scale remediation system. Specific tasks of the investigation included:

- Drilling and Soil Sampling - A total of 6 soil borings were completed in and around the UST source area, (see Plate 2). Soil samples were collected for classification and analysis. The borings were used for determining soil types and for the installation of test wells and piezometers.

- Installation of Test Wells and Piezometers - Three test wells and three piezometer nests were installed for the additional investigation and for the pilot study. The three test wells consist of a 4-inch diameter soil vapor extraction/recovery well, a 4-inch diameter air sparging well, and a 2-inch bioventing well nest. Each of the three piezometer nests contains four 1-inch diameter piezometers.

- Analytical Testing - Analytical testing for soil and groundwater samples included BTEX and MTBE (Method 8020), PNAs (Method 8310), and Lead (Method 7421).

- Evaluation - The data from the additional investigation has been compiled and evaluated as presented later in this report.

2.2 INVESTIGATIVE METHODS

2.2.1 Drilling and Soil Sampling

Six test borings (TB-1 through TB-6) were drilled and sampled by Geo Tek, Inc. of Lowell, Michigan under the technical supervision of NTH personnel on April 6, 7, 10, 11, and 12, 1995. The test borings were also used for the installation of test wells and piezometers for the pilot study. The approximate locations of the borings are shown on Plate 2. Logs of test borings, wells, and piezometers are included in Appendix A of this document.

The test borings were advanced to depths ranging from 11.5 to 30.0 feet with a trailer mounted CME-45 rotary drill rig equipped with 4 -1/4 inch inside diameter hollow stem augers. An NTH field technician maintained a log of each boring which included a description of the soil samples collected, information on groundwater conditions encountered during drilling and other pertinent data. Soil samples were collected at 2.5 and 5.0 foot depth intervals using a 2- inch outside diameter split barrel sampler according to ASTM D-1586. Information from the standard penetration test, namely the standard penetration resistance (N) and the blow counts were recorded on the log for each boring.

After opening the split barrel soil sampler and describing the contents, a representative soil sample was placed in laboratory-supplied glass containers for chemical testing and another portion of the soil sample was collected in a plastic storage bag with a sealable top for field headspace testing (screening). The samples collected in storage bags were allowed to reach approximately 70 degrees Fahrenheit and then the approximate concentration of total volatile organic compounds (VOCs) in the air-space inside the bag was measured with a portable photoionization (HNU) meter. The sample "screening" was performed by inserting the probe tip of the HNU meter into a small opening in the seal of the plastic storage bag. The HNU response to the headspace gas inside the bag was then observed and recorded on the field log. Soil samples for chemical testing were placed in iced coolers and were transported to an analytical laboratory using standard Chain-of-Custody procedures.

Prior to arrival on site and between borings, the drilling and sampling equipment were steam cleaned to minimize the potential for cross contamination of samples. In addition, the split barrel sampler was decontaminated between successive samples at each boring.

Soil and groundwater conditions encountered in the test borings have been evaluated and are presented in the form of individual Test Boring Logs and are attached as Figures 1 through 6 in Appendix A. Our General Notes describing nomenclature used on the logs is also attached as Exhibit A. The test boring logs have been prepared on the basis of field classification of the soils encountered. The stratification lines shown on the logs represent the approximate boundary between soil types, but the actual transition may be more gradual. The boring logs also present information relating to soil sample data, standard penetration test results, groundwater conditions observed in the borings, personnel involved and other pertinent data.

Upon completion of soil sampling, test boring Nos. TB-1 through TB-6 were then over-drilled using 6 1/4 or 8 1/4 inch inside diameter hollow stem augers to allow for test well or piezometer nest installation.

2.2.2 Installation of Groundwater Recovery/Injection Test Wells

An Air sparge well (AS-1), bioventing well (BV-1) and soil vapor extraction/recovery well (SVE-1) were installed in test boring Nos. TB-1, TB-3, and TB-4, respectively. These wells were installed for air sparging, groundwater pump testing, soil vapor extraction and bioventing tests for the pilot study and also can serve as groundwater monitoring wells. Components of each well are described below.

- AS-1 consists of a 4-inch diameter by 5 foot long PVC screen (0.010 inch slot) flush-coupled to 4-inch diameter PVC riser pipe, (see Figure 7 in Appendix A);

- BV-1 consists of a 2-inch diameter by 5 foot long PVC screen (0.010 inch slot) and one 2-inch diameter by 4 foot long PVC screen (0.010 inch slot), each flush coupled to 2-inch

diameter PVC riser pipe. The biovent well screens are set such that they are nested, (see Figure 8 in Appendix A);

- SVE-1 consist of a 4-inch diameter by 15 foot long PVC screen (0.010 inch slot) flush-coupled with 4-inch diameter PVC riser pipe, (see Figure 9 in Appendix A);

Following completion of over drilling with 6 -1/4 and 8 - 1/4 inch ID augers, well assemblies for AS-1, BV-1, and SVE-1 were lowered in the bottom of the respective borings through the hollow stem augers (completed well depths range from 12.0 to 23.6 feet). For each well and in accordance with specific well design, various annular space was then filled with washed silica sand, followed by hydrated bentonite pellets and cement-bentonite grout. Each well head was secured with a steel protective cover.

Information regarding well installation procedures and materials used are presented in the form of individual well logs, presented as Figures No. 7 through 9 in Appendix A.

The top of the casing elevations were surveyed to the nearest 0.01 foot using conventional surveying techniques. NTH personnel used the top of casing elevations of previously installed wells for benchmark reference to determine the top of casing and ground surface elevations of recently installed piezometers and test borings. Monitoring wells installed previously by TGI were surveyed by registered surveyors to determine top of casing elevations correlated with USGS benchmark datum to the nearest 0.01 foot.

2.2.3 Installation of Piezometer Nests

Following over drilling with the 6 1/4 or 8 1/4 inch hollow stem augers, nested piezometers P-1, P-2 and P-3 were installed in test boring TB-2, TB-5 and TB-6, respectively. Each nested piezometer contains four piezometers. The piezometers are constructed of one inch diameter by 1-foot or 2-foot long PVC screens (0.010 inch slot) flush coupled to one inch diameter PVC riser

pipe. In each piezometer nest, the screen tips are set at 5, 10, 15 and 20 feet below existing ground surface. The annular space around each screen contains washed silica sand. The well screens within each

piezometer nest are separated by bentonite seals. Each piezometer nest was completed with a 1-foot thick concrete pad and a steel protective cover at the ground surface. Piezometer nest construction details are provided in Figures 10 through 12 in Appendix A.

2.2.4 Groundwater Sampling and Analysis

On September 4, 1995 NTH personnel collected groundwater samples from recently installed piezometers P-1, P-2 and P-3 (9'-10' screened interval) and from four previously installed monitoring wells MW-3, MW-6, MW-8 and MW-11. The piezometers were sampled using a peristaltic pump and clear PVC tubing (a new section of tubing was utilized for each sample). The monitoring wells were sampled using bottom filling, disposable HDPE bailers. Prior to sampling, each piezometer or well was purged of at least 3 well volumes of water. The well development and purge water was temporarily stored on-site in DOT approved metal containers awaiting proper disposal.

The collected samples were placed in laboratory supplied sample bottles with appropriate preservatives. The sample bottles were then placed in a field cooler with ice and were transported to National Environmental Testing, Inc. (NET) in Auburn Hills, Michigan for chemical testing under standard Chain-of-Custody protocol. The groundwater samples collected from the wells were analyzed for the presence of BTEX, MTBE, PNAs and dissolved lead using the proper EPA SW-846 Test Methods. The portion of each groundwater sample analyzed for dissolved lead was filtered at the time of sampling by NTH personnel using 0.45 micron disposable filters. The results of the groundwater chemical testing are provided on Table 2 in Appendix B. The laboratory analytical reports and laboratory QA/QC data are also provided in Appendix B.

2.2.5 Analytical Testing of Soil Samples

A total of fourteen soil samples (3 from TB-1; 4 from TB-2; 2 from TB-3; 2 from TB-4; 3 from TB-5) collected from the test borings for this investigation were analyzed by NET for the presence of BTEX, MTBE, PNAs and total lead using the proper EPA SW-846 Test Methods. No samples from TB-6 were analyzed due to TB-6's proximity to already tested TB-1 and TB-3. The chemical testing data is summarized on Table 1 in Appendix B. Laboratory data reports and laboratory QA/QC data are also provided in Appendix B.

3.0 SITE GEOLOGY, HYDROGEOLOGY, AND CONTAMINANT DISTRIBUTION

3.1 SITE GEOLOGY

Based on site investigations completed by TGI and NTH, the general subsurface soil conditions observed across the zone of petroleum impacted soil and groundwater are as summarized in the following table. The table was developed from logs of test borings completed during on-site subsurface investigations.

DEPTH(feet)	SOIL DESCRIPTION
0.0 to 0.5	Asphalt/Concrete
0.5 to 4.0	Fill - Mixed sand, stone, clay, cinder and brick debris
4.0 to 6.0	Native - Fine to medium silty brown sand
6.0 to 8.0	Native - Moist organics, black peat
8.0 to 46.0	Native - Wet, fine to coarse brown sand

As shown in the above table, at approximately 6 to 8 feet below ground level (bgl), the soil is primarily black organic peat. The elevation of the bottom of this layer ranged from 790.25 feet to 792.50 feet. The peat layer top and bottom elevation contour maps are presented on Plates 3 and 4, respectively. Below the peat layer, sand with gravel extends to depths of more than 46 feet bgl based on review of TGI's investigation report. A well-cemented sand unit or hardpan was encountered at 46 feet bgl in the northwest portion of the site per TGI.

3.2 SITE HYDROGEOLOGY

Based on information reported by TGI, the water table along the site varied from a depth of 5.5 to 8 feet bgl during the site investigation. Based on Figure 3 of TGI's 1994 report, the water table elevation ranged from 793.00 feet to 793.65 feet between May 14 and July 13, 1993. Based on

groundwater elevations collected by NTH on September 4, 1995, the groundwater elevation across the site ranged from 791.31 feet to 792.41 feet. Using September 1995 groundwater information, we prepared a groundwater elevation contour map presented as Plate 5.

The elevation of groundwater relative to the bottom of the peat layer is expected to pose certain unique challenges for the remediation. Since the groundwater elevation occurs below the peat layer at some locations, the impacted soils (unsaturated zone) may extend below the peat layer. Therefore, the peat layer hydraulically divides the unsaturated zone into three sub-zones; the peat layer and a sub-zone above and below the peat layer. This may require the installation of separate remediation sub-systems for each sub-zone.

Different monitoring wells were measured by TGI at different time spans in order to establish the ground-water flow direction and the hydraulic gradient. Following is the summary of the readings measured at the site by TGI:

GROUNDWATER FLOW DIRECTION DATA (FROM TGI)			
Date	**Wells Measured**	**Direction of Groundwater Flow**	**Hydraulic Gradient (observed in ft/ft)**
07/01/92	MW-4, MW-5, MW-6	N 75° 22" W	0.00220
05/14/93	MW-5, MW-6, MW-7	N 13° 49" W	0.00141
07/13/93	MW-5, MW-6, MW-7	N 11° 28" W	0.00141

The site lies in a 100- year flood plain within the Allen Creek drainage basin. Allen Creek Drain serves as the main storm sewer for the City of Ann Arbor. The main branch of Allen Creek Drain enters the site from the south heading north, turns northwest and then again turns towards the north in the middle of the site.

3.3 CONTAMINANT DISTRIBUTION

During previous and current investigations, the soil and groundwater samples were analyzed for indicator parameters of gasoline; Benzene, toluene, ethyl benzene and xylene (BTEX), methyl tert butyl ether (MTBE), polynuclear aromatics (PNAs), and lead. The following methods were applied for the analysis:

- BTEX and MTBE Method 8020
- PNAs Method 8310
- Total Lead Method 7421 (furnace)

Based on the results of this testing, we estimated the extent of the impacted soil and groundwater in accordance with Tier 1 Residential Cleanup Criteria.

The concentrations of VOCs and PNAs detected in the soil and groundwater samples tested by NTH are summarized in Tables 1 and 2 in Appendix B. The concentrations of VOCs and PNAs detected in the soil and groundwater samples tested by TGI are summarized in Tables 3 and 4 in Appendix B. Comparison of the parameter concentrations with the Part 213 Tier I criteria, also summarized in Tables 1 through 4, reveals several compounds which exceed one or more criteria.

3.3.1 Extent of Petroleum Impacted Soil

During the NTH investigation, as shown on the boring logs provided in Appendix A, positive field screened HNu readings were reported for most of the collected soil samples. Typically, the HNU values ranged from 50 ppm to 400 ppm in the vadose zone soils and then decreased significantly, ranging from <1 ppm to 5 ppm, with increasing depth.

No regulated substance was detected in the soil samples analyzed at a concentration which exceeded Tier I direct contact criteria, except for a single sample collected from a depth of 5.0 feet below ground surface (bgs). This sample, collected from test boring TB-5, contained

benzo(a)pyrene at 1800 μg/kg, which slightly exceeds its Tier I direct contact criterion of 1400 ug/kg. However, the benzo(a)pyrene concentration of 1800 ug/kg does not exceed the Tier I soil threshold for leachate testing for groundwater protection, that is, 3700 ug/kg.

In contrast however, several compounds were detected in the soil with concentrations exceeding the Tier I leachate threshold levels, including benzene, ethyl benzene, xylenes, and acenaphthalyene. In addition, naphthalene was detected in a single soil sample (AH1 at 4-6 feet bgs) at 5600 ug/kg, which slightly exceeds the Tier I leachate threshold of 5500 ug/kg. Benzene was detected in several soil samples with levels exceeding the leachate threshold criterion of 100 ug/kg, including subsurface samples from AH-1, MW-8, AH-4, MW-10, TB-1, TB-2 , TB-3, and TB-4. Ethyl benzene was detected with concentrations in excess of the leachate threshold in subsurface soil samples from MW-8, AH-4, TB-1, TB-2, TB-3, TB-4, and TB-5. Xylenes were detected with total concentrations exceeding the leachate threshold in samples collected from MW-8, TB-3, and TB-4. Although MTBE was not detected in concentrations exceeding Tier I direct contact criterion, the levels of detection reported for the analyses were too high to determine compliance with the leachate threshold level. Acenaphthalene was detected at 3700 ug/kg in a subsurface soil sample obtained from AH-1; this concentration exceeds the leachate threshold level of 1400 ug/kg.

Review of previous chemical data collected east of the Allen Creek Drain did not reveal any concentrations in excess of the newly promulgated RBCA Tier I criteria. Based on this, no soil remediation is planned east of the Allen Creek Drain.

Using benzene as an indicator parameter, an approximate extent of the petroleum impacted soil in excess of MDNR's RBCA Tier I (leaching to groundwater) soil cleanup criteria is shown on Plate 6, Extent of Soil Contamination Plan. Plate 6 was based on the previous data collected by TGI and recent chemical data collected by NTH during the pilot study.

Samples collected from boring AH17-1, and AH17-2 located south and east of the former tank area, detected PNA (total) concentrations at shallow depths. However, these PNA concentrations appear are below the respective Tier I cleanup criteria, and will not require remediation.

3.3.2 Extent of Petroleum Impacted Groundwater

Comparison of the results of groundwater analysis with the Tier I criteria provided in Tables 2 and 4 reveals that the BTEX compounds, MTBE , and several PNA compounds were present in one or more groundwater samples with concentrations exceeding one or more of the Tier I groundwater criteria. Benzene was detected with levels exceeding Tier I criteria in water samples collected from MW-1, AH-1, AH-2, AH-771, MW-6, MW-8, AH-4, P-1, P-2, P-3, MW-6, and MW-11. It is noted that water samples which contained elevated benzene from MW-8 and AH-4 were collected during drilling using a screened auger. Consequently, the results may be skewed by the presence of suspended particulates. When MW-8 was resampled following development and purging, benzene was not detected, nor were any other analytes.

Toluene was detected with levels above Tier I groundwater criteria in samples collected from MW-1, MW-8, AH-4, P-1, and P-2. Ethyl benzene was detected with increased concentrations in samples collected from MW-1, AH-1, MW-6, MW-8, AH-4, MW-11, P-1, P-2, P-3, and MW-6, while xylenes were detected in MW-1. AH-1, AH-2, AH-762, MW-6, MW-8, AH-4, MW-11, P-1, P-2, P-3, and MW-6. While not analyzed for all water samples, MTBE was detected in P-1 with a concentration exceeding Tier I groundwater criteria.

One or more PNAs were detected with concentrations exceeding the Tier I groundwater criteria from the following locations; MW-1, AH-1, AH-2, MW-6, MW-8, and AH-4. The PNAs detected included naphthalene, acenaphthylene, acenaphthene, phenanthrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, dibenzo(a,h)anthracene, benzo(ghi)perylene, and indeno(1,2,3-cd)pyrene.

Review of the previous data collected by TGI on the east site of the Allen Creek Drain did not indicate the presence of petroleum impacted groundwater in excess of the MDNR RBCA Tier I cleanup criteria, thus, no remedial activities are planned in this area.

Based on review of the data collected by TGI and NTH, the extent of the petroleum impacted groundwater was generally delineated. The maximum depth of contamination was detected near auger probe location AH-4 at an approximate depth of 30 feet bgs. Using benzene as an indicator parameter, the approximate lateral extent of petroleum impacted groundwater is illustrated in Plate 7, Extent of Groundwater Contamination Plan.

3.3.3 Free Product Distribution

Free product was detected during TGI's investigation in MW-1 and MW-10. In March 1993, the thickness of the product in MW-1 was approximately 33 inches. In June 1993, a free product removal system was installed by TGI in MW-1. Due to the installation of the product removal system, accurate measurements of the free product thickness in MW-1 is not feasible. Free product measurements by NTH in MW-10 ranged from 14.5 inches in April 1995 to 10 inches in September 1995. Free product was not detected in the remaining monitoring wells which were each checked for free product with an electronic interface probe prior to sampling in September 1995. It appears that free product has spread beyond the source area in the direction of groundwater flow. Interim free product recovery has been initiated by NTH in late 1995.

4.0 PILOT STUDIES

4.1 INTRODUCTION

A series of pilot studies was conducted at the City of Ann Arbor, 415 West Washington Street to evaluate the following remediation technologies:

- Pump and Treat (P & T).
- Pump and treat and soil vapor extraction (P&T and SVE).
- Pump and treat, soil vapor extraction and air sparging (P&T, SVE and AS).
- Bioventing (BV)

The data collected during the pilot study were analyzed to evaluate flow characteristics of groundwater or air (permeability), the rate of biological oxygen consumption in the unsaturated zone and the radius of influence of the technologies evaluated. The data from the pilot tests and the results from the analysis are presented in the following sections.

4.2 PUMP TEST

The following approach was followed in the groundwater pumping test:

- The SVE-1 well was used as the pumping well. The pumping well was pumped at five constant rates. Each succeeding rate was higher than the previous pumping rate. The pumping rates and their associated duration are shown in Table 4.1.

- The hydraulic response of the groundwater system to pumping was monitored at several locations including piezometer nests P-1, P-2, P-3 and monitoring well MW-10. These monitoring points were located at different distances and at different directions around the pumping well. At the piezometer nest locations the hydraulic response was monitored at two depths. The locations of these monitoring points are shown in Plate 2 and their distances from the pumping well, depth below ground and screened interval are included in Table 4.2. The monitoring field data including time, draw down, and pumping rate were

summarized in tables and were used to determine the aquifer hydraulic properties. These data are presented in Appendix C.

TABLE 4.1

PUMPING CONDITIONS
STEP DRAW-DOWN PUMPING TEST
415 WASHINGTON STREET
ANN ARBOR, MICHIGAN

Pumping Rate (GPM)	Incremental Increase (GPM)	Duration (minutes)
2	2	74
5	3	68
11	6	78
17.4	6.4	72
18.8	1.4	114

TABLE 4.2

PHYSICAL SETTING OF PIEZOMETERS AND MONITORING WELLS
GROUNDWATER PUMPING TEST
415 WASHINGTON STREET
ANN ARBOR, MICHIGAN

Monitoring Location	Distance From Pumping Well (feet)	Depth Below Ground (feet)	Screened Interval (feet)
Well SVE- 1	0	19.3	15
Piezometer P- 1	25	15.0,20.0	2
Piezometer P-2	12	15.0,20.0	2
Piezometer P-3	5	15.0,20.0	2
Well MW- 10	52	9.0	5

- During the execution of the pump test, three water samples, referred to as WS-1, WS-2, and WS-3, were collected from the pumping well and tested for BTEX, MTBE, PNAs, and total and dissolved lead. Sample WS-1 was collected just prior to the start of pumping operations. Samples WS-2 and WS-3 were collected at later stages during pumping operations. The results of the chemical testing for these three samples are presented in Table 2 of Appendix B and are discussed later in this section.

- The equation that describes radial flow to a pumping well was solved graphically to determine the transmissivity (T), storativity (S), and hydraulic conductivity (K) for several sets of data from the monitoring locations. Although the project site is not completely homogeneous and isotropic, this method provides a reasonable approximation for the water-bearing soils at the site. The hydraulic properties were estimated by analyzing the pump test results using Theis Method and Cooper-Jacobs method for piezometers P-1, P-2, and P-3. In addition, the radius of influence (R) was determined by plotting and analyzing the drawdown versus radial distance data for the three piezometers. These graphical solutions are included in Appendix C. The results for T, S, and K are summarized in Table 4.3. The radius of influence is discussed below.

Radius of Influence: Based on the graphical analysis of drawdown versus log radial distance for Piezometers P-1 through P-3, a representative value for the radius of influence for a well being pumped at 18.8 gpm is 114 feet.

Hydraulic Properties (water): As shown on Table 4.3, the values for hydraulic conductivity (K) range from 3.8×10^{-2} cm/sec (108 ft/day) to 7.0×10^{-2} cm/sec (198.8ft/day) with an average value of 5.4×10^{-2} cm/sec (153.9 ft/day). These values are relatively higher than the average hydraulic conductivity of 2.5×10^{-5} cm/sec reported by TGI. The transmissivity (T) ranged from 3456.0 ft^2/day to 6360.5 ft^2/day and averaged 4911 ft^2/day. The storativity (S) ranged from 1.4×10^{-4} to 1.9×10^{-4} and averaged 1.65×10^{-4}.

Concentration Of Contaminant: Based on the results of the chemical testing completed on the three groundwater samples collected from the recovery well (SVE-1), the concentration of contaminants was reduced significantly during the pumping operations. For example, the concentration of benzene in Sample WS-1 collected prior to pumping was 400 ppb. Approximately three hours after pumping, Sample WS-2 was collected and the benzene concentration of this sample dropped to 220 ppb. After 7 hours of pumping, sample WS-3 was collected and the benzene concentration in this sample dropped to 69 ppb.

TABLE 4.3
SUMMARY OF AQUIFER HYDRAULIC PROPERTIES
STEP DRAWDOWN PUMP TEST
415 WASHINGTON STREET
ANN ARBOR, MICHIGAN

Monitoring Location	Theis			Cooper- Jacob		
	T ft^2/d	S	K ft/d	T (ft^2/d)	S	K (ft/d)
Piezometer P-1	6337.4	$1.0x10^{-4}$	198.0	--	--	--
Piezometer P-2	--	--	--	6360.5	$1.9x10^{-4}$	198.8
Piezometer P-3	3490.6	$1.4x10^{-4}$	109.1	3456.0	$1.4x10^{-4}$	108.0

4.3 SOIL VAPOR EXTRACTION TEST

In this pilot test, SVE was accompanied with pumping to draw down the water level in the well and avoid up welling as the vacuum was applied on the same well. The following approach was used in this combination pilot test:

- The SVE-1 well was pumped at two consecutive pumping rates. The pumping rates and their associated duration are shown below (total pumping duration = 255 minutes):

Fluid Pumping Rate (gpm)	Duration (minutes)
10.8	105
19.4	150

- After about 40 minutes of the start of groundwater pumping, the soil vapor extraction was started at the same well. The various air flow rates that were used are compiled in the following table:

Air Extraction Rate (scfm)	Duration (minutes)
12.3	20
14.7	65
15.1	65

- The response of the groundwater/air system was monitored at P-2 and P-3 piezometer locations. In the piezometer units occurring within the unsaturated soils, the air flow was monitored. In piezometer units occurring within the saturated soils, groundwater drawdown was monitored. At SVE-1 well, air flow and suction were monitored. The field data

collected during the test were compiled to generate tables that were used to analyze the data. These tables are included in Appendix D.

- The equations that describe radial flow to a pumping well were solved graphically to determine the transmissivity (T), storativity (S), and air conductivity (K) for several sets of data from the monitoring locations. As an approximation, we have used the graphical

solution for radial groundwater flow to a pumping well to represent radial air flow. The properties were estimated for Piezometer P-3 using Theis method and Cooper-Jacobs method. In addition, the radius of influence (R) was determined by plotting and analyzing the pressure decrease versus radial distance data for piezometers P-2 and P-3. These graphical solutions are included in Appendix D. The results of T, S, and K are summarized in Table 4.4. The radius of influence is discussed below.

TABLE 4.4

SUMMARY OF AQUIFER HYDRAULIC PROPERTIES
COMBINED SOIL VAPOR EXTRACTION AND PUMP TEST
415 WASHINGTON STREET
ANN ARBOR, MICHIGAN

Monitoring Location	Theis			Cooper Jacob		
	T (ft^2/d)	S	K (ft/d)	T (ft^2/d)	S	K (ft/d)
Piezometer P-3	256.2	4.0×10^{-1}	32.0	284.5	3.2×10^{-1}	35.6

Radius of influence: The analysis of the radial distance vs. vacuum level plot for Piezometers P-2 and P-3 resulted in the radius of influence R = 28 feet from the SVE well at time equal to 60 minutes, vacuum of 26 inches of water, and air flow rate of 14.7 scfm.

Hydraulic Properties (air in unsaturated zone): As shown on Table 4.4, the values for air conductivity ranged from 1.1 x 10^{-2} cm/sec (32.0 ft/day) to 1.2 x 10^{-2} cm/sec (35.6 ft/day) and averaged 1.2 x 10^{-2} cm/sec (33.8 ft/day). The transmissivity (T) ranged from 256.2 ft^2/day to 284.5 ft^2/day and averaged 270 ft^2/day. The storativity (S) ranged from 3.2 x 10^{-1} to 4.0 x 10^{-1} and averaged 3.6 x 10^{-1}.

4.4 AIR SPARGING TEST

This test involved the combination of three technologies: air sparging, soil vapor extraction to capture the sparged air, and groundwater pumping to control mounding that results from air sparging. The test was conducted to evaluate the optimum groundwater pumping rate, air injection rate and air extraction rates for the pilot study that can be applied for the site remediation.

- Water was pumped form the SVE-1 at 17.67 gpm and after 30 minutes of pumping, a vacuum was applied at the same well. Groundwater pumping was conducted to lower the water table and avoid up welling in the recovery well during soil vapor extraction and air sparging. After 65 minutes of the start of the test, air sparging was applied through the air sparging well (AS-1). The air injection rates and duration are summarized below

Air Injection Rate (scfm)	Duration (minutes)
1.72	60
3.85	50
6.09	40

- The response of the groundwater/air system due to the combination of pumping, soil vapor extraction and air sparging was monitored at piezometers P-1 through P-3. These piezometers were located in different directions and at different distances from the air sparging well in order to monitor the spatial response of the groundwater system. The locations of these monitoring points are shown in Plate 2, and their distance from the air sparging well are summarized in Table 4.5.

- The equations that describe radial flow to a pumping well were solved graphically to determine the transmissivity (T), storativity (S), and air conductivity (K) for data from piezometer P-2. As an approximation we have used the graphical solution for radial groundwater flow to a pumping well to represent radial air flow. In addition, the radius of influence (R) was estimated by plotting and analyzing the results of drawdown versus log radial distance. These graphical solutions are included in Appendix E. The results for T, S , and K are summarized in Table 4.6. The radius of influence (R) is discussed below.

Radius of influence: Based on the graphical analysis of pressure level vs log radial distance at time = 49 minutes and injection rate of 1.72 scfm, the estimated effective radius of influence is about 17 feet from the air sparging well.

Hydraulic Properties (air in saturated zone): As shown on Table 4.6, on the basis of the graphical analysis by applying Theis and Cooper Jacobs approaches, the air conductivity ranged from 4.6 x 10^{-3} cm/sec (13.2 ft/day) to 5.0 x 10^{-3} cm/sec (14.2 ft/day) and averaged 4.8 x 10^{-3} cm/sec (13.7 ft/day).

TABLE 4.5

PHYSICAL SETTING OF PIEZOMETERS AND MONITORING WELLS AIR SPARGING TEST 415 WASHINGTON STREET ANN ARBOR, MICHIGAN

Monitoring Location	Distance From Air Sparging Well (feet)
Piezometer P-1	20.5
Piezometer P-2	11.0
Piezometer P-3	6.9

TABLE 4.6

SUMMARY OF AQUIFER HYDRAULIC PROPERTIES PUMPING, SOIL VAPOR EXTRACTION, AND AIR SPARGING TEST 415 WASHINGTON STREET ANN ARBOR, MICHIGAN

Monitoring Location	Theis			Cooper Jacob		
	T (ft^2/d)	S	K (ft/d)	T (ft^2/d)	S	K (ft/d)
Piezometer 2	423.9	$6.5x10^{-3}$	13.2	455.9	$5.5x10^{-3}$	14.2

4.5 BIOVENTING TEST

A bioventing pilot test was conducted at the site. The purpose of the test was to determine the biodegradation rate of the gasoline-impacted soil in the unsaturated zone. A secondary purpose of this test was to determine the radius of influence of the air injected into the biovent well.

Air was continuously injected into the soil from the bioventing well BV-1 for three weeks at a flow rate of approximately 1 scfm and an injection pressure less than 2 psi. During injection and following the completion of the injection operations, the concentration of the carbon dioxide and oxygen were monitored at the bioventing well and piezometers P-1 through P-3. The results of the monitoring operations are summarized on Table 4.7. The amount of increase in carbon dioxide levels and decrease in oxygen levels provide information about the biodegradation rate of gasoline in the impacted soils.

Prior to the test, at the location of piezometers P-1 through P-3, soil oxygen gas concentrations ranged from 1 percent at the location of piezometer P-1 to 14 percent at the location of piezometer P-2 while carbon dioxide ranged from 1.5 percent at the location of piezometer P-2 to 10.5 percent at the location of piezometer P-3. The above results indicate an oxygen deficient soil due to the biodegradation occurring at the site.

Piezometers P-1 and P-3 responded to the bioventing operations. As shown in Table 4.7, following cessation of air injection operations, the concentration of carbon dioxide was increasing while the concentration of oxygen was reducing. This is an indication of gasoline biodegradation within the impacted soils. Piezometers P-1 and P-3 indicated similar soil gas oxygen and carbon dioxide levels in response to air injection. Using the data collected at Piezometer P-1 location, a biodegradation rate is determined. The soil gas oxygen level decreased from 16% to less than 1 % in the 96 hour monitoring period(6/01/95 to 6/05/95). The soil gas carbon dioxide level increased from 1% to 8% in the same period. During aerobic respiration, 3.1 lb. of oxygen is consumed per lb of hydrocarbon degraded. At an air injection rate of 1 scfm, the amount of oxygen injected into the soil is calculated as follows:

TABLE 4.7
SUMMARY OF MONITORING DATA
BIOVENTING TEST
415 WASHINGTON STREET
ANN ARBOR, MICHIGAN

Date	Sampling Time	Biovent Well		P1- at 5'		P2- at 5'		P3- at 5'		
		% O_2	% CO_2	% O_2	% CO_2	% O_2	% CO_2	% O_2	% CO_2	
5/10/95	14:00	6.5	2.5	1	4.5	14	1.5	2	10.5	Background Concentration
5/12/95	11:00	20.5	0	6.5	4.5	14	1	14.5	5	air inject
5/18/95	11:00	20.8	0	15.5	1.5	16.5	0	13.5	4.5	air inject
6/01/95	12:00	20.0	0	16	1	16.5	0.5	14.5	2	air off
6/02/95	11:00	14.5	0	7	4	13	2	13.5	4.5	air off
6/05/95	11:30	19.5	0.5	0	8	10.5	4.5	2	9	air off

1 scfm x 0.075 lbs/cf x 60 min/hr x 0.16 oxygen = 0.72 lbs/hr of oxygen.

The corresponding amount of hydrocarbon (HC) undergoing biodegradation is presented below:

0.72 / 3.1 lbs oxygen per lb of HC = 0.23 lbs/hr of HC.

The carbon dioxide levels do not indicate that all the oxygen was used for aerobic respiration so the actual amount of HC degradation is probably less than 0.23 lbs/hr.

At the degradation rate of 50% of the above calculated value, 0.12 lbs/hr of HC contamination is degraded. Using this value, the rate of HC degradation at this site due to bioventing is about 1/2 gallon of gasoline per day.

Piezometer P-2 responded to the air injection at the biovent well to a lesser degree than the other two piezometers. The soil gas measurements at the biovent well indicate that the soil at this point

of the site is no longer producing a significant rate of carbon dioxide. This may indicate that this particular volume of soil near the biovent well has been remediated to a degree.

Since piezometer P-1 is located approximately 10 feet from the bioventing well, it has been demonstrated that the radius of influence during bioventing is at least 10 feet.

In summary, the bioventing results indicate that intrinsic biodegradation is occurring in the petroleum-impacted soil at the site. It also appears that biodegradation through bioventing the vadose zone is a viable method to remediate the vadose zone.

4.6 SUMMARY OF PILOT TEST RESULTS

Based on the pilot studies completed and our knowledge of site conditions the design criteria shown on Table 4.8 were determined.

TABLE 4.8

SUMMARY OF PILOT TEST RESULTS
415 WASHINGTON STREET
ANN ARBOR, MICHIGAN

Type of Test	Radius of Influence (feet)	Hydraulic/Air Conductivity (cm/s)	Operating Conditions
Groundwater Pumping	114 (Saturated Zone)	5.4×10^{-2}	Pumping rate = 18.8 gpm
Soil Vapor Extraction (1)	28 (Vadose Zone)	1.2×10^{-2}	Vacuum = 26 inches of water and air flow rate of 14.7 scfm
Air Sparging (1)	17 (Saturated Zone)	4.8×10^{-3}	Air injection rate = 1.72 scfm
Bioventing	10 (Vadose Zone)	N/A	Injection rate = 1 scfm, biodegradation rate = 0.12 lb/hr

(1) As described in Sections 4.3 and 4.4, groundwater pumping was necessary to successfully implement this test

The results summarized in Table 4.8 will used in the development of a conceptual remediation system and will discussed in Section 5 of this CAP.

5.0 DESIGN OF REMEDIATION SYSTEM

5.1 INTRODUCTION

A feasibility analysis has been completed by NTH to identify the most appropriate remediation method. The feasibility study is presented in Appendix F. Based on the results of the study, the City decided to utilize active remediation methods (Alternative 1 in Appendix F), including pump and treat, soil vapor extraction, and air sparging. The design of this system is presented in this section.

The following design has been developed based on the site investigation data presented in Section 2; the extent of contamination requiring cleanup as determined by comparison with RBCA Tier One values presented in Section 3; and the results of the pilot tests presented in Section 4.

The soil and groundwater zones requiring cleanup are presented in Plates 6 and 7, respectively, and the specific contaminants and their concentration ranges are presented in Section 3. Generally, the contaminants of interest include benzene, toluene, ethyl benzene, the xylene isomers, MTBE and naphthalene.

As indicated in Section 2, a layer of peat traverses the site; the bottom elevation of the peat layer ranges from 790.25 to 792.50 feet. The contour plots of the top and bottom elevations of the peat layer are shown in Plates 3 and 4, respectively. The groundwater elevation during the 1995 NTH additional investigation study ranged from 791.31 to 792.40 feet. Since the bottom elevation of the peat layer and the water-table elevation do not slope in the same direction, the water table is likely to be higher than the base of the peat at some locations, and more so during wet, high recharge episodes.

The relative elevations of the bottom of the peat and the water table are important because they could impact the performance of the technologies evaluated at the site during the pilot test. In fact,

during the pilot test, although the water table was relatively lower than reported by TGI, pumping was necessary to successfully implement the soil vapor extraction and air sparging tests. The pumping is needed to prevent upwelling and to create an-unsaturated zone that will provide a medium for the sparged air to be extracted by the SVE system. Dewatering will also allow remediation of the "smear zone" by SVE, which is a more effective technology than air sparging.

In the following sections we present remediation designs for hydraulic containment of the plume and recovery of free product; remediation of the unsaturated zone above the water table, including above and below the peat layer; remediation of the saturated zone; and the treatment systems. During operations, the performance of the proposed remediation system will be evaluated and adjusted, based on the data collected as part of the monitoring program.

5.2 HYDRAULIC CONTAINMENT AND FREE PRODUCT RECOVERY SYSTEM

The objectives of this system are:

- Hydraulic containment of contaminated groundwater. This will be achieved by creating an adequate hydraulic gradient for the contaminated groundwater to flow to recovery wells to minimize the potential for migration which would increase the extent of the contaminated plume. The number and location of the recovery wells are based on several factors including the radius of influence of each well and the lateral extent of contaminated groundwater. The estimated extent of the contaminated groundwater is shown on Plate 7.

- Dewatering to maintain the water table below the bottom of the peat layer to facilitate the remediation of the soils above the water table by SVE, and to allow for the capturing the sparged air by the SVE system. It is pivotal to lower the water table beneath the peat layer to create an unsaturated sand zone to successfully implement SVE and to capture sparged air.

- Recovery of free-product. Although interim free product recovery has been initiated by NTH in late 1995, it is likely that further collection of residual free product will be required prior to full-scale remediation. This will be achieved by creating an adequate hydraulic gradient for the product to flow to recovery wells from which the product is pumped to the surface. The number and location of the recovery wells are based on several factors including the radius of influence of each well and the lateral extent of product spread.

Our objectives can be achieved by pumping water from up to three wells in a manner sufficient to create a water-table depression. Within the zone of contaminated groundwater, the water depression must have an elevation below the bottom of the peat layer and must create an inward gradient sufficient to maintain a capture zone of influence within the zone of interest.

The results of the pump test indicate that three recovery wells pumped at a rate ranging from 10 to 30 gpm with a total pumping rate ranging from 30 to 50 gpm is expected to create the needed water table depression. As shown on Plate 8, this will be accomplished using existing MW-1 well and two new wells to be installed.

The new dewatering/product recovery (DW/PR) wells will have a 10-ft long, 4-inch ID, PVC screen attached to a 4-inch PVC riser. The wells will be installed to a depth of about 17 feet and will be finished in a 2-ft wide by 2-ft long by 4-ft deep flush mounted manhole (Plate 9). Either a pneumatic pump with a product can or an electric submersible pump and a product scavenger pump will be installed in the well to recover and remove groundwater and product. The wellhead of MW-1 will be retrofitted to meet the specifications of the new well.

5.3 REMEDIATION OF THE UNSATURATED ZONE

Remediation of the unsaturated zone will be addressed by the combination of soil vapor extraction and bioventing methods. Because the peat layer, in effect, divides the unsaturated zone into three layers, we will use two combined SVE/BV wells in each borehole. The shallow SVE/BV well will

be screened about one foot into and one foot above the peat layer, while the deeper SVE/BV well will be screened four feet below the peat layer and about one foot into it from below. These wells will be constructed from 2-inch ID PVC screens and 2-inch ID PVC risers. The wells will finished in 2-ft long by 2-ft wide by 4-ft deep flush mounted manholes (Plate 10).

The results of the SVE pilot study indicates that a vacuum of 0.4 inch of H_2O will develop at a radial distance of 28 feet from an SVE/BV well that is under a vacuum of 26 inches of water and an air-flow rate of 15 scfm per well/trench. Based on these calculations, three SVE/BV well pairs and an SVE trench are proposed (see Plate 8). As shown on Plate 8, the zone of influence for the wells and the trench is expected to span the zone of soil contamination. As shown on Plate 8, the SVE trench will be located along the sides of the Parks and Recreation Building (P&RB). The extraction of air from the trench will minimize the potential for contaminated air to migrate towards the P&RB.

Bioventing will be accomplished by the air (oxygen) being drawn through the contaminated soil zone by the SVE system.

5.4 REMEDIATION OF THE SATURATED ZONE

In addition to the contributions of the DW/PR system to remediation of the groundwater zone, we will implement an air sparging system to accelerate remediation of this zone. Air sparging will contribute to the cleanup in two ways:

(1) Volatizing the BTEX from the groundwater and soil beneath the water table. These volatilized contaminants will be collected by the SVE wells in the unsaturated zone, and

(2) Injecting air within the saturated zone will also provide molecular oxygen to the groundwater and increase the level of dissolved oxygen in the groundwater. This additional

oxygen will become available for in-situ biodegradation of the targeted contaminants, MTBE and naphthalene, and will contribute to the remediation of the saturated zone.

The results of the air sparging pilot test indicate that an air injection rate of 1.72 scfm will create an effective zone of influence of 17 feet. Three AS wells are proposed to assist with the remediation of the impacted saturated zone shown in Plate 5, for a total flow rate of 6 scfm. One of the AS wells (AS-1) is already installed and was used during the pilot study. These AS wells will have overlapping radii of influence and their radius of influence will extend over the zone of highest groundwater contamination. As shown on Plate 8, the area of influence for the air sparging wells occurs within the area of influence for the SVE/BV wells. Therefore, the SVE system is expected to capture contaminated sparged air escaping the groundwater and to minimize the potential for migration of contaminated air to the P&RB.

The new AS wells will have a 2-ft long, 2-inch ID PVC screen connected to a 2-inch ID PVC riser. Both AS wells will be finished in 2-ft wide by 2-ft long by 4-ft deep flush mounted manholes (Plate 11).

5.5 MECHANICAL COMPONENTS

The three DW/PR wells will be connected to (1) a compressor to operate a pneumatic pump for the combined removal of free product and groundwater or (2) to a compressor to operate a product recovery pump per well and to a power supply to operate an electrical submersible pump for groundwater pumping. A water-level sensor will be located in each DW/PR well to maintain the water level at preset levels. Each wellhead will be instrumented with sampling ports for groundwater. The product and groundwater discharge lines will be insulated (with all other lines) in a trench extending below the frost line (3 to 4 feet bgl).

The SVE/BV wells will be connected to a regenerative blower to create the needed vacuum for each well. The AS wells will be connected to an air compressor capable of generating up to 5.0

scfm of air for injection into the saturated zone. Each wellhead will be instrumented with pressure or vacuum gauges, air sampling ports and a valve that will allow for independent control of each well.

All the aboveground instrumentation including compressor, regenerative blower, product/recovery holding tanks and treatment systems will be housed in an on-site treatment shed. The proposed location of this treatment building is shown in Plate 8.

5.6 TREATMENT SYSTEM

Based on an evaluation of the above-ground technologies the following treatment technologies are recommended for this site. Plate 12 illustrates the conceptual layout of the treatment system.

5.6.1 Groundwater Treatment

Groundwater containing dissolved phased gasoline constituents and mixed with free phase gasoline will be pumped from the DW/PR wells. An oil/water separator will be selected to handle a flow rate of up to 50 gpm. Since it is difficult to estimate the rate of free-product recovery, the system will be designed to collect the free product in a 55-gal DOT approved drum. This drum will be instrumented with a level sensor to shut the entire system down in the event that it becomes full. Initial monitoring data of the rate of free-product recovery will be used to optimize the product collection system.

Effluent will be passed through an air stripper prior to carbon treatment. Based on the concentration of BTEX, MTBE and naphthalene in the site's groundwater, the estimated maximum dissolved phase concentration of VOCs in the groundwater is 100 mg/L. As such, the carbon treatment system will be designed to treat groundwater containing a maximum of 100 mg/L dissolved contaminants.

5.6.2 Vapor Treatment

A vapor phase carbon system will be designed to treat the soil gas which will be extracted by the SVE system. The carbon treatment will also treat off-gas from the air stripper component of the groundwater treatment system. The combined air flow from the SVE system and air stripper is estimated to be 300 scfm.

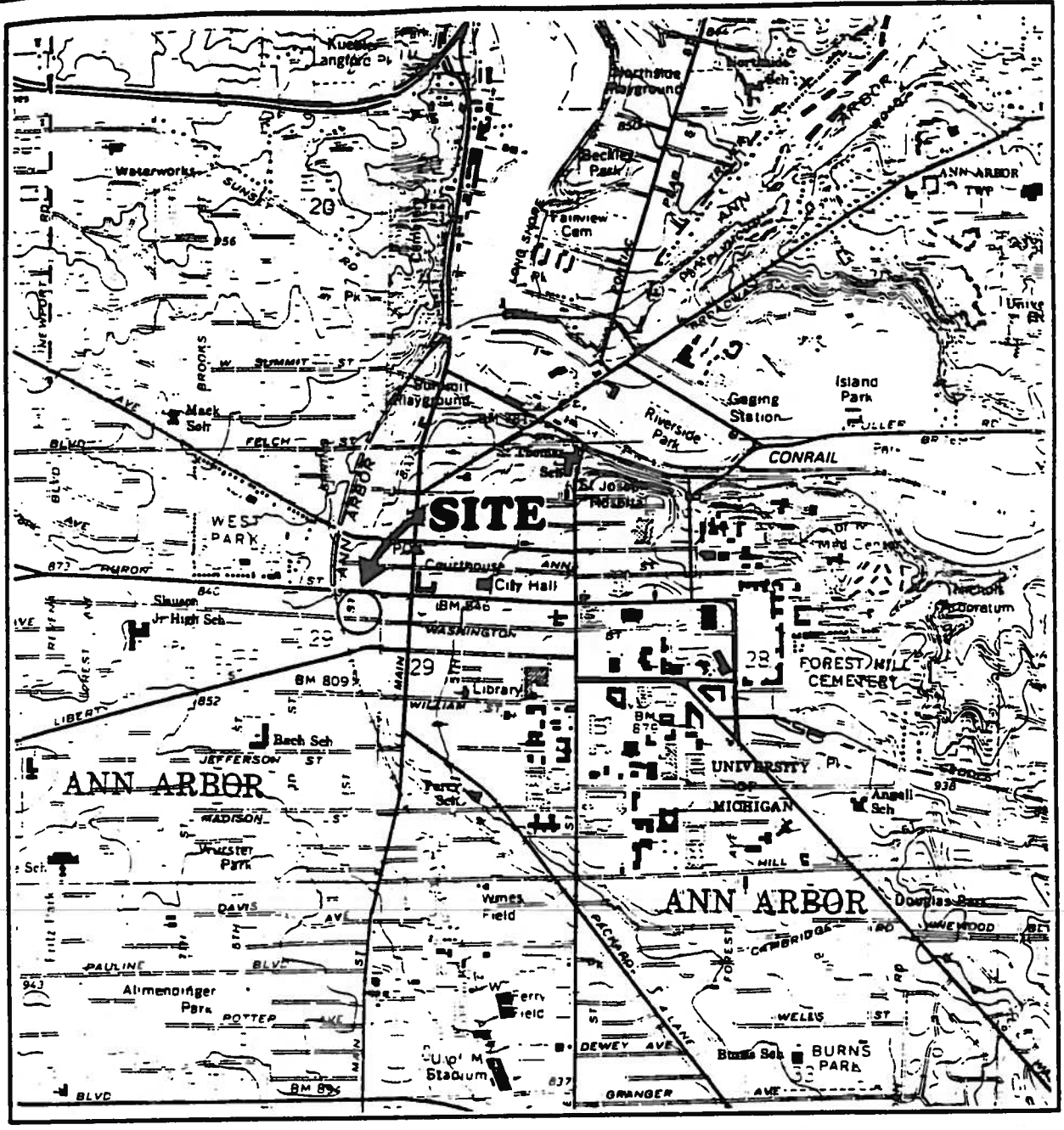
5.6.3 Discharge Permits

We will obtain a permit from MDEQ to discharge the treated air from the catalytic oxider. Discharge alternatives for the treated groundwater include: (1) discharge to surface water, (2) discharge to a public owned treatment works (POTW), and (3) re-injection of treated groundwater. The most feasible and cost-effective alternative appears to be discharge to surface water under an NPDES permit into Allen Creek Drain. It is anticipated that approval for re-injection of groundwater from the MDEQ will be difficult to obtain. Discharge to a POTW is technically feasible, but discussions with POTW personnel indicate that this is not a permanent option. Therefore, we have assumed that the discharge will be to surface water. Due to the nature of the contaminants, we have assumed that an NPDES general permit will be applicable for this site.

Furthermore, we will obtain a building permit for the treatment building and a flood plain, or floodway, development permit for the proposed remediation activities.

5.6.4 Schedule

The schedule for the construction and operation of the remediation system is shown on Plate 13. As shown on Plate 13, the construction of the system is expected to start 6/24/96 and the system operation is expected to start 8/9/96.



QUANDRANGLE LOCATION

NORTH

SITE LOCATION MAP

PARKS AND RECREATION GARAGE
CITY OF ANN ARBOR
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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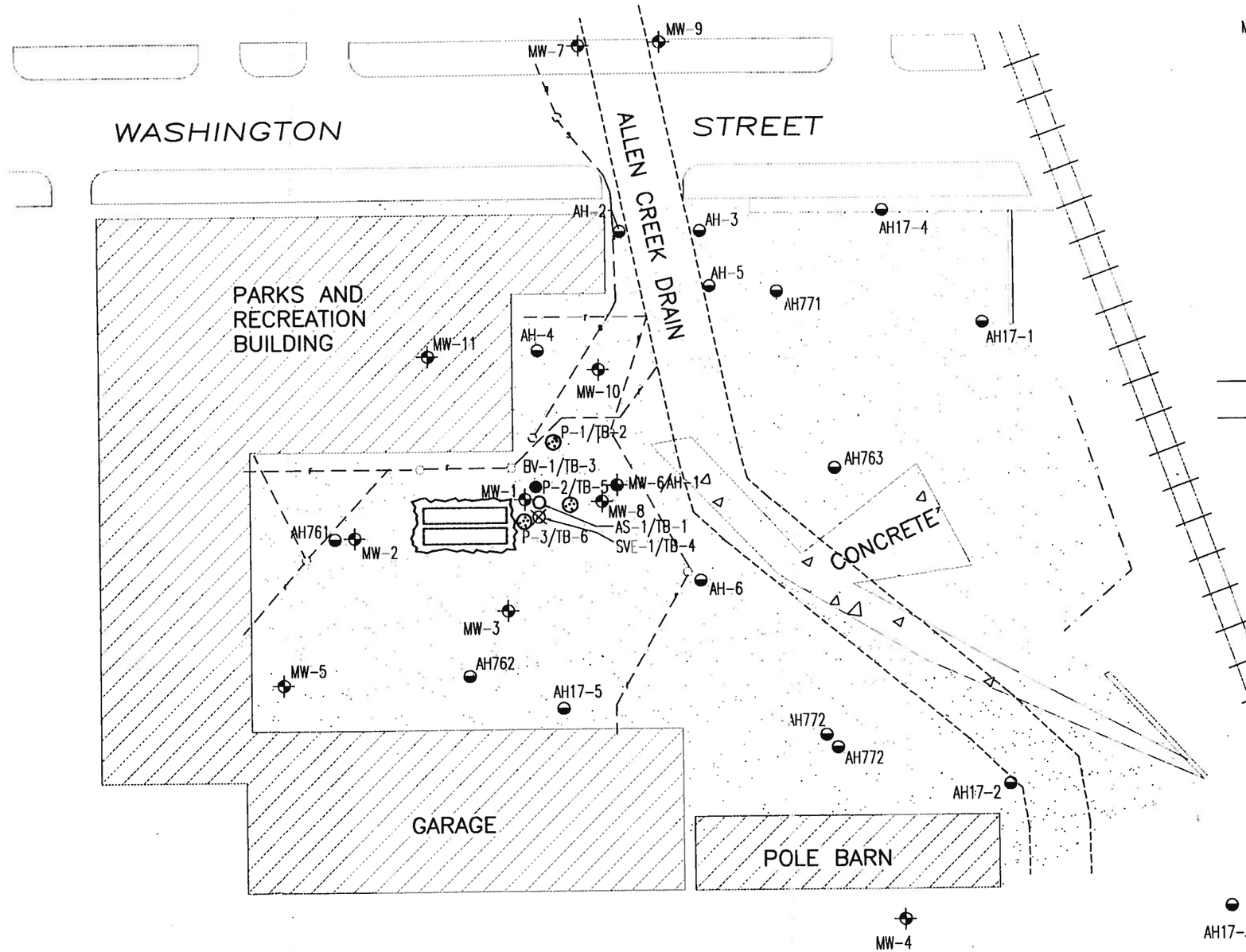

LEGEND:

- MW-1 — EXISTING MONITORING WELL INSTALLED BY THE TRAVERSE GROUP, INC. BETWEEN MARCH,1992 AND NOVEMBER,1993
- PREVIOUS SOIL BORINGS COMPLETED BY THE TRAVERSE GROUP, INC. BETWEEN MARCH, 1992 AND NOVEMBER, 1993.
- NESTED PIEZOMETER LOCATION (FROM NTH PILOT STUDY)
- AIR SPARGING WELL (FROM PILOT STUDY)
- BIOVENTING AIR INJECTION WELL (FROM NTH PILOT STUDY)
- SOIL VAPOR EXTRACTION/GROUNDWATER DEPRESSION WELL (FROM NTH PILOT STUDY)
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING STORM SEWER CATCH BASIN

NTH
NORTH

0 40 80
SCALE FEET

NOTE:
BASE MAP PROVIDED BY CITY OF ANN ARBOR AND WAS OBTAINED FROM THE TRAVERSE GROUP, INC. FEASIBILTY STUDY, DATED APPRIL 15, 1994.

WELL AND TEST BORING LOCATION PLAN

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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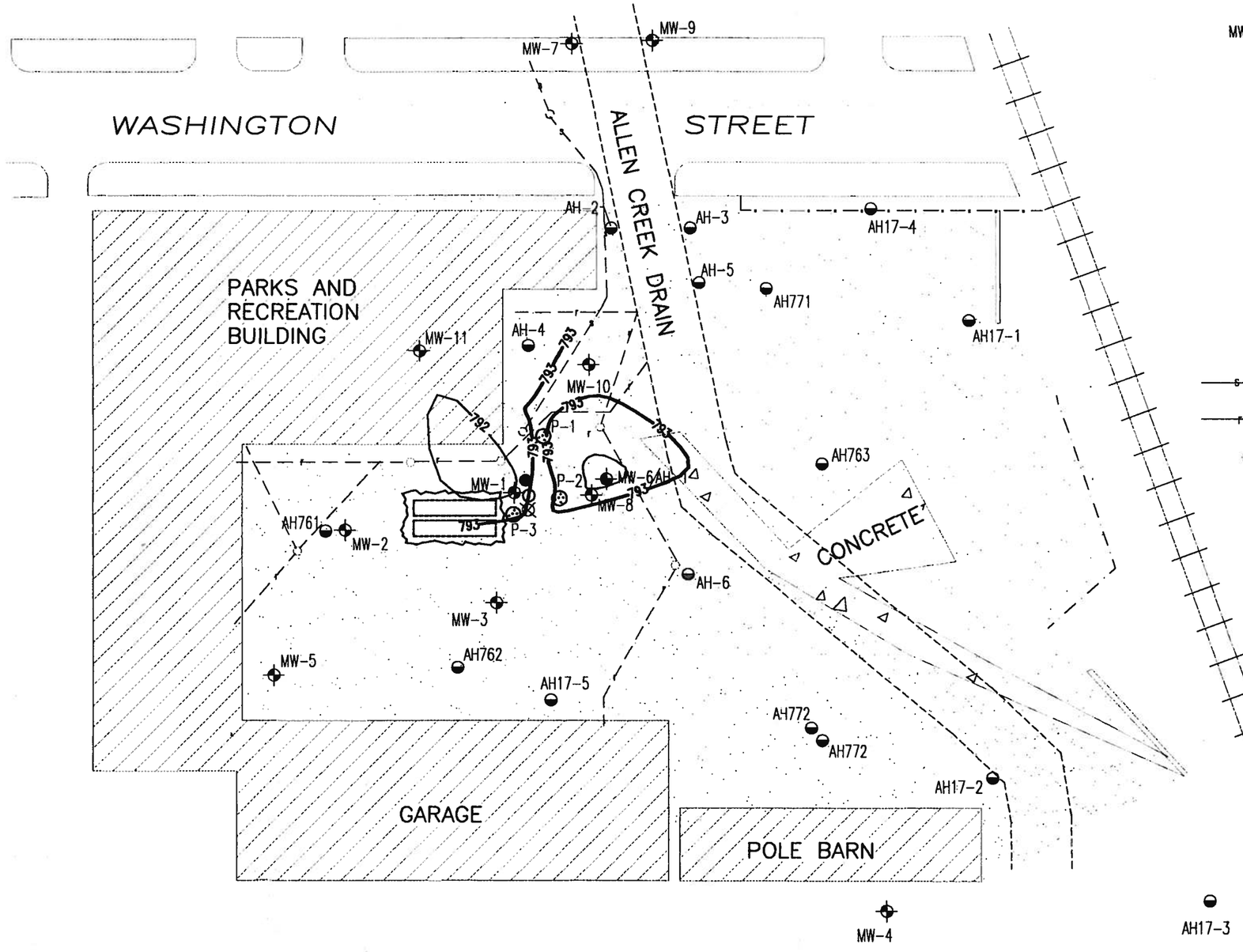

LEGEND:

- MW-1 — EXISTING MONITORING WELL INSTALLED BY THE TRAVERSE GROUP, INC. BETWEEN MARCH,1992 AND NOVEMBER,1993
- PREVIOUS SOIL BORINGS COMPLETED BY THE TRAVERSE GROUP, INC. BETWEEN MARCH, 1992 AND NOVEMBER, 1993.
- NESTED PIEZOMETER LOCATION (FROM NTH PILOT STUDY)
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- SOIL VAPOR EXTRACTION/GROUNDWATER DEPRESSION WELL (FROM NTH PILOT STUDY)
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING STORM SEWER CATCH BASIN

NTH
NORTH

0 40 80
SCALE FEET

NOTE:
1) BASE MAP PROVIDED BY CITY OF ANN ARBOR AND WAS OBTAINED FROM THE TRAVERSE GROUP, INC. FEASIBILTY STUDY, DATED APPRIL 15, 1994.
2) CONTOURS GENERATED USING TERRAMODEL CONTOUR FILE 5001TOP.DXF

TOP OF PEAT LAYER – ELEVATION CONTOURS

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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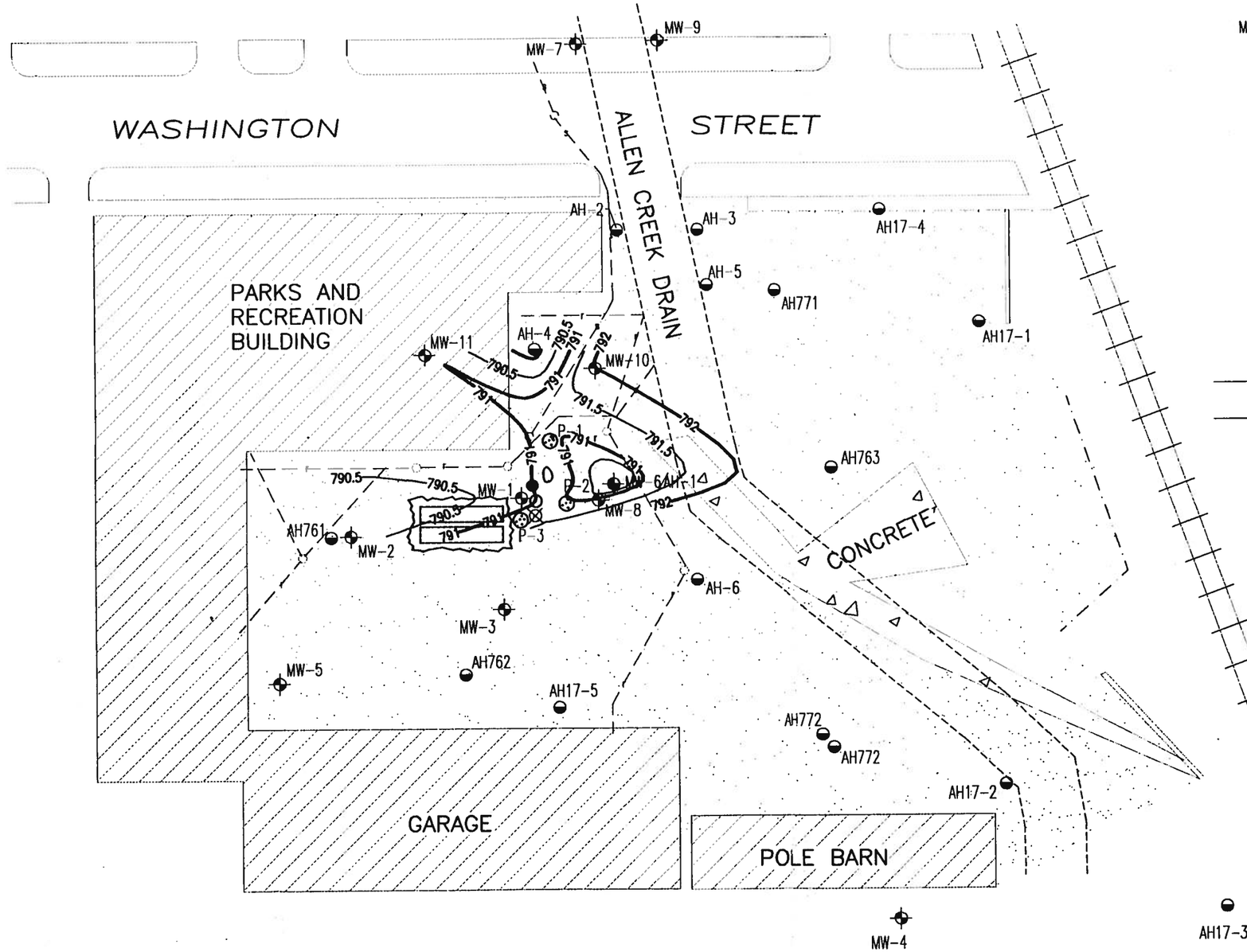

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- PREVIOUS SOIL BORINGS COMPLETED BY THE TRAVERSE GROUP, INC. BETWEEN MARCH, 1992 AND NOVEMBER, 1993.
- NESTED PIEZOMETER LOCATION (FROM NTH PILOT STUDY)
- AIR SPARGING WELL (FROM PILOT STUDY)
- BIOVENTING AIR INJECTION WELL (FROM NTH PILOT STUDY)
- SOIL VAPOR EXTRACTION/GROUNDWATER DEPRESSION WELL (FROM NTH PILOT STUDY)
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING STORM SEWER CATCH BASIN

NTH
NORTH

0 40 80
SCALE FEET

NOTE:
1) BASE MAP PROVIDED BY CITY OF ANN ARBOR AND WAS OBTAINED FROM THE TRAVERSE GROUP, INC. FEASIBILTY STUDY, DATED APPRIL 15, 1994.
2) CONTOURS GENERATED USING TERRAMODEL CONTOUR FILE 5001TOP.DXF

BOTTOM OF PEAT LAYER – ELEVATION CONTOURS

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
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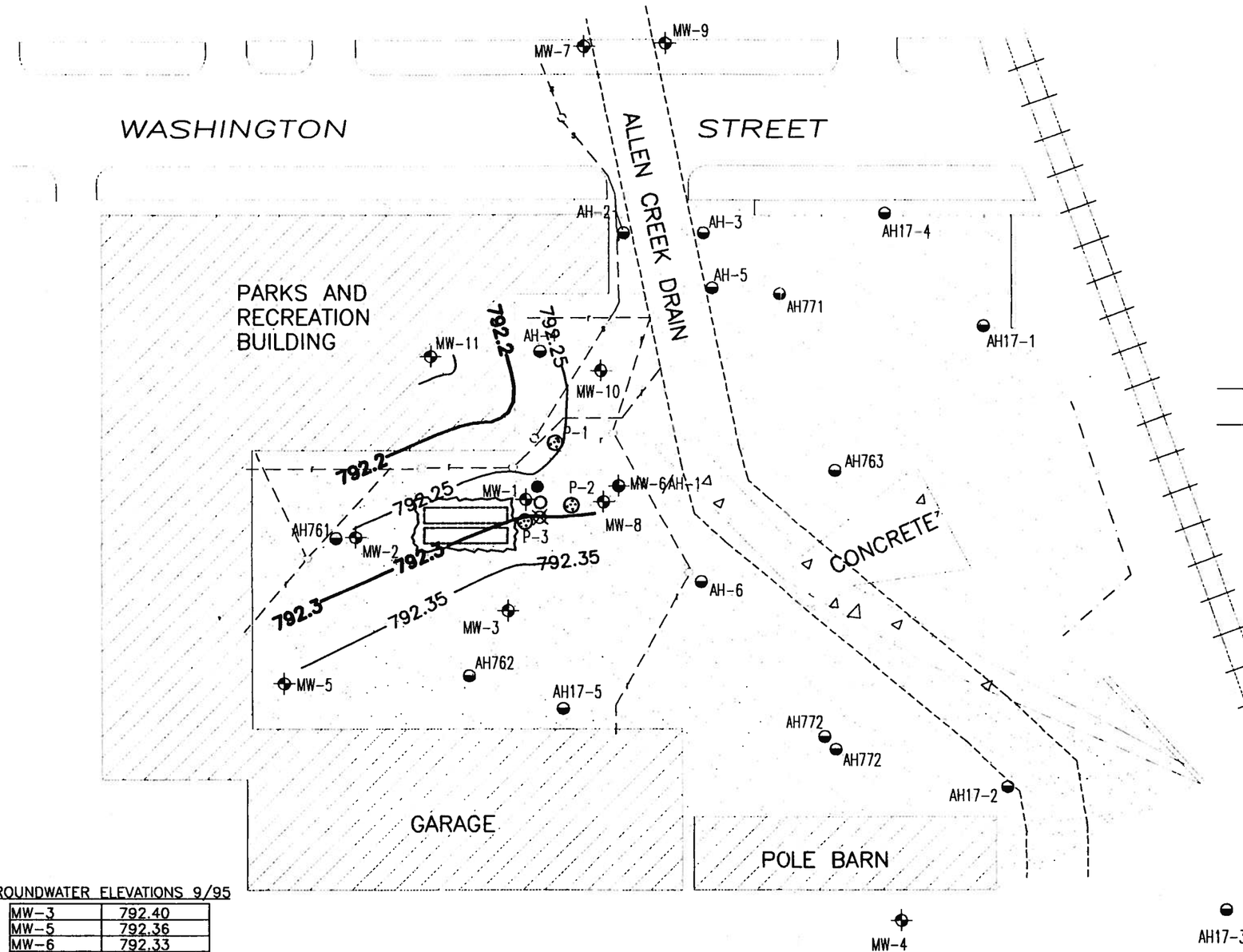

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- SOIL VAPOR EXTRACTION/GROUNDWATER DEPRESSION WELL (FROM NTH PILOT STUDY)
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING STORM SEWER CATCH BASIN

NORTH

0 40 80

SCALE FEET

GROUNDWATER ELEVATIONS 9/95

MW-3	792.40
MW-5	792.36
MW-6	792.33
MW-8	792.30
MW-10	792.20
MW-11	792.13
P-1	792.22
P-2	792.30
P-3	792.30
SVE-1	791.31
BV-1	792.26
AS-1	792.28

NOTE:

1) BASE MAP PROVIDED BY CITY OF ANN ARBOR AND WAS OBTAINED FROM THE TRAVERSE GROUP, INC. FEASIBILITY STUDY, DATED APPRIL 15, 1994.

2) CONTOURS GENERATED USING TERRAMODEL CONTOUR FILE 5001TOP.DXF

GROUNDWATER FLOW

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
13-5001-04	JD	08-23-95	5
SCALE: AS SHOWN	CHECKED BY: MJC	SHEET 1 OF 1	

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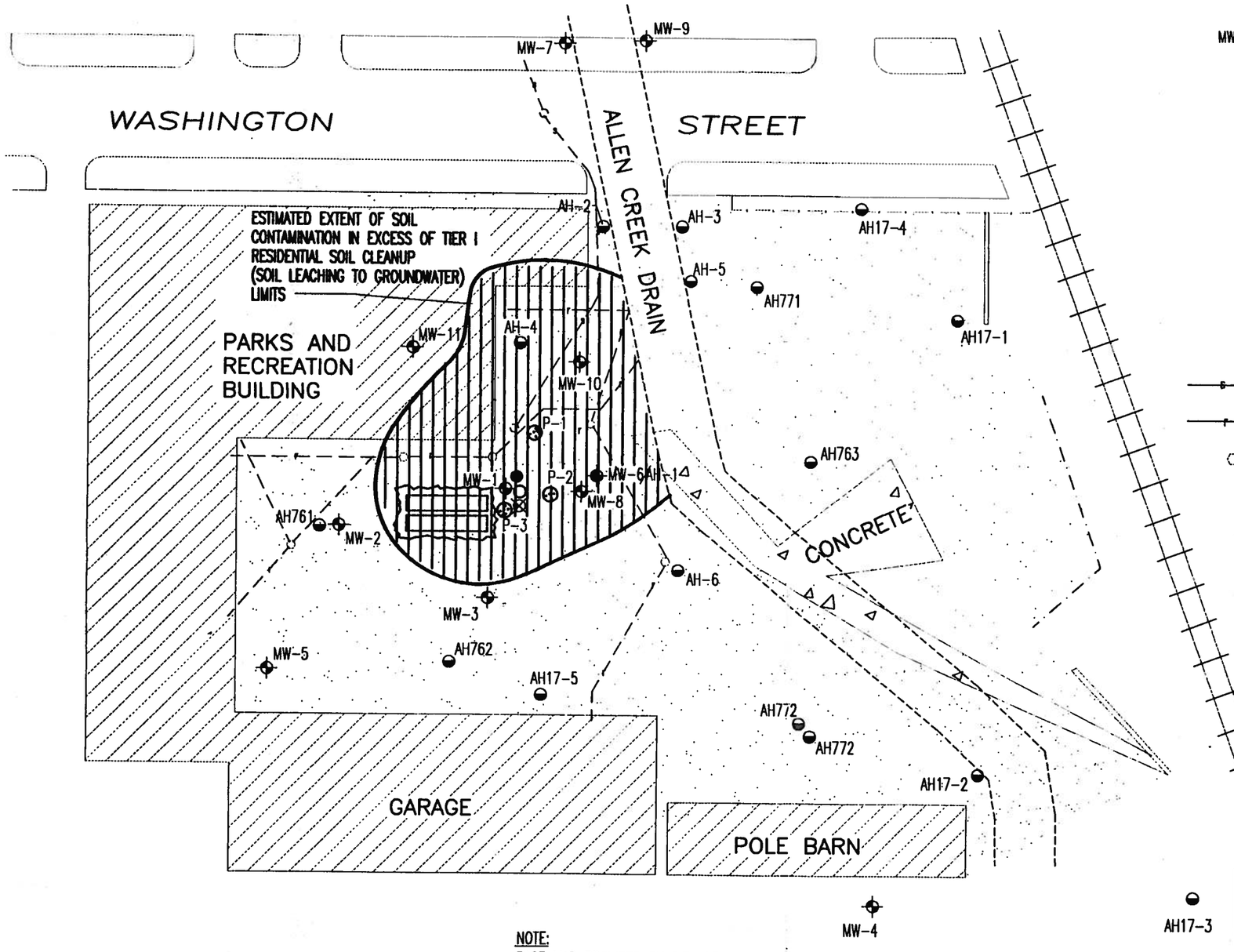

LEGEND:

- MW-1 — EXISTING MONITORING WELL INSTALLED BY THE TRAVERSE GROUP, INC. BETWEEN MARCH,1992 AND NOVEMBER,1993
- PREVIOUS SOIL BORINGS COMPLETED BY THE TRAVERSE GROUP, INC. BETWEEN MARCH, 1992 AND NOVEMBER, 1993.
- NESTED PIEZOMETER LOCATION (FROM NTH PILOT STUDY)
- AIR SPARGING WELL (FROM PILOT STUDY)
- BIOVENTING AIR INJECTION WELL (FROM NTH PILOT STUDY)
- SOIL VAPOR EXTRACTION/GROUNDWATER DEPRESSION WELL (FROM NTH PILOT STUDY)
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING STORM SEWER CATCH BASIN

NTH
NORTH

0 40 80
SCALE FEET

NOTE:
BASE MAP PROVIDED BY CITY OF ANN ARBOR AND WAS OBTAINED FROM THE TRAVERSE GROUP, INC. FEASIBILTY STUDY, DATED APPRIL 15, 1994.

EXTENT OF CONTAMINATION DERIVED FROM DATA COLLECTED BY THE TRAVERSE GROUP, INC. FROM MARCH 1992 THROUGH NOVEMBER 1993 AND FROM ANALYTICAL DATA COLLECTED BY NTH CONSULTANTS, LTD. FROM APRIL 6-12, 1995.

EXTENT OF SOIL CONTAMINATION

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
13-5001-03	JD	03-25-96	6
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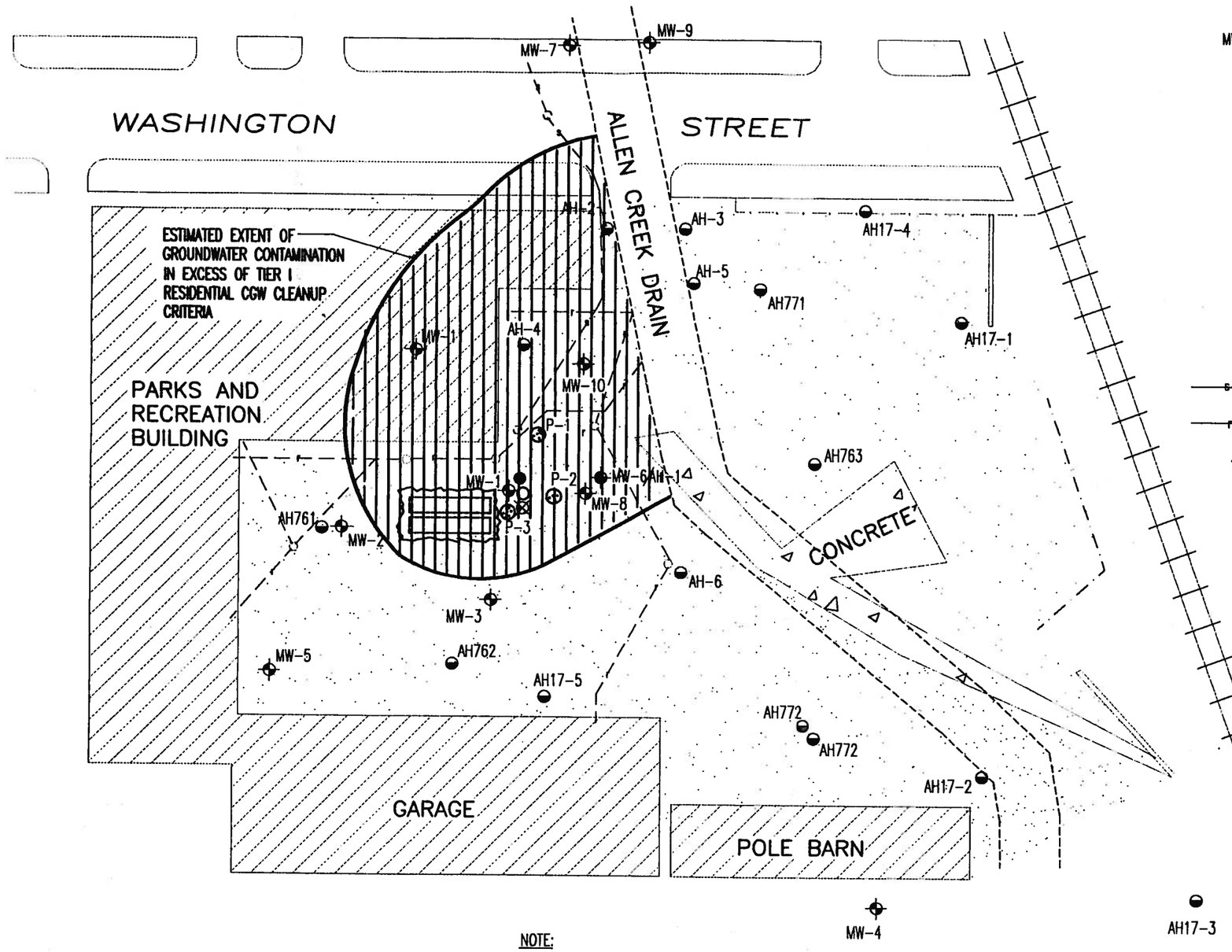

LEGEND:

- MW-1 — EXISTING MONITORING WELL INSTALLED BY THE TRAVERSE GROUP, INC. BETWEEN MARCH,1992 AND NOVEMBER,1993
- PREVIOUS SOIL BORINGS COMPLETED BY THE TRAVERSE GROUP, INC. BETWEEN MARCH, 1992 AND NOVEMBER, 1993.
- NESTED PIEZOMETER LOCATION (FROM NTH PILOT STUDY)
- AIR SPARGING WELL (FROM PILOT STUDY)
- BIOVENTING AIR INJECTION WELL (FROM NTH PILOT STUDY)
- SOIL VAPOR EXTRACTION/GROUNDWATER DEPRESSION WELL (FROM NTH PILOT STUDY)
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING STORM SEWER CATCH BASIN

NORTH

0 40 80

SCALE FEET

NOTE:
BASE MAP PROVIDED BY CITY OF ANN ARBOR AND WAS OBTAINED FROM THE TRAVERSE GROUP, INC. FEASIBILTY STUDY, DATED APPRIL 15, 1994.

EXTENT OF CONTAMINATION DERIVED FROM DATA COLLECTED BY THE TRAVERSE GROUP, INC. FROM MARCH 1992 THROUGH NOVEMBER 1993 AND FROM ANALYTICAL DATA COLLECTED BY NTH CONSULTANTS, LTD. FROM APRIL 6-12, 1995.

EXTENT OF GROUNDWATER CONTAMINATION

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
13-5001-03	JD	03-25-96	7
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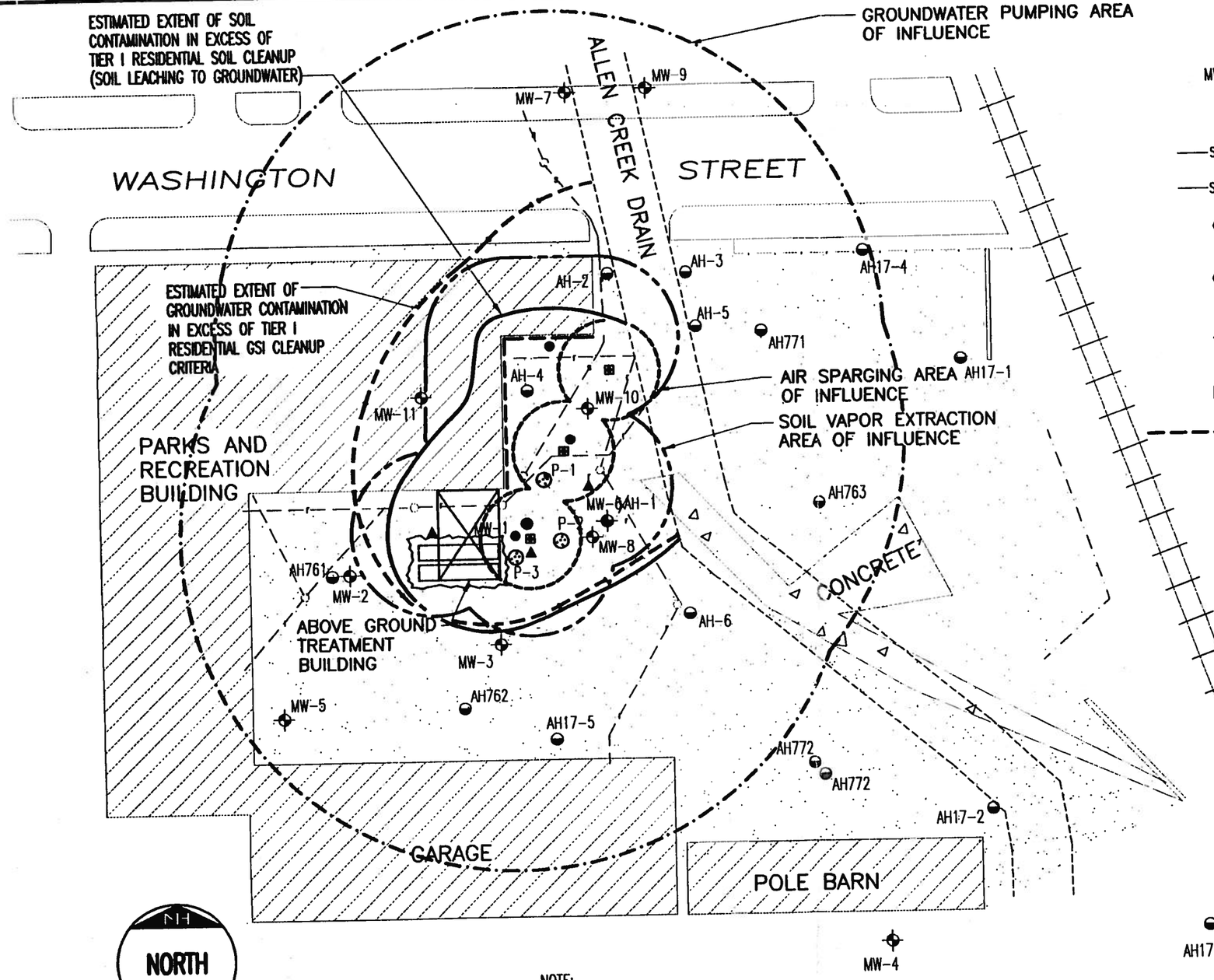
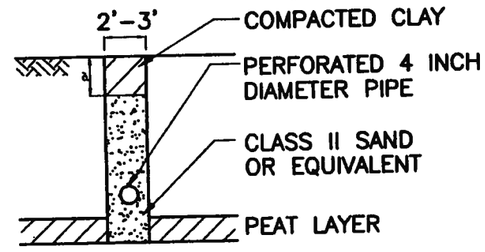


NOTE:
BASE MAP PROVIDED BY CITY OF ANN ARBOR AND WAS OBTAINED FROM THE TRAVERSE GROUP, INC. FEASIBILTY STUDY, DATED APPRIL 15, 1994.

EXTENT OF CONTAMINATION DERIVED FROM DATA COLLECTED BY THE TRAVERSE GROUP, INC. FROM MARCH 1992 THROUGH NOVEMBER 1993 AND FROM ANALYTICAL DATA COLLECTED BY NTH CONSULTANTS, LTD. FROM APRIL 6-12, 1995.

LEGEND:

- MW-3 — EXISTING MONITORING WELL INSTALLED BY THE TRAVERSE GROUP, INC. BETWEEN MARCH, 1992 AND NOVEMBER, 1993
- —S— EXISTING SANITARY
- —SS— EXISTING STORM SEWER
- EXISTING STORM SEWER CATCH BASIN
- 3- PUMPING/PRODUCT RECOVERY WELLS
- ▲ 3- PAIRS OF SVE/BV NESTED WELLS
- 3- AIR SPARGING (AS) WELLS
- PROPOSED SVE TRENCH



SVE TRENCH DETAIL

NOTE:
BASE MAP PROVIDED BY CITY OF ANN ARBOR AND WAS OBTAINED FROM THE TRAVERSE GROUP, INC. FEASIBILTY STUDY, DATED APRIL 15, 1994.

LAYOUT OF REMEDIATION SYSTEM

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
13-5001-03	JD	03-25-96	8
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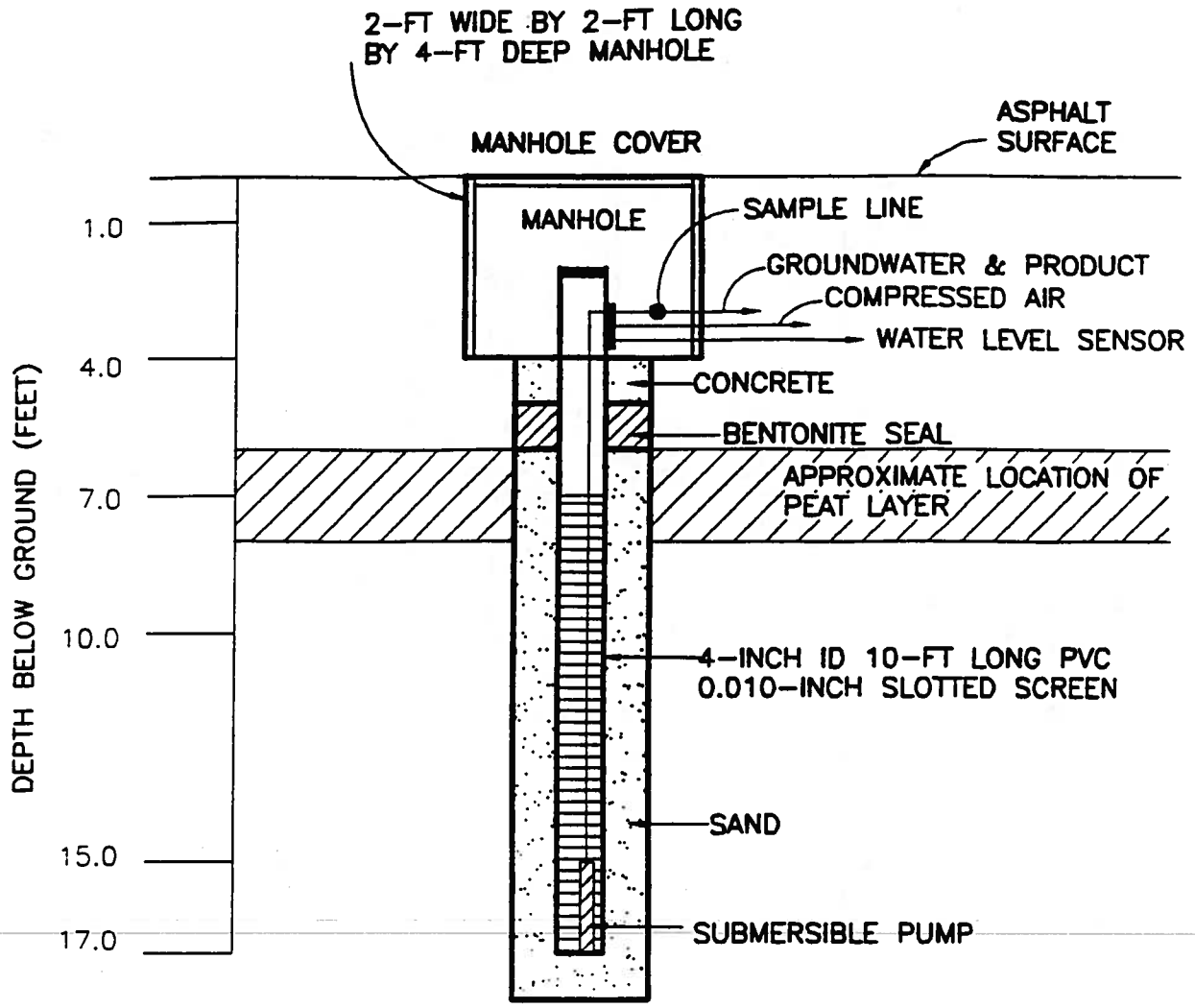

SCHEMATIC OF DEWATERING/ PRODUCT RECOVERY WELL

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
13-5001-04	KRH	11-21-95	9
SCALE: 1"=40'	CHECKED BY: JPS	SHEET 1 OF 1	

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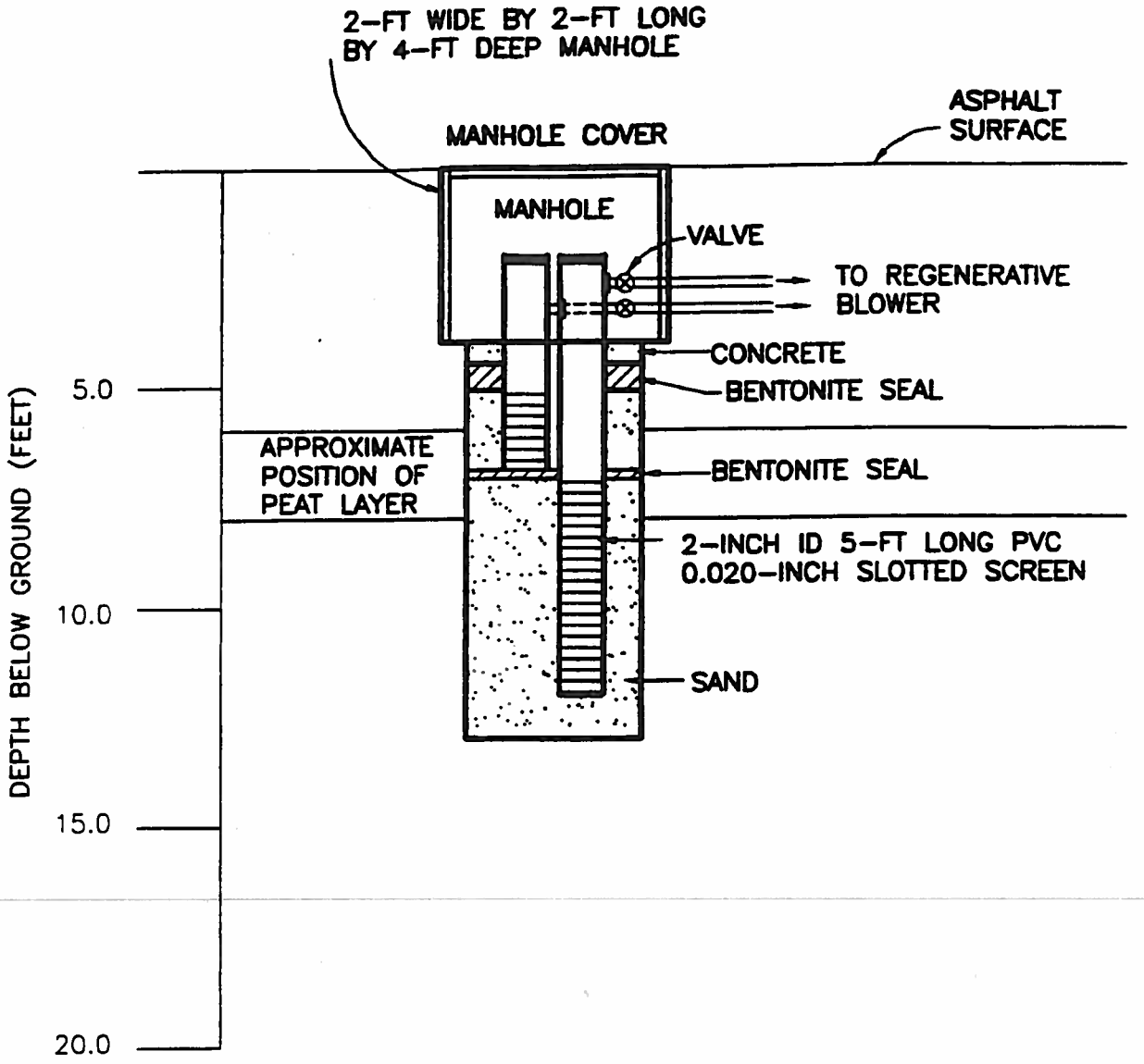

SCHEMATIC OF SOIL VAPOR EXTRACTION/ BIOVENTING WELL

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
13-5001-04	KRH	11-21-95	10
SCALE: 1"=40'	CHECKED BY: JPS	SHEET 1 OF 1	

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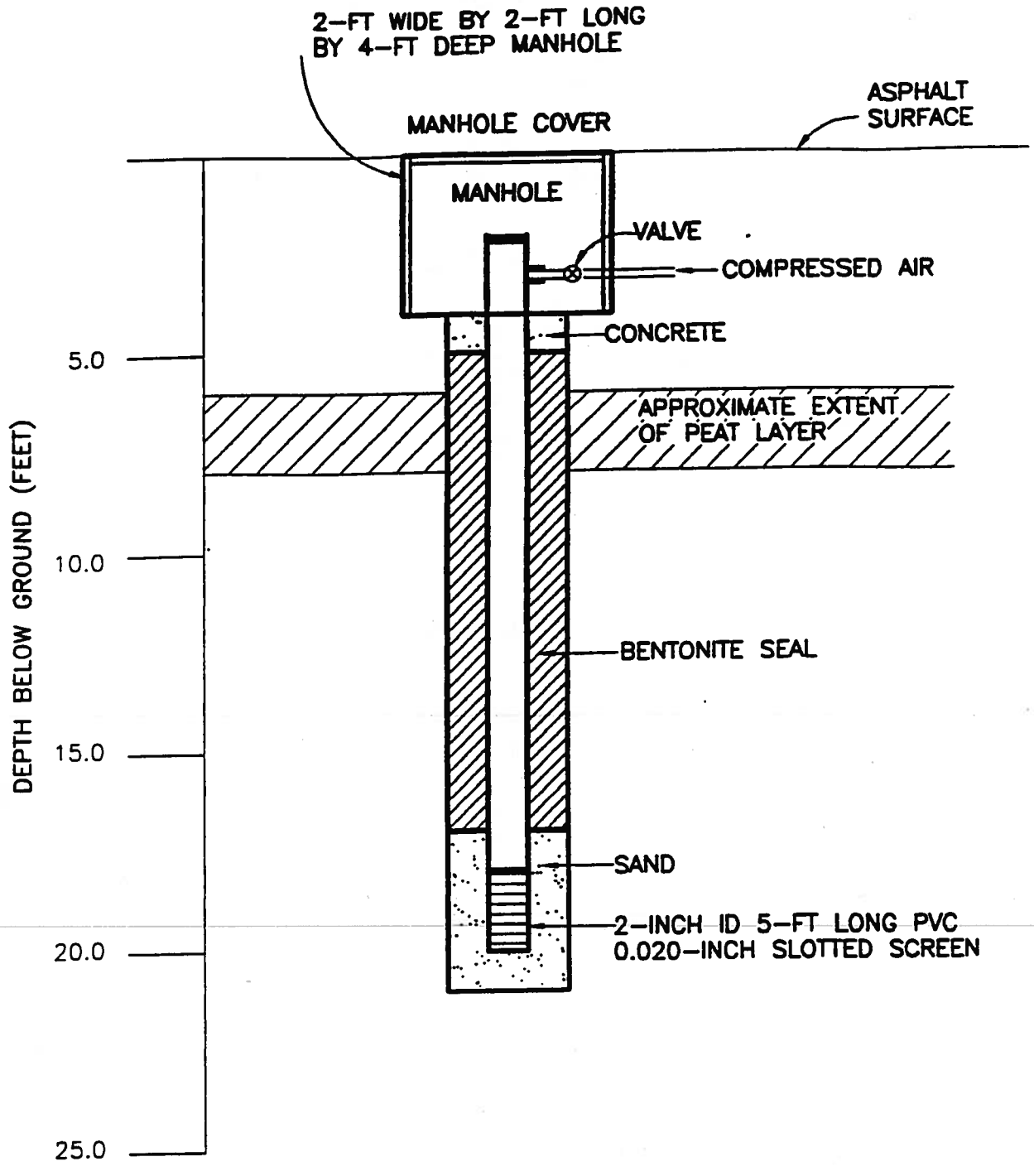

SCHEMATIC OF AIR SPARGING WELL

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
13-5001-04	KRH	11-21-95	11
SCALE: 1"=40'	CHECKED BY: JPS	SHEET 1 OF 1	

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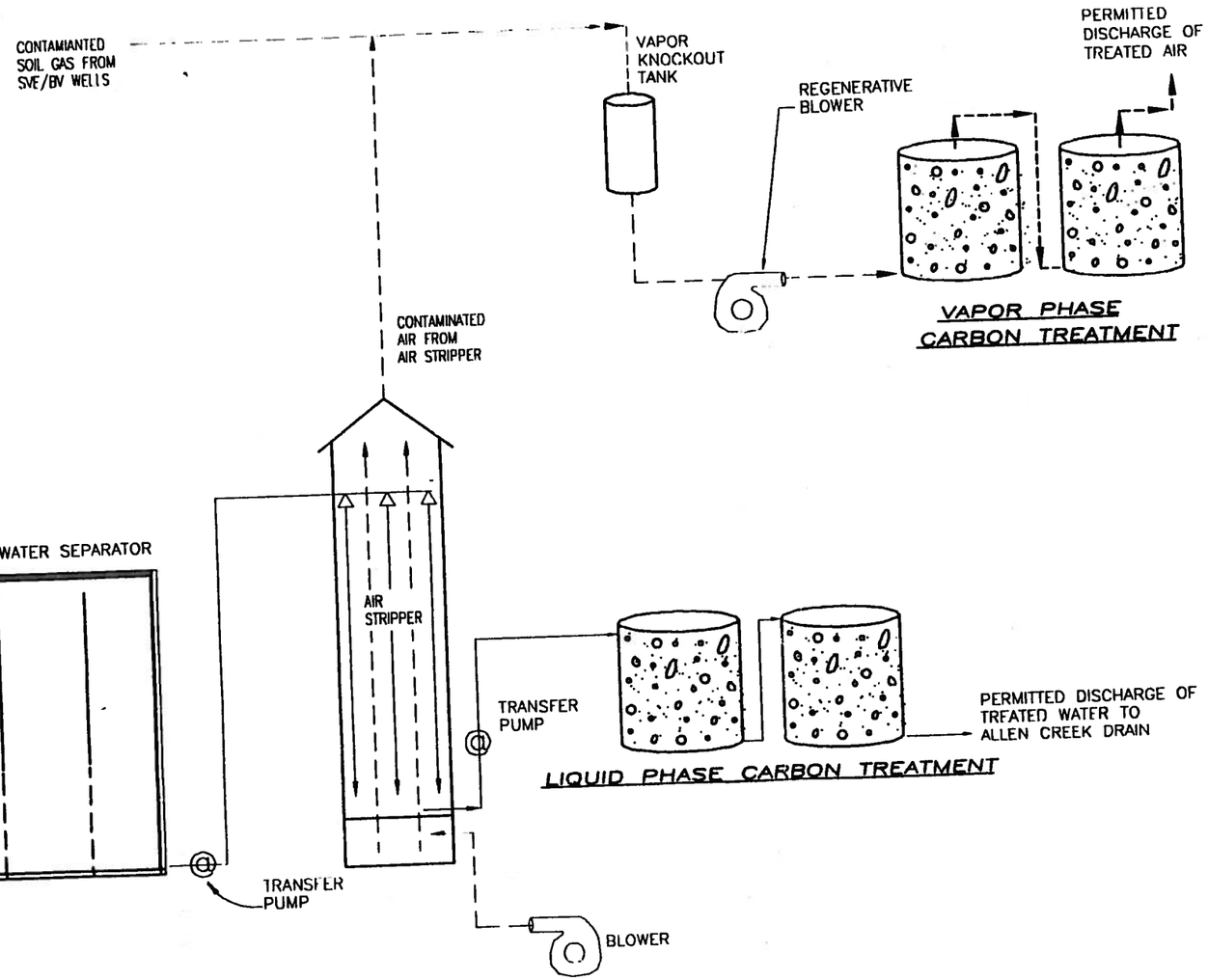

LEGEND:

LIQUID

VAPOR/AIR

CONCEPTUAL TREATMENT SYSTEM DESIGN

PARKS AND RECREATION GARAGE
415 W. WASHINGTON STREET
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
13-5001-04	KRH	06-12-95	12
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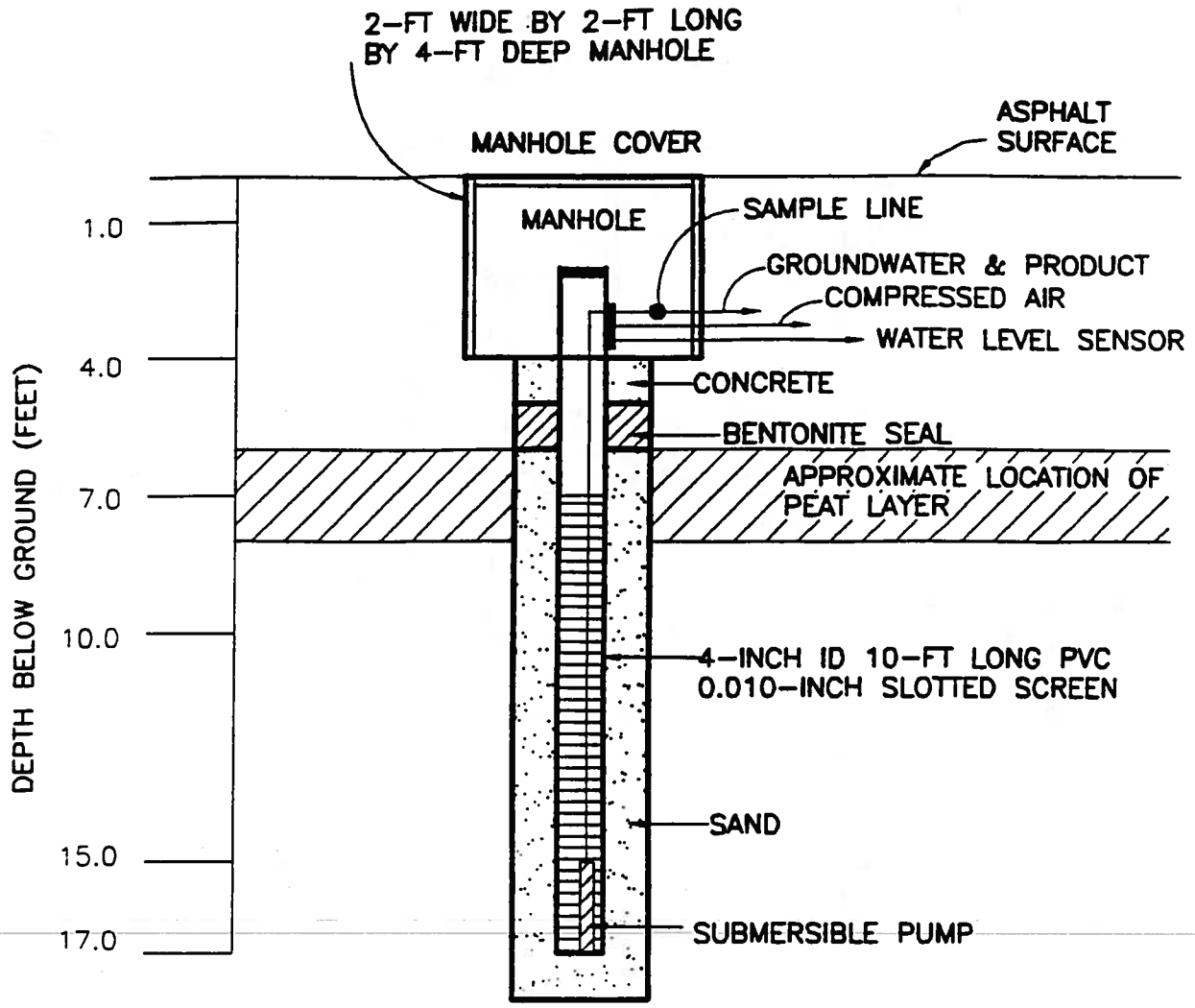

SCHEMATIC OF DEWATERING/ PRODUCT RECOVERY WELL

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
13-5001-04	KRH	11-21-95	9
SCALE: 1"=40'	CHECKED BY: JPS	SHEET 1 OF 1	

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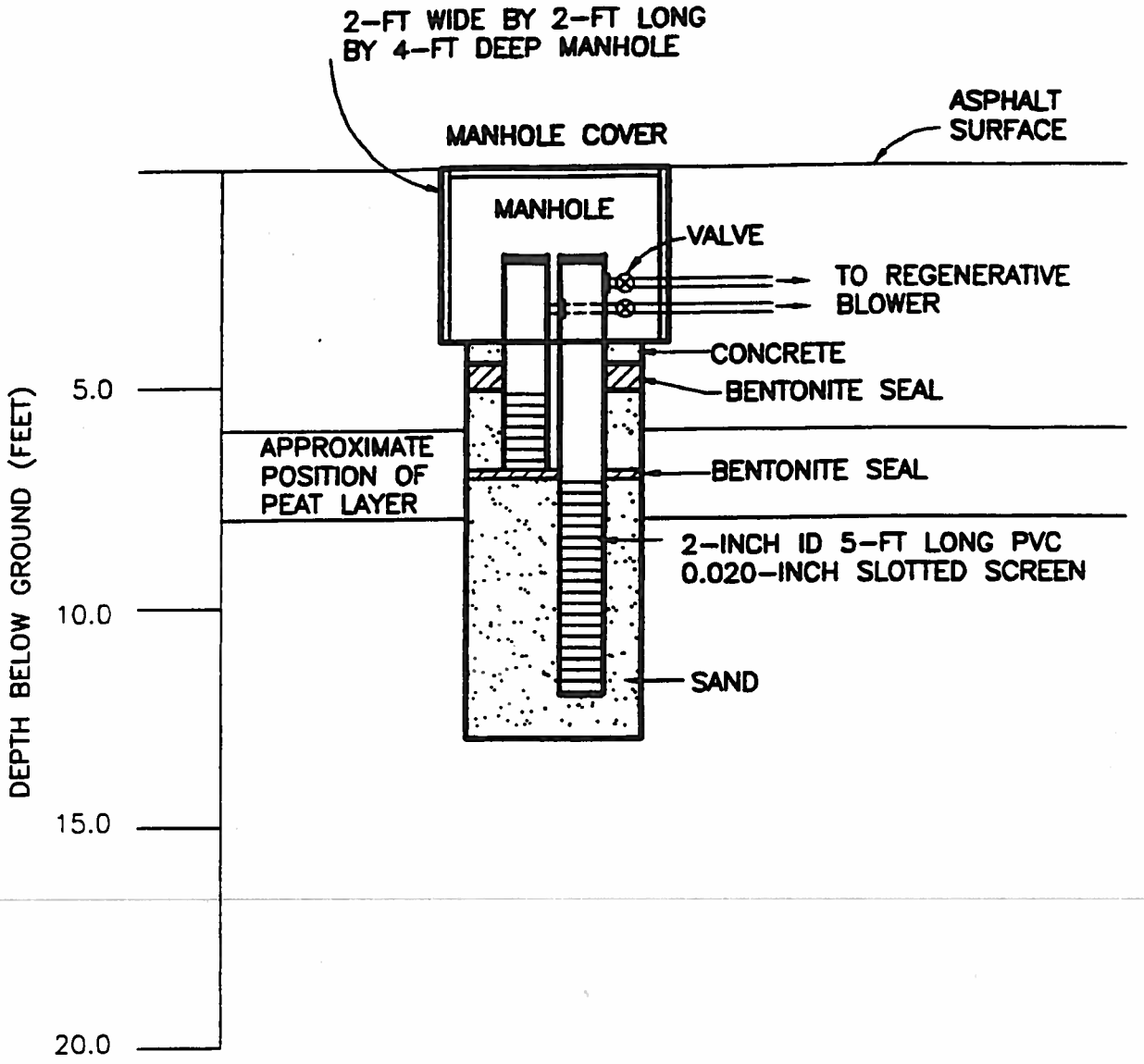

SCHEMATIC OF SOIL VAPOR EXTRACTION/ BIOVENTING WELL

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
13-5001-04	KRH	11-21-95	10
SCALE: 1"=40'	CHECKED BY: JPS	SHEET 1 OF 1	

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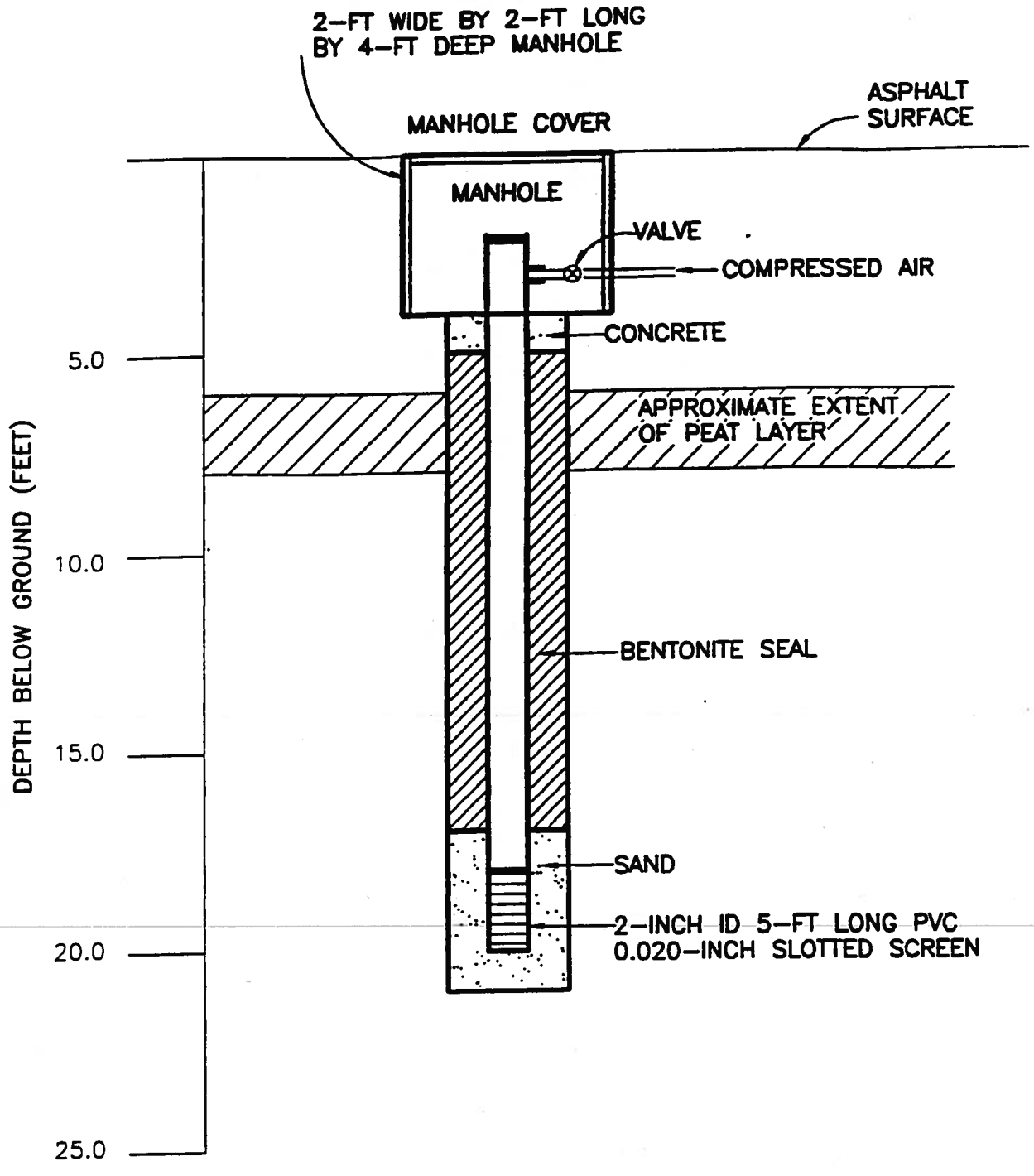


SCHEMATIC OF AIR SPARGING WELL

PARKS AND RECREATION BUILDING
415 WEST WASHINGTON ST.
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	PLATE NO:
13-5001-04	KRH	11-21-95	11
SCALE: 1"=40'	CHECKED BY: JPS	SHEET 1 OF 1	

C:\13\50010411 Wed Dec 06 10:11:52 1995 <3>

NTH Consultants, Ltd.

LOG OF TEST BORING NO:TB-1

Project Name : ANN ARBOR PARKS & RECREATION
NTH Proj. No: 13-5001 03

Project Location : ANN ARBOR, MICHIGAN
Checked By :

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 799.2 FT

ELEV. (FT)	DEPTH (FT)	
	0.4	PAVEMENT: ASPHALT
	1.1	CONCRETE
	2.5	FILL: BROWN SAND & GRAVEL
795		CONCRETE
	4.6	FILL: LOOSE BLACK SILTY SAND WITH TRACE OF GRAVEL & BRICK FRAGMENTS
	5.8	FILL: LOOSE BROWN SILTY FINE TO MEDIUM SAND WITH TRACE OF CLAY
	8.0	FILL: LOOSE BROWNISH-GRAY GRAVELLY SAND
790		FILL: LOOSE BROWN FIBEROUS PEAT
	10.0	VERY LOOSE BROWNISH-GRAY SILTY SAND WITH LITTLE GRAVEL
785		LOOSE TO VERY LOOSE BROWN SILTY FINE TO MEDIUM SAND
	16.0	
780		
	20	LOOSE BROWN SAND WITH TRACE OF SILT & TRACE OF GRAVEL
775		
	25	
	26.0	
770		LOOSE TO MEDIUM COMPACT BROWN SAND WITH TRACE OF SILT & OCCASIONAL GRAVELLY SAND SEAMS
	30.0	
	30	END OF BORING

SOIL SAMPLE DATA

SAMPLE TYPE NO.	BLOWS/ 6-INCHES	STD.PEN. RESISTANCE (N)	MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	HNu READING (PPM)
S-1	3 4 4	8	-	-	400
S-2	3 2 2	4	-	-	200
S-3	—	PUSHED	-	-	200
S-4	7 1 4	5	-	-	300
S-5	1 2 4	6	-	-	300
S-6	2 2 4	6	-	-	200
S-7	1 1 2	3	-	-	300
S-8	3 3 3	6	-	-	50
S-9	2 2 2	4	-	-	5
S-10	2 2 5	7	-	-	5
S-11	3 3 3	6	-	-	4
S-12	3 3 7	10	-	-	3
S-13	—	PUSHED	-	-	2
S-14	2 2 13	15	-	-	<1

Total Depth : 30.0 FT
Drilling Date : 04/06/95
Inspector : C. ANDREWS
Contractor : GEO-TEK, INC.
Driller : K. HOPE

Drilling Method :
CME-45 DRILL RIG WITH 8-1/4 INCH INSIDE-DIAMETER, HOLLOW-STEM AUGERS TO END OF BORING.

Plugging Procedure :
AIR SPARGE WELL NO. AS-1 INSTALLED IN BOREHOLE.

Water Level Observation :
GROUNDWATER ENCOUNTERED AT 8.0 FT BELOW GROUND SURFACE DURING DRILLING.

Figure No. 1

NTH Consultants, Ltd.

LOG OF TEST BORING NO:TB-2

Project Name : ANN ARBOR PARKS & RECREATION
NTH Proj. No: 13-5001 03

Project Location : ANN ARBOR, MICHIGAN
Checked By :

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 799.1 FT

ELEV (FT)	PRO-FILE		DEPTH (FT)
		0.4	
		PAVEMENT: CONCRETE 0.8	
		FILL: BROWN SILTY SAND & GRAVEL	
		CONCRETE	
795		FILL: BLACK SILTY SAND & GRAVEL WITH TRACE OF BROKEN CONCRETE & BRICK FRAGMENTS	5
		6.0	
		BLACK PEAT	
		8.0	
790		LOOSE GRAY SILTY SAND & GRAVEL	10
		11.5	
785			15
		LOOSE TO VERY LOOSE BROWN FINE TO MEDIUM SAND WITH LITTLE SILT	
780			20
		20.0	
		END OF BORING	
775			25
770			30

SOIL SAMPLE DATA

SAMPLE TYPE NO.	BLOWS/ 6-INCHES	STD PEN RESISTANCE (N)	MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	HNU READING (PPM)
S-1	4 3 2	5	-	-	20
S-2	3 4 2	6	-	-	160
S-3	2 1 1	2	-	-	50
S-4	4 3 3	6	-	-	4

Total Depth : 20.0 FT
Drilling Date : 04/07/95
Inspector : C. ANDREWS
Contractor : GEO-TEK, INC.
Driller : K. HOPE

Drilling Method :
CME-45 DRILL RIG WITH 4-1/4 & 8-1/4 INCH INSIDE-DIAMETER, HOLLOW-STEM AUGERS TO END OF BORING.

Plugging Procedure :
PIEZOMETER WELL NO. P-1 INSTALLED IN BOREHOLE.

Water Level Observation :
GROUNDWATER ENCOUNTERED AT 8.0 FT BELOW GROUND SURFACE DURING DRILLING; AT 8.0 FT UPON COMPLETION.

Figure No. 2

NTH Consultants, Ltd.

LOG OF TEST BORING NO:TB-3

Project Name : ANN ARBOR PARKS & RECREATION
NTH Proj. No: 13-5001 03

Project Location : ANN ARBOR, MICHIGAN
Checked By :

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 799.2 FT

ELEV. (FT)	PRO-FILE		DEPTH (FT)
		FILL: DARK BROWN SILTY SAND & GRAVEL	0.8
		CONCRETE	1.1
		FILL: LOOSE BLACK SILTY SAND WITH TRACE OF GRAVEL	2.5
795		FILL: LOOSE GRAY SILTY FINE TO MEDIUM SAND WITH TRACE OF GRAVEL	6.0
		BLACK PEAT	7.5
		VERY LOOSE DARK BKROWN GRAVELLY SAND	8.5
790		VERY LOOSE DARK BROWN SILTY FINE TO MEDIUM SAND	
		END OF BORING	11.5
785			
780			
775			
770			

SOIL SAMPLE DATA

DEPTH (FT)	SAMPLE TYPE NO.	BLOWS/ 6-INCHES	STD.PEN. RESISTANCE (N)	MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	HNu READING (PPM)
5	S-1	3 4 6	10	-	-	60
10	S-2	2 1 2	3	-	-	120
15						
20						
25						
30						

Total Depth : 11.5 FT
Drilling Date : 04/10/95
Inspector : C. ANDREWS
Contractor : GEO-TEK, INC.
Driller : K. HOPE

Drilling Method :
CME-45 DRILL RIG WITH 4-1/4 INCH INSIDE-DIAMETER, HOLLOW-STEM AUGERS TO END OF BORING.

Plugging Procedure :
BIOVENTING WELL NO. BV-1 INSTALLED IN BOREHOLE.

Water Level Observation :
GROUNDWATER ENCOUNTERED AT 8.0 FT BELOW GROUND SURFACE DURING DRILLING.

Figure No. 3

NTH Consultants, Ltd.

LOG OF TEST BORING NO:TB-4

Project Name : ANN ARBOR PARKS & RECREATION
NTH Proj. No: 13-5001 03

Project Location : ANN ARBOR, MICHIGAN
Checked By :

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 799.1 FT

ELEV. (FT)	DEPTH (FT)	Description
		FILL: DARK BROWN SILTY SAND & GRAVEL
	2.5	
	3.0	FILL: BLACK SILTY SAND WITH TRACE OF GRAVEL
795		
	5	FILL: LOOSE BROWN SILTY FINE TO MEDIUM SAND WITH TRACE OF CLAY
	6.0	BLACK PEAT
	7.5	LOOSE BROWN SILTY SAND
	8.5	LOOSE BLACK GRAVELLY SAND
790	9.0	
	10	LOOSE BLACKISH-GRAY SILTY FINE TO MEDIUM SAND
	11.5	
		LOOSE BROWN SILTY FINE SAND
785	15	
	16.5	LOOSE BROWN SAND WITH TRACE OF SILT
780	20	
	20.0	END OF BORING
775	25	
770	30	

SOIL SAMPLE DATA

SAMPLE TYPE NO.	BLOWS/ 6-INCHES	STD.PEN. RESISTANCE (N)	MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	HNu READING (PPM)
S-1	4 4 3	7	-	-	200
S-2	5 5 4	9	-	-	200
S-3	3 3 3	6	-	-	<1
S-4	1 3 4	7	-	-	<1

Total Depth : 20.0 FT
Drilling Date : 04/10/95
Inspector : C. ANDREWS
Contractor : GEO-TEK, INC.
Driller : K. HOPE

Drilling Method :
CME-45 DRILL RIG WITH 6-1/4 INCH INSIDE-DIAMETER, HOLLOW-STEM AUGERS TO END OF BORING.

Plugging Procedure :
SOIL VAPOR EXTRACTION WELL NO. SVE-1 INSTALLED IN BOREHOLE.

Water Level Observation :
GROUNDWATER ENCOUNTERED AT 8.0 FT BELOW GROUND SURFACE DURING DRILLING.

Figure No. 4

NTH Consultants, Ltd.

LOG OF TEST BORING NO:TB-5

Project Name : ANN ARBOR PARKS & RECREATION
NTH Proj. No: 13-5001 03

Project Location : ANN ARBOR, MICHIGAN
Checked By :

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 799.3 FT

ELEV. (FT)	PRO-FILE		DEPTH (FT)
		FILL: DARK BROWN TO BROWN SILTY SAND & GRAVEL WITH LITTLE BROKEN CONCRETE & LUMBER	
			2.5
		CONCRETE	3.0
795		FILL: LOOSE DARK BROWN TO BLACK SILTY SAND & GRAVEL WITH TRACE OF CLAY	5
			6.0
		BLACK PEAT	7.5
790		LOOSE BLACK SILTY FINE TO MEDIUM SAND	10
			11.5
785			15
		LOOSE TO VERY LOOSE BROWN SAND WITH TRACE OF SILT	
780			20
			20.0
		END OF BORING	
775			25
770			30

SOIL SAMPLE DATA

SAMPLE TYPE NO.	BLOWS/ 6-INCHES	STD.PEN. RESISTANCE (N)	MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	HNu READING (PPM)
S-1	3 4 4	8	-	-	50
S-2	2 3 3	6	-	-	300
S-3	1/12" 1/12"	<2	-	-	80
S-4	2 2 2	4	-	-	3

Total Depth : 20.0 FT
Drilling Date : 04/11/95
Inspector : C. ANDREWS
Contractor : GEO-TEK, INC.
Driller : K. HOPE

Drilling Method :
CME-45 DRILL RIG WITH 6-1/4 INCH INSIDE-DIAMETER, HOLLOW-STEM AUGERS TO END OF BORING.

Plugging Procedure :
PIEZOMETER WELL NO. P-2 INSTALLED IN BOREHOLE.

Water Level Observation :
GROUNDWATER ENCOUNTERED AT 8.0 FT BELOW GROUND SURFACE DURING DRILLING.

Figure No. 5

NTH Consultants, Ltd.

LOG OF TEST BORING NO:TB-6

Project Name : ANN ARBOR PARKS & RECREATION — NTH Proj. No: 13-5001 03

Project Location : ANN ARBOR, MICHIGAN — Checked By :

SUBSURFACE PROFILE

GROUND SURFACE ELEVATION: 799.0 FT

ELEV. (FT)	DEPTH (FT)	Description
	0	FILL: DARK BROWN SILTY SAND & GRAVEL
	1.0	
795	5	FILL: BROWN SILTY SAND WITH TRACE OF GRAVEL
	7.5	
790	10	FILL: PEASTONE
	11.5	
785	15	BROWN SILTY FINE TO MEDIUM SAND
780	20	
	20.0	END OF BORING
775	25	
770	30	

SOIL SAMPLE DATA

SAMPLE TYPE NO.	BLOWS/ 6-INCHES	STD.PEN. RESISTANCE (N)	MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	HNu READING (PPM)

NO SAMPLES OBTAINED FROM THIS TEST BORING DURING DRILLING OPERATIONS.

Total Depth : 20.0 FT
Drilling Date : 04/12/95
Inspector : C. ANDREWS
Contractor : GEO-TEK, INC.
Driller : K. HOPE

Drilling Method :
CME-45 DRILL RIG WITH 6-1/4 INCH INSIDE-DIAMETER, HOLLOW-STEM AUGERS TO END OF BORING.

Plugging Procedure :
PIEZOMETER WELL NO. P-3 INSTALLED IN BOREHOLE.

Water Level Observation :
GROUNDWATER ENCOUNTERED AT 7.5 FT BELOW GROUND SURFACE DURING DRILLING.

Figure No. 6

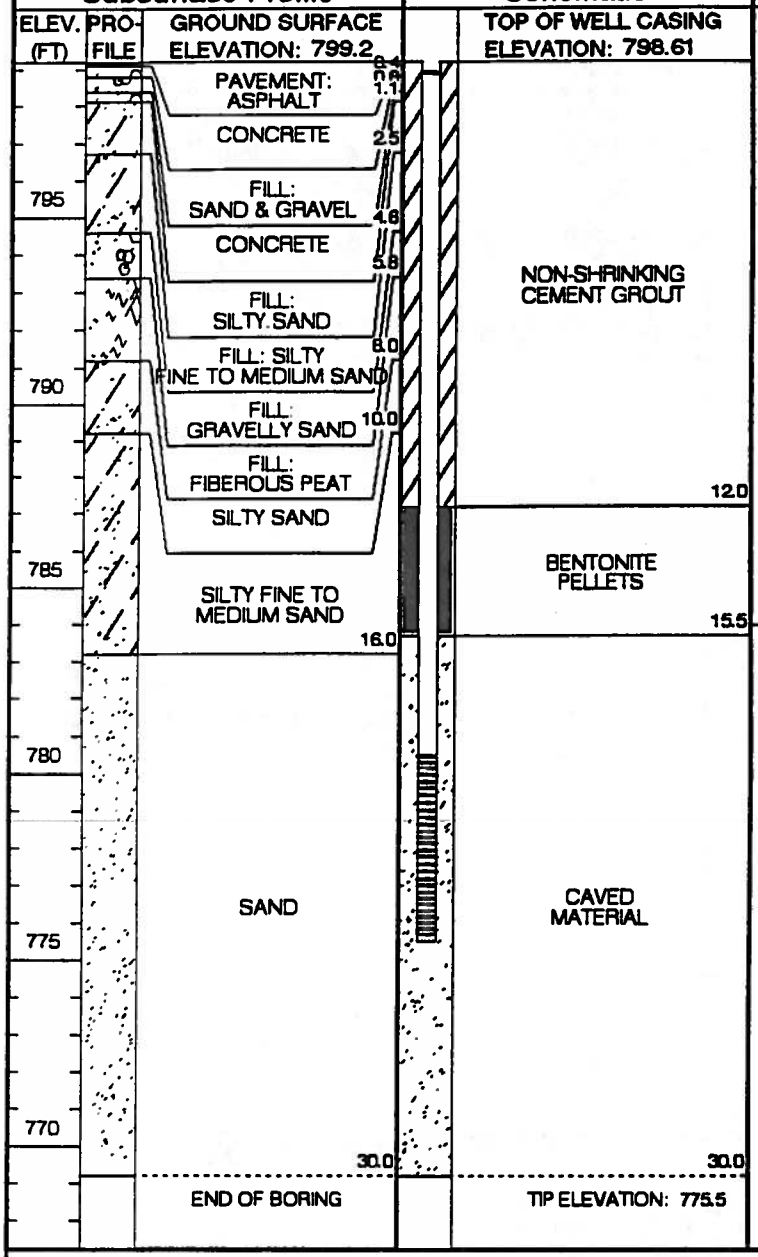
NTH Consultants, Ltd.

MONITORING WELL NO. AS-1

Project Name : ANN ARBOR PARKS & RECREATION — NTH Proj. No: 13-5001 03

Project Location : ANN ARBOR, MICHIGAN — Checked By :

LOG OF MONITORING WELL



GROUNDWATER DATA

Date	Ground-water Elev.(ft)	Comments

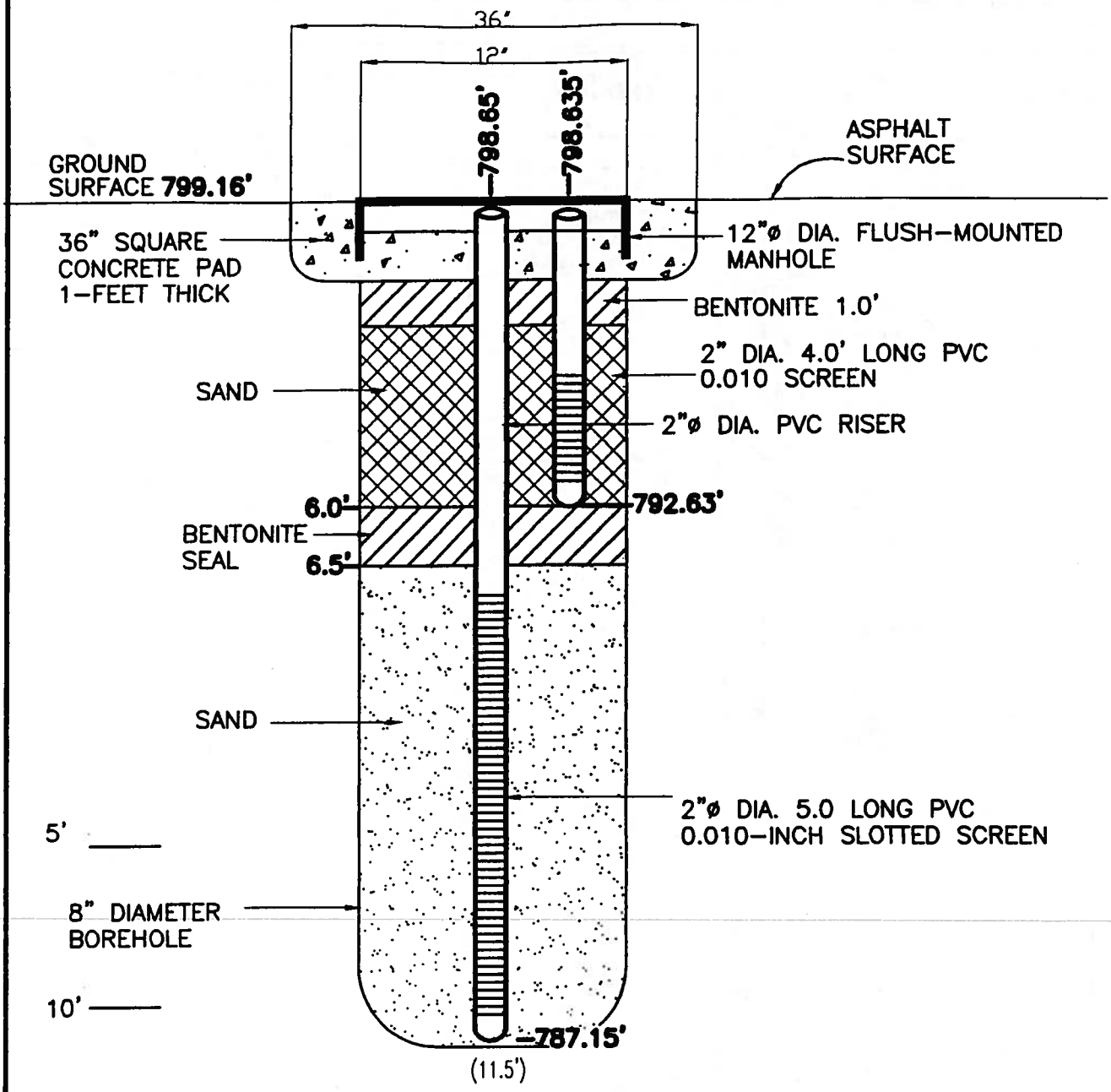
NOTES :

[1] FOR DETAILS OF SUBSURFACE STRATA, SEE LOG OF TEST BORING NO. TB-1.

Started:	04/06/95
Completed:	04/06/95
Inspector:	C. ANDREWS
Driller:	K. HOPE
Contractor:	GEO-TEK, INC.
Equipment:	CME-45 DRILL RIG
Well Type:	AIR SPARGE

Casing Diameter:	4.0"
Casing Length:	18.2'
Casing Type:	PVC
Screen Diameter:	4.0"
Screen Length:	5.0'
Screen Mesh:	0.010"
Screen Type:	PVC

Figure No. 7



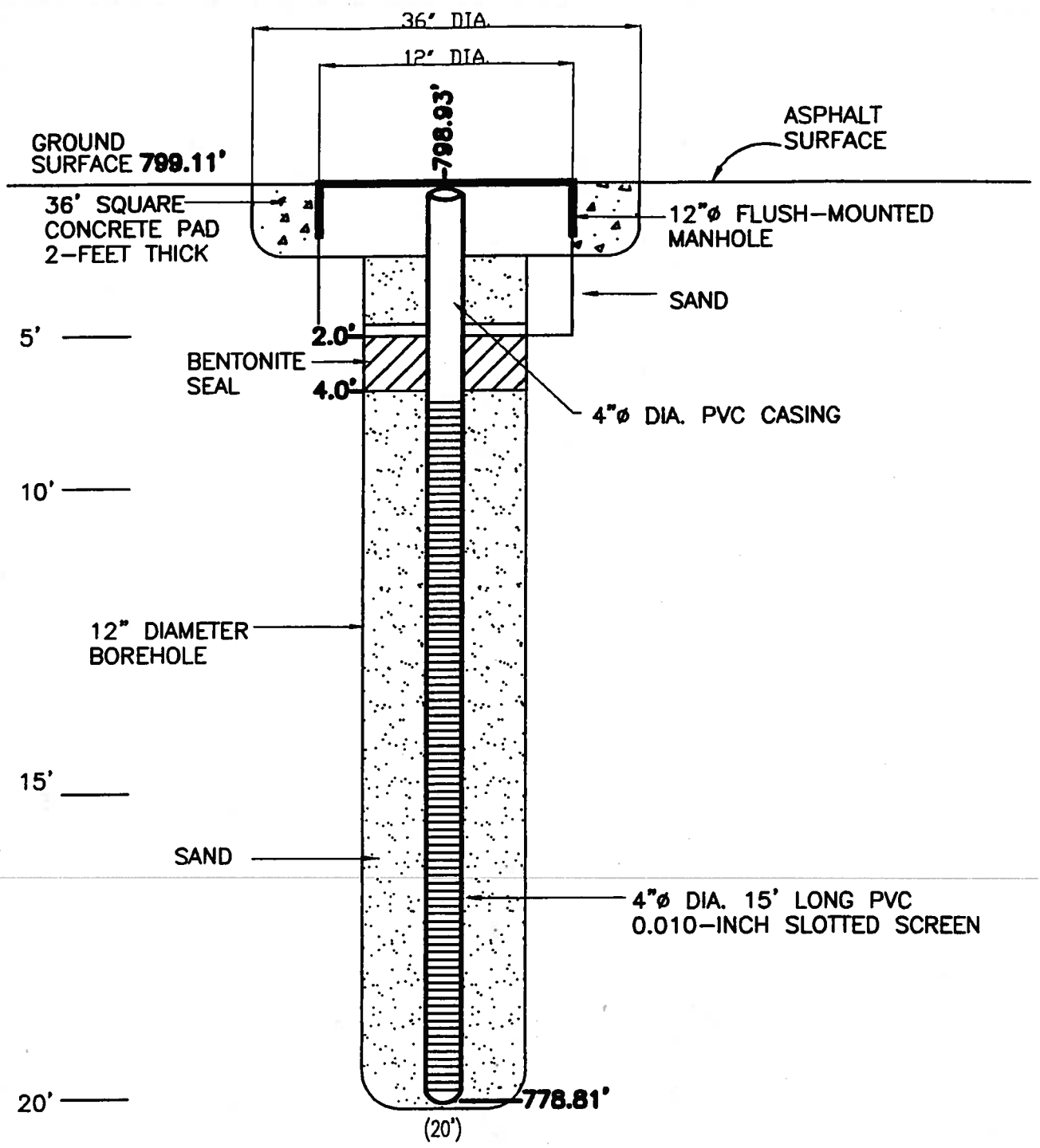
BV-1 WELL CONSTRUCTION DETAIL

INSTALLED 4/10/95
415 W. WASHINGTON
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	FIGURE NO:
13-5001-03	KRH	03-22-96	8
SCALE: AS SHOWN	CHECKED BY: HRH	SHEET 1 OF 1	

C:\13\500103AA Mon Mar 25 11:28:59 1996 <3>



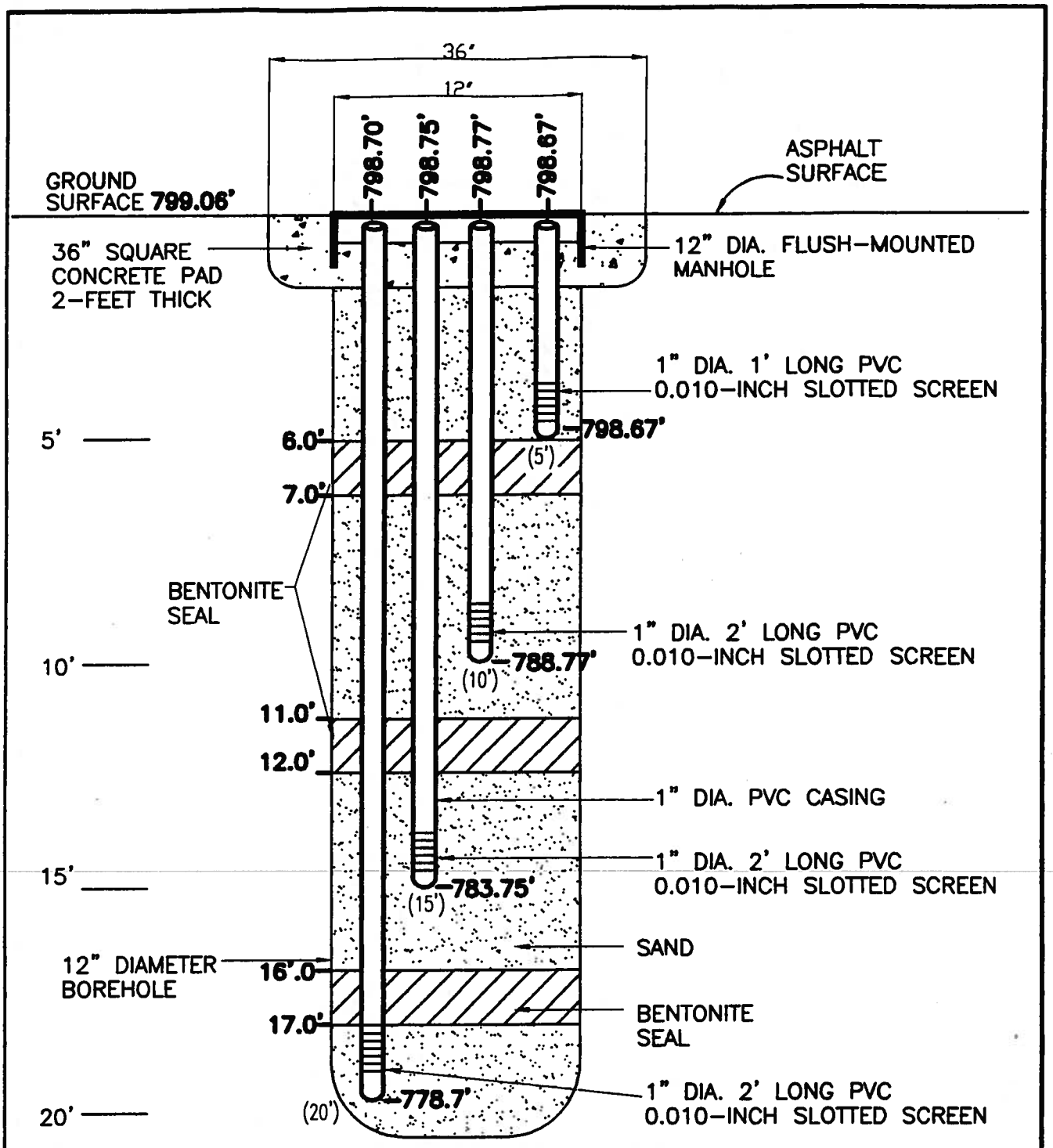
SVE-1 WELL CONSTRUCTION DETAIL

INSTALLED 4/10/95
415 W. WASHINGTON
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	FIGURE NO:
13-5001-03	KRH	11-01-95	9
SCALE: AS SHOWN	CHECKED BY: CA	SHEET 1 OF 1	

C:\13\50010340 Mon Nov 06 09:01:48 1995 <1>



P-1 PIEZOMETER NEST CONSTRUCTION

INSTALLED 4/7/95
415 W. WASHINGTON
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	FIGURE NO.
13-5001-03	KRH	11-01-95	10
SCALE: AS SHOWN	CHECKED BY: CA	SHEET 1 OF 1	

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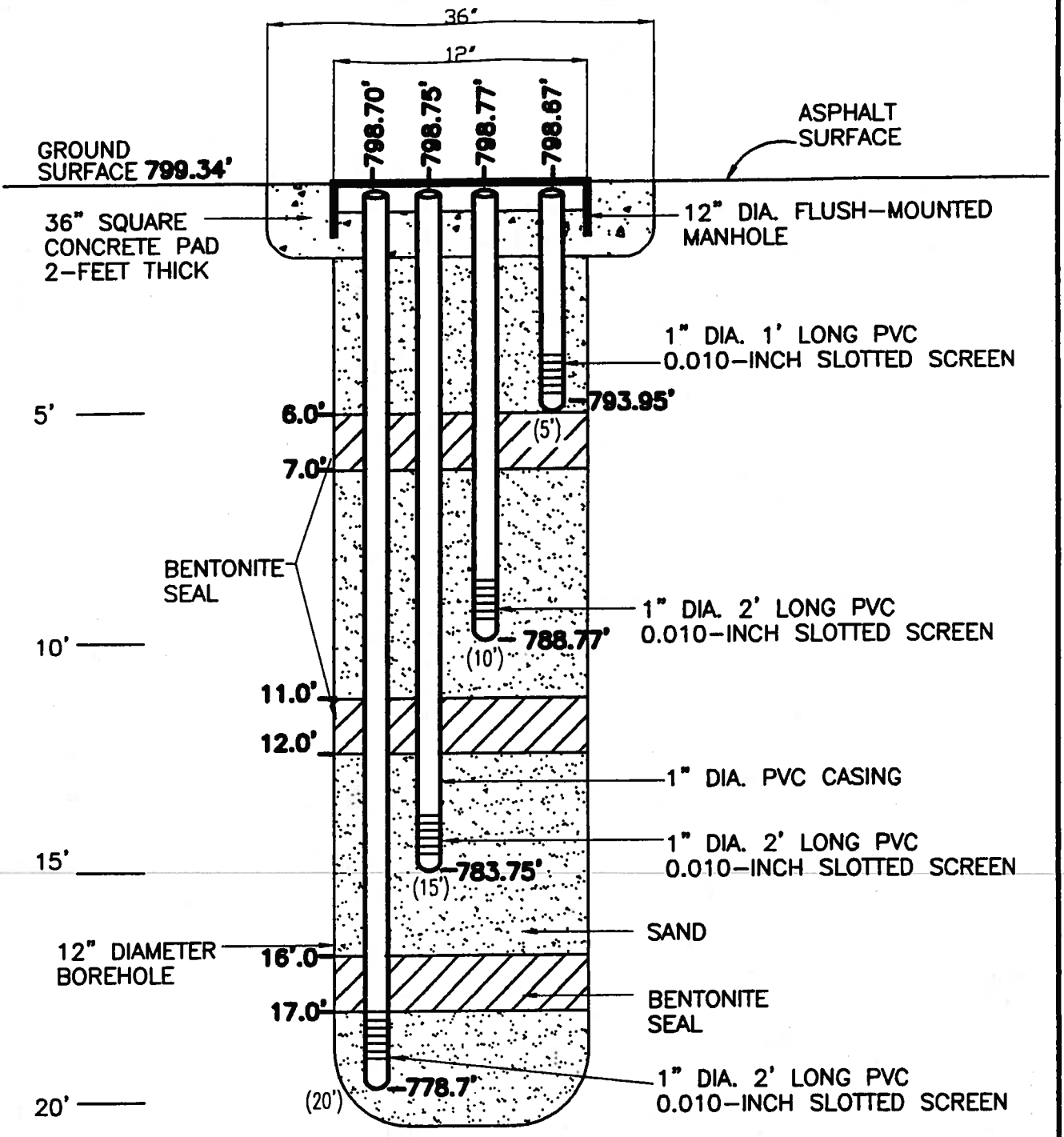


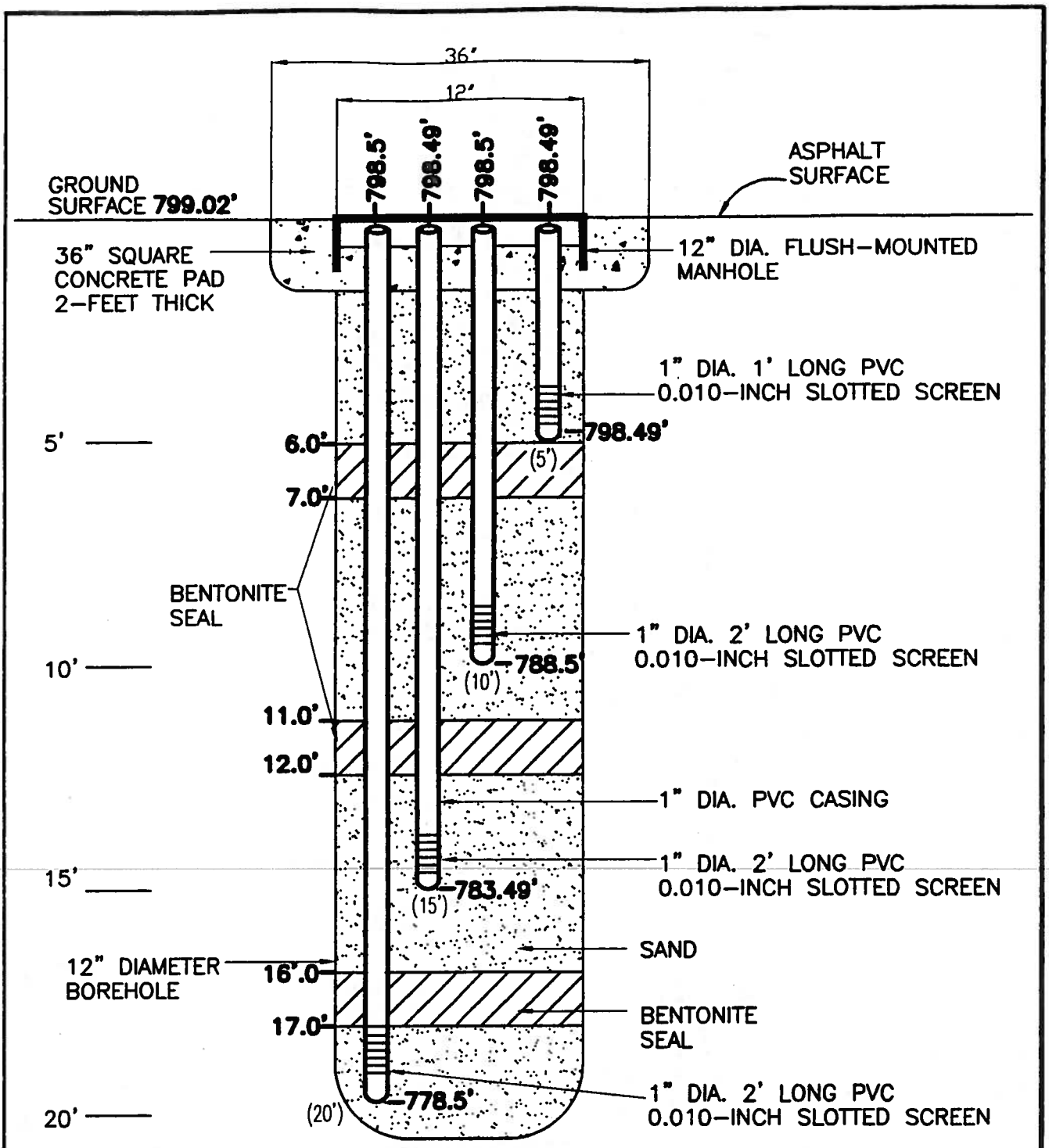
P-2 PIEZOMETER NEST CONSTRUCTION

INSTALLED 4/11/95
415 W. WASHINGTON
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	FIGURE NO.
13-5001-03	KRH	11-01-95	11
SCALE: AS SHOWN	CHECKED BY: CA	SHEET 1 OF 1	

C:\13\50010310 Mon Nov 06 09:03:10 1995 <1>



P-3 PIEZOMETER NEST CONSTRUCTION

INSTALLED 4/12/95
415 W. WASHINGTON
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	FIGURE NO.
13-5001-03	KRH	11-01-95	12
SCALE: AS SHOWN	CHECKED BY: CA	SHEET 1 OF 1	

C:\13\500103AB Mon Nov 06 09:27:09 1995 <1>

APPENDIX B

Laboratory Data Reports for Analytical Testing

TABLE 1
SUMMARY OF SOIL CHEMICAL ANALYSES: NTH SAMPLING EVENT

ANN ARBOR PARKS & RECREATION GARAGE
NTH PROJECT NO. 13-5001-04

SAMPLE DESIGNATION	SAMPLE DEPTH (FT)	PARAMETER											
		DETECTED POLYNUCLEAR AROMATICS (µG/KG)					BTEX (µG/KG)				MTBE (µG/KG)	TOTAL LEAD (MG/KG)
		Benzo (a) Pyrene	Chrysene	Fluoranthene	Naphthalene	Pyrene	Benzene	Toluene	Ethyl Benzene	Xylenes		
TB-1 : S-2	6.0	ND	ND	ND	ND	ND	290	530	1,300	7,000	<100	72
TB-1 : S-4	10.0	ND	ND	ND	810	ND	1,100	14,000	15,000	38,000	<50,000	10
TB-1 : S-7	16.0	ND	ND	ND	ND	ND	16	250	300	430	<100	2.5
TB-2 : S-1	5.0	ND	ND	ND	ND	ND	<10	76	210	170	<100	8.8
TB-2 : S-2	10.0	ND	ND	ND	2,000	ND	4,700	11,000	31,000	56,000	<50,000	11
TB-2 : S-3	15.0	ND	ND	ND	ND	ND	14	16	100	100	<100	2.2
TB-2 : S-4	20.0	ND	ND	ND	ND	ND	<50	240	660	400	<5,000	4.6
TB-3 : S-1	5.0	ND	ND	ND	ND	ND	360	6,900	24,000	190,000	<5,000	5.6
TB-3 : S-2	10.0	ND	ND	ND	870	ND	230	4,900	5,100	25,000	<5,000	7.6
TB-4 : S-1	5.0	ND	ND	ND	ND	ND	200	7,500	5,000	39,000	<100	4.3
TB-4 : S-2	10.0	ND	ND	ND	ND	ND	760	23,000	21,000	87,000	<25,000	2.8
TB-5 : S-1	5.0	1,800	1,200	1,600	2,200	1,100	<50	<50	1,000	5,700	<5,000	99
TB-5 : S-2	10.0	ND	ND	ND	ND	ND	<50	10,000	42,000	72,000	<5,000	4.2
TB-5 : S-3	15.0	ND	ND	ND	ND	ND	<10	16	250	150	<100	2.7
LABORATORY-REPORTED METHOD DETECTION LIMIT		330	330	330	330	330	10	10	10	30	100	1.0
STATE-WIDE DEFAULT BACKGROUND		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	21.0
P.A. 451 TIER 1 RESIDENTIAL RISK-BASED SCREENING LEVELS	Cs	1,400	1,400,000	51,000,000	15,000,000	32,000,000	88,000	24,000,000	11,000,000	200,000,000	3,600,000	400
	LEACHING TO GROUNDWATER	3,700	1,400,000	68,000	5,500	56,000	100	16,000	4,700	74,000	4,800	0.08 (A)

NOTES:

[1] Samples collected by NTH Consultants personnel in April 1995 and analyzed by NET Laboratories of Auburn Hills, MI.
[2] µG/KG - Micrograms per kilogram (= parts per billion); MG/KG - Milligrams per kilogram (= parts per million).
[3] ND - Not detected at or above laboratory-reported method detection limit for indicated parameter.
[4] (A) - Background, as defined in Rule 701(c), may be substituted as the cleanup criteria if higher than the ceanup criterion.
[5] Cs - Concentration, if not exceeded, is considered safe for human exposure via direct (oral and dermal) contact.
[6] "LEACHING TO GROUNDWATER" - Concentration in soil, if not exceeded, does not require leachate analysis to demonstrate compliance with groundwater criteria.

TABLE 2
SUMMARY OF GROUNDWATER CHEMICAL ANALYSES: NTH SAMPLING EVENT

ANN ARBOR PARKS & RECREATION GARAGE
NTH PROJECT NO. 13-5001-04

SAMPLE DESIGNATION		PARAMETER								
		POLYNUCLEAR AROMATICS (µg/L)		BTEX (µg/L)				MTBE (µg/L)	LEAD (mg/L)	
		NAPHTHALENE	ALL OTHERS	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES		DISSOLVED	TOTAL
P-1		370	ND	14,000	29,000	2,900	15,000	<50,000	ND	-----
P-2		ND	ND	5,900	15,000	1,300	6,800	<12,000	ND	-----
P-3		16	ND	96	99	110	190	<50	ND	-----
MW-3		ND	ND	ND	<1	1.3	ND	<50	ND	-----
MW-6		74	ND	63	12	84	360	<500	ND	-----
MW-8		ND	ND	ND	<1	ND	ND	<50	ND	-----
MW-11		ND	ND	320	<10	11	130	<500	ND	-----
WS-1		ND	ND	400	2,800	230	880	<250	ND	ND
WS-2		ND	ND	220	1,600	140	900	<1,000	ND	ND
WS-3		ND	ND	69	450	52	180	<50	ND	0.003
LABORATORY-REPORTED METHOD DETECTION LIMIT		5	5	1	1	1	3	50	0.003	
P.A. 451 TIER 1 RESIDENTIAL RISK-BASED SCREENING LEVELS	CGW	260	VARIOUS	5	790*	74*	280*	240	0.004 (A)	
	GSI	29	VARIOUS	53	110	31	59	380	0.0066 (A)	

NOTES:

[1] Samples collected by NTH Consultants personnel in September 1995 and analyzed by NET Laboratories of Auburn Hills, MI.
[2] µg/L - Micrograms per liter (= parts per billion); mg/L - Milligrams per liter (= parts per million).
[3] ND - Not detected at or above laboratory-reported method detection limit for indicated parameter.
[4] --- - Not tested for indicated parameter.
[5] (A) - Background, as defined in Rule 701(c), may be substituted as the cleanup criteria if higher than the cleanup criterion.
[6] * - Aesthetic-based criteria--Use of the most restricitve criteria is required, therefore health-based criteria is not presented.
[7] Cgw - Concentration in groundwater, if not exceeded, is considered safe for exposure.
[8] GSI - Presented only to establish groundwater criteria which are protective of surface water.

APPENDIX F

Feasibility Analysis

Feasibility Analysis

The PA213 RBCA guidelines indicate that the feasibility of a Tier Two closure must be considered in evaluating remedial alternatives. To satisfy this requirement, NTH evaluated the potential exposure routes to points of compliance located at the property boundary and adjacent to the Parks and Recreation Garage. We then performed a groundwater transport model to estimate potential maximum concentrations of benzene at points of compliance and points of exposure. Benzene was selected because it has the lowest cleanup criteria of the parameters of concern at the site.

Evaluation of Data

Review of various reports, laboratory data, and additional information for this site indicates that the primary concern with the presence of residual petroleum compounds focuses on potential exposure routes involving groundwater, since direct contact with soil is prevented by existing pavement and the depth of contamination. The principal exposure pathways appear limited to inhalation of volatilized VOCs, and to lesser degree, ingestion of contaminated groundwater. Groundwater samples with VOCs (primarily benzene) concentrations exceeding drinking water criteria have been collected from the remediation area. In addition, several groundwater samples have been encountered with contaminant concentrations exceeding groundwater-surface water interface criteria and groundwater volatilization criteria.

Although the City requires buildings to use the municipal water supply, the City does not specifically prohibit installation of groundwater wells for private use. Consequently, private use of impacted groundwater provides a potential human exposure pathway, including oral ingestion, skin contact, and consumption of food products irrigated with impacted groundwater. However, Part 213 allows for control of these routes of exposure through implementation of institutional controls which prohibit use of impacted groundwater.

The petroleum compounds of concern in site groundwater are principally limited to BTEX and naphthalene, with benzene serving as the indicator compound. These compounds, particularly BTEX are volatile, and as such, represent sources of receptor exposure via inhalation of volatilization to outdoor air and vapor intrusion into buildings. The concentrations of VOCs and naphthalene detected in soil at the site do not exceed draft Part 213 Tier I criteria, nor do the concentrations detected exceed ASTM Example Tier I criteria for groundwater volatilization to outdoor air. However, some compounds, particularly benzene, have been detected in one or more groundwater samples with levels exceeding ASTM criteria for groundwater vapor intrusion into buildings.

In summary, the following exposure routes which require further evaluation have been identified for the site:

- Groundwater Contamination: Ingestion
- Groundwater Contamination: Vapor intrusion into buildings If institutional controls are applied to groundwater at the site (an ordinance prohibiting private use of groundwater in the area), then the concern which remains at the site is limited to potential volatilization of benzene into existing buildings, specifically commercial buildings, on and offsite.

Modeling Method and Results

To estimate the concentration of benzene at the potential exposure points, we utilized a three dimensional closed form model developed by Baetsle. For any point defined by 3-dimensional coordinates, the model estimates the concentration of benzene at any specified time. The model input data include the mass of contaminants, dispersion coefficients (the rate at which contaminants are mixed with clean water at the edge of the plume), soil retardation factor (the rate at which the contaminant adheres to soil), contaminants' decay factor (the rate at with biodegradation takes place), groundwater velocity, time, and coordinates of the point of exposures relative to the location of the release.

The results of the analyses show that using reasonable assumptions for decay, retardation, and dispersivity, it can be estimated that off-site locations will not exceed the Tier I criteria in the future. However, a sensitivity analysis showed that the model results are significantly dependent on the selection of input parameters, particularly decay. The potential range for decay values for benzene in the existing literature base is more than one order of magnitude. For this reason, the results of such modeling can be only used as a guide in selecting the most appropriate remedial option.

We recommend the collection of additional groundwater quality data to compare to the 1992/3 and 1995 data base to assist in evaluating the decay rate at the site, relative to the rate of groundwater migration. A description of the recommended data collection plan is presented below.

Remediation Alternatives

As a result of the preliminary Tier II modeling, we have developed several approaches to remediation of the Parks and Recreation Garage site:

Alternative 1 - The first alternative is to proceed with the remediation plan detailed in the Draft Corrective Action Plan presently being reviewed by the City. This alternative will achieve the cleanup criteria in the shortest time (approximately 2-3 years).

Alternative 2 - The second alternative is to rely on the intrinsic bioremediation that appears to be taking place at the site, and to install a system of contaminant containment. This alternative would consist of the following: one groundwater pumping well to prevent the plume from migrating; a soil-vapor extraction trench to extract soil gas vapors under the building and to prevent vapors from migrating under the building in the future; and periodic sampling and analysis to monitor the progress of the intrinsic bioremediation, which uses microorganisms and oxygen already in the soil and groundwater. This alternative has a time frame and cost estimate between alternatives 1 and 3.

Alternative 3 - The third alternative is to take advantage of the intrinsic bioremediation, without containment of contaminants. This alternative is feasible if intrinsic biodegradation is taking place at a rapid pace (faster than plume migration) as identified by the data collection plan outlined below. No construction or operations and maintenance would be required, only periodic sampling and analysis to monitor the cleanup progress. This alternative has the lowest estimated cost and the greatest uncertainty in time of remediation (approximately 5 years).

The comparison of 1992/3 to 1995 data shows that intrinsic biodegradation has taken place, but does not provide enough information to determine the rate. We recommend that additional round of sampling be performed to provide data for 1996 for further evaluation. This sampling round would be required to pursue the second and third alternatives listed above. The estimated cost to implement each alternative is shown in the attached table.

Additional Data Collection Plan

The additional data collection will include the following tasks: 1) Drilling two additional soil borings and installing two additional monitoring wells; 2) Sampling of existing monitoring wells and the new monitoring wells.

Two new soil borings will be drilled, one just south of former boring location AH-2 and one near former boring location AH-4. The soil boring will be drilled using hollow stem auger techniques. Soil samples will be collected on a continuous basis, from two feet below ground surface to the terminus of the boring, using a split-spoon sampler. Soil samples will be screened in the field, for the presence of volatile organic compounds (VOCs), using a portable photoionization detector (PID). If field screening indicates the presence of elevated VOCs, selected soil samples will be submitted to an analytical laboratory for BTEX, MTBE and PNA analyses. If there is no evidence of VOCs, soil samples will not be submitted to the laboratory.

Upon completion of each borehole, a monitoring well will be installed. Each well will be constructed using flush threaded, two inch diameter PVC, .010 slotted screen and two inch diameter PVC, solid riser casing to existing grade. The well screens will be no more than five feet in length and will be installed straddling the water table to allow for seasonal fluctuations and to allow for the entry of possible free floating hydrocarbons. The annular space around each well screen will be packed with a uniform silica sand not more than two feet above the top of the screen and topped with a bentonite seal to prevent surface contamination from entering the well. The top of each well will be cemented inside a flush mount road box, to accommodate vehicular traffic.

The wells will be developed by surging and then bailing to remove fine grained materials from the well screen. Well development enhances the hydraulic connection between the well and the surrounding aquifer, allowing transmission of representative groundwater for monitoring and sampling.

The wells will be located both vertically and horizontally using field survey techniques. The elevation of each well and the top of the water table will be surveyed to within 0.01 foot accuracy, using established site elevation data. An electronic interface probe will be used to determine depths to water in each well and to check for the presence of free floating hydrocarbons.

Water samples will be collected from the two new wells (MW-12; MW-13) as well as from existing wells MW-6, MW-7, MW-8, MW-10, MW-11, PZ-1, PZ-2 and PZ-3 for submittal to an analytical laboratory. The samples will be analyzed for the presence of BTEX, MTBE and PNAs. In addition, one duplicate sample and a trip blank will be submitted to the laboratory for QA/QC control.

The cost for completing this plan is approximately $ 10,000.

At a meeting on March 6, 1996, we reviewed the proposed alternatives and cost estimates with Mr. Homayoon Pirooz and Ms. Sandra Kenzie of the City of Ann Arbor Public Service Department, Engineering Division. As a result, the City decided to implement alternative 1 since it is expected to achieve levels below Tier I in a shorter time than the other alternatives. Alternative 3 was not selected by the City because it would require a deed restriction on the property and may require the City to enforce control on drinking water from the aquifer.

Alternative 2 was not selected by the City because the time needed to achieve levels below Tier I may be longer than estimated. As a result, the cost for this system may increase, to become equal to that of Alternative 1. Furthermore, this alternative may require a deed restriction. As a result, the city decided to implement Alternative 1, since it is expected to achieve levels below Tier I in a relatively short period and does not require deed restrictions or drinking water control.

TABLE 3
SUMMARY OF SOIL CHEMICAL ANALYSES: TGI SAMPLING EVENTS

ANN ARBOR PARKS & RECREATION GARAGE
NTH PROJECT NO. 13-5001-04

SAMPLE NO.	SAMPLING EVENT	SAMPLE DEPTH (FT)	PARAMETER																				
			POLYNUCLEAR AROMATICS (µG/KG)																BTEX (µG/KG)				LEAD (MG/KG)
			NAPHTHALENE	ACENAPHTHYLENE	ACENAPHTHENE	FLUORENE	PHENANTHRENE	ANTHRACENE	FLUORANTHENE	PYRENE	BENZO (A) ANTHRACENE	CHRYSENE	BENZO (B) FLUORANTHENE	BENZO (K) FLUORANTHENE	BENZO (A) PYRENE	DIBENZO (A,H) ANTHRACENE	BENZO (G,H,I) PERYLENE	INDENO (1,2,3-C,D) PYRENE	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES	
MW-4	JUN 1992	8 - 10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.7
MW-5	JUN 1992	4 - 6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5
MW-5	JUN 1992	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1
MW-7	JLY 1992	9.5 - 11.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
MW-8	MAR 1993	6 - 8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	6,100	15,000	31,000	211,000	-----
MW-9	MAR 1993	8 - 10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	56	150	-----
MW-10	NOV 1993	5 - 7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,500	1,700	860	14,000	-----
MW-11	NOV 1993	5 - 7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-1	MAY 1992	4 - 6	5,600	3,700	6,800	400	ND	400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	255	2,727	278	9,100	-----
AH-2	MAY 1992	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	48	ND	216	-----
AH-3	MAY 1992	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	740	ND	3,300	-----
AH-4	MAR 1993	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	490	2,500	2,300	12,300	-----
AH-4	MAR 1993	8 - 10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,800	7,700	14,000	39,000	-----
AH-6	MAR 1993	4 - 6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-6	MAR 1993	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-17-1	JUN 1992	2 - 4	ND	ND	ND	ND	ND	ND	560	370	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-17-1	JUN 1992	4 - 6	ND	ND	ND	ND	ND	ND	790	710	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-17-1	JUN 1992	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----

---- CONTINUED ON NEXT PAGE ----

TABLE 3
SUMMARY OF SOIL CHEMICAL ANALYSES: TGI SAMPLING EVENTS

ANN ARBOR PARKS & RECREATION GARAGE
NTH PROJECT NO. 13-5001-04

SAMPLE NO.	SAMPLING EVENT	SAMPLE DEPTH (FT)	PARAMETER																				
			POLYNUCLEAR AROMATICS (µG/KG)																BTEX (µG/KG)				LEAD (MG/KG)
			NAPHTHALENE	ACENAPHTHYLENE	ACENAPHTHENE	FLUORENE	PHENANTHRENE	ANTHRACENE	FLUORANTHENE	PYRENE	BENZO (A) ANTHRACENE	CHRYSENE	BENZO (B) FLUORANTHENE	BENZO (K) FLUORANTHENE	BENZO (A) PYRENE	DIBENZO (A,H) ANTHRACENE	BENZO (G,H,I) PERYLENE	INDENO (1,2,3-C,D) PYRENE	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES	
AH-17-2	JUN 1992	2 - 4	ND	ND	790	ND	ND	ND	1,540	1,210	360	450	410	ND	720	ND	1,580	350	ND	ND	ND	ND	----
AH-17-2	JUN 1992	4 - 6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	----
AH-17-2	JUN 1992	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	----
AH-17-3	JUN 1992	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	----
AH-17-4	JUN 1992	2 - 4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	----
AH-17-4	JUN 1992	4 - 6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	----
AH-17-5	JUN 1992	2 - 4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	----
AH-17-5	JUN 1992	4 - 6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	----
AH-761	JLY 1992	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	----
AH-762	JLY 1992	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	----
AH-763	JLY 1992	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	----
AH-771	JLY 1992	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	----
AH-772	JLY 1992	6 - 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	----
LABORATORY-REPORTED METHOD DETECTION LIMIT			330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	10	10	10	30	
P.A. 451 TIER 1 RESIDENTIAL RISK-BASED SCREENING LEVELS	Cs		15,000,000	1,500,000	76,000,000	61,000,000	1,500,000	420,000,000	61,000,000	32,000,000	14,000	1,400,000	140,000	14,000	1,400	1,400	1,500,000	14,000	88,000	24,000,000	11,000,000	200,000,000	400
	LEACHING TO GROUNDWATER		5,500	1,400	120,000	89,000	7,400	150,000	68,000	56,000	14,000	1,400,000	140,000	14,000	3,700	4,200	1,500,000	14,000	100	16,000	4,700	74,000	0.08 (A)

NOTES:

[1] Samples collected by TGI personnel and analyzed by TGI Analytical Laboratories and EQL Laboratories .
[2] µG/KG - Micrograms per kilogrm (= parts per billion); MG/KG - Milligrams per kilogram (= parts per million).
[3] ND - Not detected at or above laboratory-reported method detection limit for indicated parameter.
[4] --- - Not tested for indicated parameter.
[5] (A) - Background, as defined in Rule 701(c), may be substituted as the cleanup criteria if higher than the ceanup criterion.
[6] Cs - Concentration in soil, if not exceeded, is considered safe for human exposure via direct (oral and dermal) contact.
[7] "LEACHING TO GROUNDWATER" - Concentration in soil, if not exceeded, does not require leachate analysis to demonstrate compliance with groundwater criteria.

REFERENCE: Report prepared by Traverse Group, Inc. (TGI) dated April 15, 1994 and titled: Site Investigation for an Underground Storage Tank Release, City of Ann Arbor Parks & Recreation Garage, 415 West Washington Street, Ann Arbor, Michigan.

TABLE 4
SUMMARY OF GROUNDWATER CHEMICAL ANALYSES: TGI SAMPLING EVENTS

ANN ARBOR PARKS & RECREATION GARAGE
NTH PROJECT NO. 13-5001-04

SAMPLE NO.	SAMPLING EVENT	SAMPLE DEPTH (FT)	PARAMETER																				
			POLYNUCLEAR AROMATICS (µG/L)																	BTEX (µG/L)				LEAD (MG/L)
			NAPHTHALENE	ACENAPHTHYLENE	ACENAPHTHENE	FLUORENE	PHENANTHRENE	ANTHRACENE	FLUORANTHENE	PYRENE	BENZO (A) ANTHRACENE	CHRYSENE	BENZO (B) FLUORANTHENE	BENZO (K) FLUORANTHENE	BENZO (A) PYRENE	DIBENZO (A,H) ANTHRACENE	BENZO (G,H,I) PERYLENE	INDENO (1,23-C,D) PYRENE	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES	
MW-1	1992	-----	4,230	2,560	1,500	160	77	60	44	354	37	36	11	21	7	ND	6	6	14,000	21,000	2,600	25,000	0.0045
MW-2	1993	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	-----
MW-3	1993	-----	ND	ND	14	6	8	ND	27	43	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	ND	ND	-----
MW-4	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0034
MW-5	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6	1993	-----	49	168	78	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	79	61	270	1,100	-----
MW-7	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
MW-7	1993	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
MW-8	1993	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	1	10	-----
MW-8	1993	8 - 13	394	306	607	56	38	11	53	87	12	5	ND	ND	ND	ND	ND	ND	89	460	240	2,200	-----
MW-8	1993	18 - 23	41	35	14	ND	ND	ND	6	6	ND	ND	ND	ND	ND	ND	ND	ND	37	119	401	732	-----
MW-8	1993	28 - 33	43	14	50	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	23	96	33	462	-----
MW-9	1993	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
MW-9	1993	10 - 15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
MW-9	1993	20 - 25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
MW-9	1993	30 - 35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
MW-9	1993	40 - 45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
MW-11	1993	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	20	430	1,200	-----
AH-1	1992	-----	11	53.2	56.6	6.5	ND	ND	ND	ND	ND	13.4	ND	ND	ND	ND	ND	ND	9.2	63.3	12.7	21.9	-----
AH-2	1992	-----	69	82	110	57	160	49	230	110	70	87	67	44	76	110	80	60	12.6	26.4	4.7	83.5	-----
AH-3	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6	7.9	ND	12	-----
AH-4	1993	10 - 15	344	380	886	58	42	11	37	36	ND	ND	ND	ND	ND	ND	ND	ND	1,200	520	880	2,200	-----
AH-4	1993	20 - 25	86	354	189	30	8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	970	250	370	960	-----
AH-4	1993	30 - 35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31	15	34	94	-----
AH-4	1993	40 - 45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22	17	44	130	-----
AH-4	1993	50 - 55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	2	6	15	-----

---- CONTINUED ON NEXT PAGE ---

TABLE 4
SUMMARY OF GROUNDWATER CHEMICAL ANALYSES: TGI SAMPLING EVENTS

ANN ARBOR PARKS & RECREATION GARAGE
NTH PROJECT NO. 13-6001-04

SAMPLE NO.	SAMPLING EVENT	SAMPLE DEPTH (FT)	PARAMETER: POLYNUCLEAR AROMATICS (µG/L)															BTEX (µG/L)				LEAD (MG/L)
			NAPHTHALENE	ACENAPHTHYLENE	ACENAPHTHENE	FLUORENE	PHENANTHRENE	ANTHRACENE	FLUORANTHENE	PYRENE	BENZO (A) ANTHRACENE	CHRYSENE	BENZO (B) FLUORANTHENE	BENZO (K) FLUORANTHENE	BENZO (A) PYRENE	DIBENZO (A,H) ANTHRACENE	BENZO (G,H,I) PERYLENE	INDENO (1,23-C,D) PYRENE	BENZENE	TOLUENE	ETHYL BENZENE	XYLENES	
AH-5	1993	10 - 15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-5	1993	20 -25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-5	1993	30 - 35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-5	1993	40 - 45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-6	1993	8 - 13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-6	1993	18 - 23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-6	1993	28 - 33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	ND	ND	-----
AH-17-1	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-17-2	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	3.6	ND	5.9	-----
AH-17-3	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-17-4	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-17-5	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-761	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
AH-762	1992	-----	ND	ND	16	ND	8.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.2	92	-----
AH-763	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9	-----
AH-771	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.6	ND	ND	3.4	-----
AH-772	1992	-----	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-----
LABORATORY-REPORTED METHOD DETECTION LIMIT			5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	1	1	1	3	
P.A. 451 TIER 1 RESIDENTIAL RISK-BASED SCREENING LEVELS	CGW		260	26	1,300	880	26	7,300	880	550	1.2	120	1.2	12	0.2	0.12	26	1.2	5	790*	74*	280*	0.004 (A)
	GSI		29	(B)	4	14,000	(B)	110,000	370	11,000	0.31	0.31	0.31	0.31	0.31	0.31	(B)	0.31	53	110	31	59	0.0066 (A)

NOTES:

(1) Samples collected by TGI personnel and analyzed by TGI Analytical Laboratories and EQL Laboratories.
(2) µG/L - Micrograms per liter (≈ parts per billion); MG/L - Milligrams per liter (≈ parts per million).
(3) ND - Not detected at or above laboratory-reported method detection limit for indicated parameter.
(4) --- - Not tested for indicated parameter.
(5) (A) - Background, as defined in Rule 701(c), may be substituted as the cleanup criteria if higher than the cleanup criterion.
(6) (B) - Chemical has either not been evaluated or an inadequate data base precludes the development of a GSI value.
(7) * - Aesthetic-based criteria--Use of the most restricitve criteria is required, therefore health-based criteria is not presented.
(8) CGW - Concentration in groundwater, if not exceeded, is considered safe for exposure.
(9) GSI - Presented only to establish groundwater criteria which are protective of surface water.

REFERENCE: Report prepared by Traverse Group, Inc. (TGI) dated April 15, 1994 and titled: Site Investigation for an Underground Storage Tank Release, City of Ann Arbor Parks & Recreation Garage, 415 West Washington Street, Ann Arbor, Michigan.

C-549-89
JTS # 130064

MICHIGAN STATE POLICE FIRE MARSHAL DIVISION
UST PROGRAM
SUSPECTED/CONFIRMED RELEASE
Sec. 280.50/280.61 EPA Rules

Person Reporting Release Dan Cullen

Location of Release

Facility Name City of Ann Arbor

Address 415 W. Washington

City/State/Zip Ann Arbor, 48103

County Washtenaw Township _____

Are Tanks Registered with State: Yes / No

Company Mailing Address

Address _____

City/State/Zip _____

Contact Person _____ Phone # _____

Have you notified

DNR: Yes___ No___ ? Local Fire Department: Yes___ No___ ?

Release Information

Type of tank _____ Capacity _____

Substance Released _____

Site Condition (Circle reason for believing a leak may have/has occurred)

Presence of product/vapors in soil/basements/failed tank tightness test

Unusual operating conditions (sudden loss of product/inventory records)

Other _____

DNR field office contacted via TX (date/time)_____
Local Fire Dept. contacted via TX (date/time)_____

Copy of this form sent to: DNR (field) fax FD (information only) ___

Financial Responsibility Letter Mailed _____ Date Received _____
(confirmed release only)

Person Receiving Information Terri Date/Time Received 9/19/89
answering machine

(5/89) ****INTERNAL USE ONLY****

MICHIGAN STATE POLICE FIRE MARSHAL DIVISION
UST PROGRAM
NOTIFICATION OF UST REMOVAL/CLOSURE
Sec. 280.71(a) EPA Rules

Date Received 11/9/89 Person Receiving Information Jerri

Method of Notification: Phone__ Letter X (attach to file copy of form)

Name of Person Giving Information: _____

Location of Tanks

Company Name City of Ann Arbor

Address 415 W. Washington

City/State/Zip Ann Arbor, 48103

County Washtenaw Township _____

Contact Person Don Cullen City of Ann Arbor Phone 313/994-6696

Company Mailing Address P.O. Box 8647
Ann Arbor, 48107

Tank Information

Date Tanks are to be Removed 12/22/89

Number Removed 1 Capacity 1 1,000 2 _____ 3 _____

4 _____ 5 _____ 6 _____

Company Doing Removal

Name _____

Address _____

City/State/Zip _____

RECEIVED
NOV 27 1989
JACKSON DISTRICT
☐ ENVIR. RESPONSE DIV.
☐ SURFACE WATER QUALITY DIV.
☐ WASTE MGMT DIV

Copy of this Form Sent To: DNR (field) X FD (information only) X

Date Sent 11/16/89

Follow-Up Letter Sent (owner/operator): Date 11/16/89

INTERNAL USE ONLY

C-12-22-87

MICHIGAN STATE POLICE FIRE MARSHAL DIVISION
~~UST PROGRAM~~
SUSPECTED/CONFIRMED RELEASE
Sec. 280.50/280.61 EPA Rules

Person Reporting Release Daniel Cullen

Company/Contractor Name City of Ann Arbor

Location of Release

Facility Name City of Ann Arbor

Address 415 W. Washington Street

City/State/Zip Ann Arbor

County Washtenaw Township _____

Company Mailing Address

Address 100 n. Fifth Ave POB 8647

City/State/Zip Ann Arbor 48107

Contact Person Dave Phone # 313/994-6693

Have you notified

DNR: Yes___ No___ Local Fire Department: Yes___ No___

Release Information

Type of tank _____ Capacity _____

Substance Released _____

Site Condition (Circle reason for believing a leak may have/has occurred)

Presence of product/vapors in soil/basements/failed tank tightness test

Unusual operating conditions (sudden loss of product/inventory records)

Other _____

Copy of this form sent to: DNR 1 FD (info only) 2 DMB ✓

Financial Responsibility Letter Mailed _____ Date Received _____
(confirmed release only)

Person Receiving Information CM Date/Time Received 12:00 fax

(10/89) ****INTERNAL USE ONLY****

MICHIGAN STATE POLICE FIRE MARSHAL DIVISION
UST PROGRAM
SUSPECTED/CONFIRMED RELEASE

Facility ID Number 8428 **Incident Number** C-371-92

Person Reporting Release Ann Flaherty
Company/Contractor Name The Traverse Group

Location of Release
Facility Name Parks & Recreation
Address 415 W. Washington
City/State/Zip Ann Arbor, Mi 48103
County Washtenaw **Township**

Company Mailing Address
Name City of Ann Arbor
Address 100 N. Fifth Ave P.O Box 8647
City/State/Zip Ann Arbor, Mi 48107
Contact Person Dan Cullart **Phone #** 313-994-6696

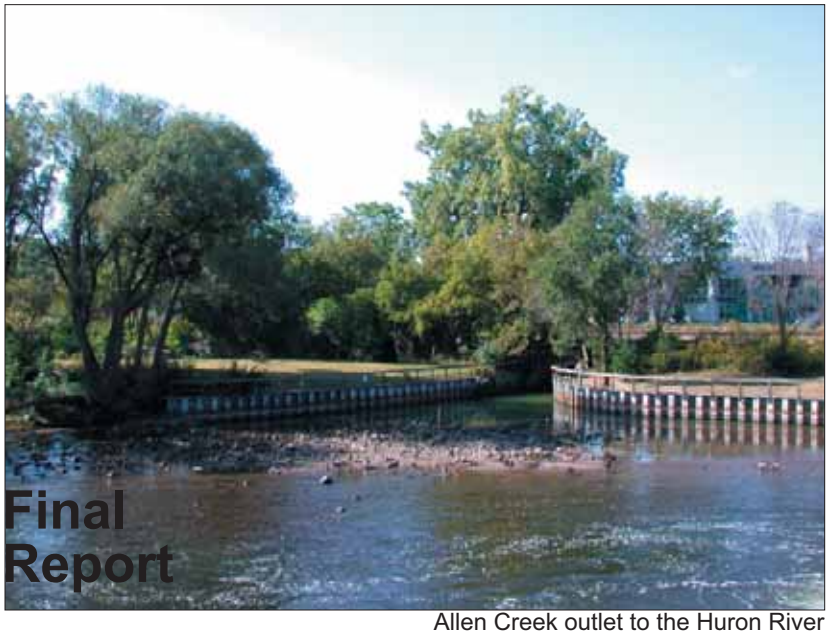
Release Information
Date and Time Release Known 3/6/92 9:50am
Tank: FRP (Steel) Composite **Capacity** 6000
Substance and Amount Released Gas

Site Condition (Circle reason for believing a leak may have/has occurred)
Presence of product/vapors in soil/basements/(failed tank tightness test)
Unusual operating conditions/site assessment showed contamination
Other

Copy of this form sent to: DNR____ FD (info only)____ DMB____
Date/Time Received 3/6/92 4:26pm tx /(fax)/ voice mail
Person Receiving Information Kit Zimmerman

The Allen Creek Greenway ~

Findings and Recommendations



Allen Creek outlet to the Huron River

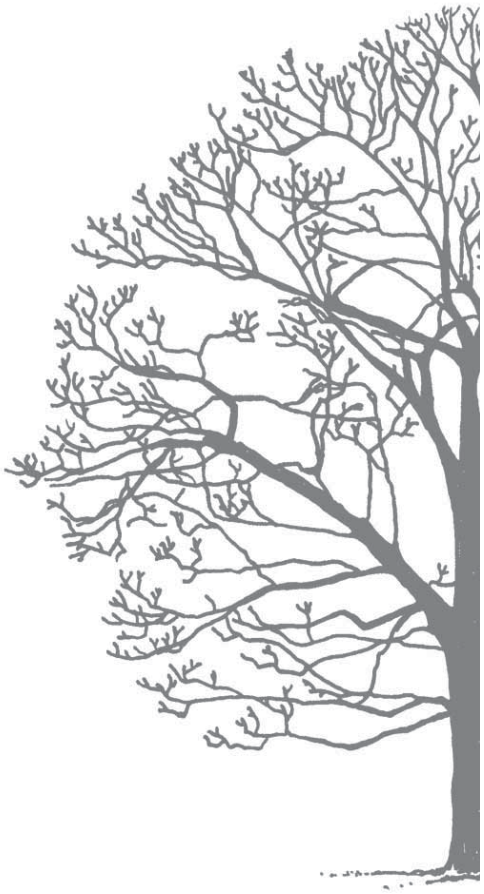
Allen Creek Greenway Task Force
Ann Arbor, Michigan

16 March 2007

Findings
and
Recommendations

A
Report
by

Allen Creek Greenway Task Force



Members

Linda Berauer
Jean Carlberg
James D'Amour
Larissa Larsen
Barbara Murphy
Peter Osler
Peter Pollack
Sandi Smith
Margaret Wong

and
Sue McCormick
City Liaison

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Section 1. Introduction

Help shape the Allen Creek Greenway

A Lecture Series

Joan Nassauer
Professor, School of Natural Resources and Environment

Ecological and Community Benefits of Greenways

Tuesday, **April 11**, 7pm
Detroit Edison Center Ground Floor Community Room (southeast corner of Main and William)

Prof. Nassauer specializes in landscape ecology, landscape perception, design and planning, watershed planning and management.

Tom Woiwode
Director, The Greenways Initiative
Community Foundation for Southwestern Michingan

Successful Greenways in Southeastern Michigan

Tuesday, **April 25**, 7pm
Location TBA

The Greenways Initiative is a five-year project that has helped communities create and expand greenways in seven counties in Southeastern Michigan.

Public Workshops

1A Saturday, April 22; 8:30 am to Noon
1B Saturday, April 29; 8:30 am to Noon

2nd Floor Ballroom, Courthouse Square
100 S. 4th Ave. at E. Huron

This advertisement was paid for by the Ann Arbor Downtown Development Authority in demonstration of their support for alternative transportation and an Allen Creek Greenway

Help shape the Allen Creek Greenway

Community Events

Public Workshop 1A

The Big Picture: Allen Creek Greenway in Context

Saturday, **April 22**, 8:30 am to Noon
2nd Floor Ballroom, Courthouse Square
100 S. 4th Ave. at E. Huron

Tom Woiwode
Director, The Greenways Initiative
Community Foundation for Southeastern Michigan

Successful Greenways in Southeastern Michigan

Tuesday, **April 25**, 7pm
Cobblestone Farm Barn, 2nd Floor
2781 Packard St.

The Greenways Initiative is a five-year project that has helped communities create and expand greenways in seven counties in Southeastern Michigan.

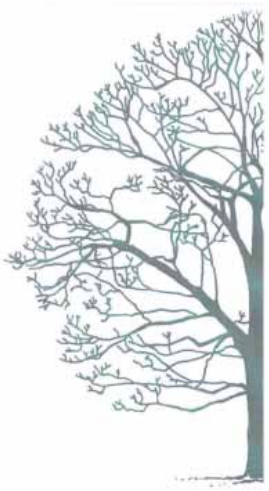
Public Workshop 1B

A Closer Look: Site Specific Proposals for the City's Parcels

Saturday, **April 29**, 8:30 am to Noon
2nd Floor Ballroom, Courthouse Square
100 S. 4th Ave. at E. Huron

This adv
demonstr

Help shape the Allen Creek Greenway



Public Workshop 1B
A Closer Look: Site Specific Potentials for the City's Parcels

Saturday, April 29, 2006

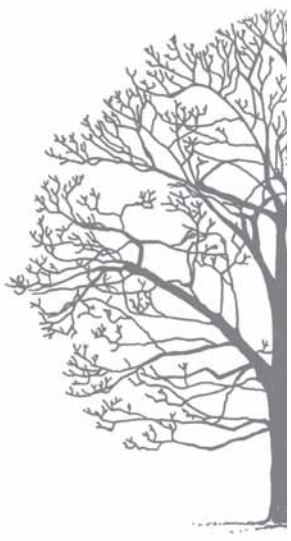
AGENDA

8:30 a.m.	Registration and information displays
9 a.m.	Presentation
10 a.m.	Break
10:15 a.m.	Facilitated brainstorming and discussion of three city-owned sites
11:55 a.m.	Adjournment

OBJECTIVE: To consult the public on the potential of the Greenway and specifically on how to incorporate the city owned properties that are a part of its path.

This workshop was funded by the Ann Arbor Downtown Development Authority in demonstration of its support for alternative transportation and an Allen Creek Greenway

Help shape the Allen Creek Greenway



Presentation and Public Comment

The Greenway to Date ~ City Sites and Connections

6:30 pm
Wednesday
August 2

2nd Floor Ballroom, Courthouse Square
100 S. 4th Ave. at E. Huron

Agenda

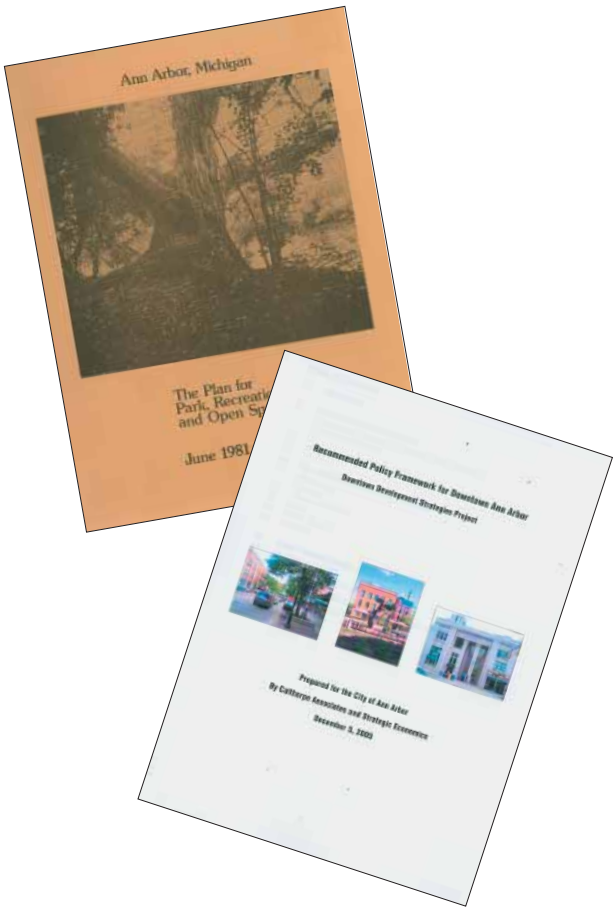
6:30 pm	**Registration and information displays**
6:45 pm	**Presentation**
7:45 pm	**Q & A**
8:00 pm	**Public comment**
9:30 pm	**Adjournment**

OBJECTIVE: To hear reactions from the public on the evolution of the Greenway to date. More specifically, to discuss preliminary proposals for the treatment of city-owned properties in the Allen Creek valley and the connections between them.

For more information:

www.a2gov.org/greenway
and
ACGreenway@ci.ann-arbor.mi.us

This advertisement was paid for by the Ann Arbor Downtown Development Authority in demonstration of its support for alternative transportation and an Allen Creek Greenway



Section 1: Introduction

This report and its supporting documentation are products of an effort, guided by the Allen Creek Greenway Task Force (ACGTF), to substantiate the potential for an Allen Creek Greenway. The idea of an open space and pathway generally following the Allen Creek storm drain has been discussed for decades. The topic's presence in the City's planning documents can be traced back to the 1981 *Plan for Parks, Recreation and Open Spaces*.

The pattern of community events and City studies over the last few years involving urban development in general, and potential impacts on the downtown in particular, include the Downtown Residential Density Task Force (citizen volunteers, Sept. 2004) and the Recommended Policy Framework for Downtown Ann Arbor (Calthorpe Associates, Dec. 2005). These studies and supportive citizen advocacy helped lead to City Council action establishing this task force to consider the Allen Creek valley as a greenway. Council's enabling Resolution, R-285-6-05, can be found on page 6 of this Introduction.

Work of the Task Force

Since its beginnings in September of 2005, the ACGTF has been gathering data in the attempt to define and frame key factors to consider; evolve options for the three City-owned sites and the connections between them; seek comment from the Ann Arbor community; and pursue consensus within the Task Force so as to present recommendations consistent with Council's enabling resolution. This report summarizes these activities and the process leading to the Task Force's findings.

As a final report to Council and the community, it is intended to accomplish two primary purposes:

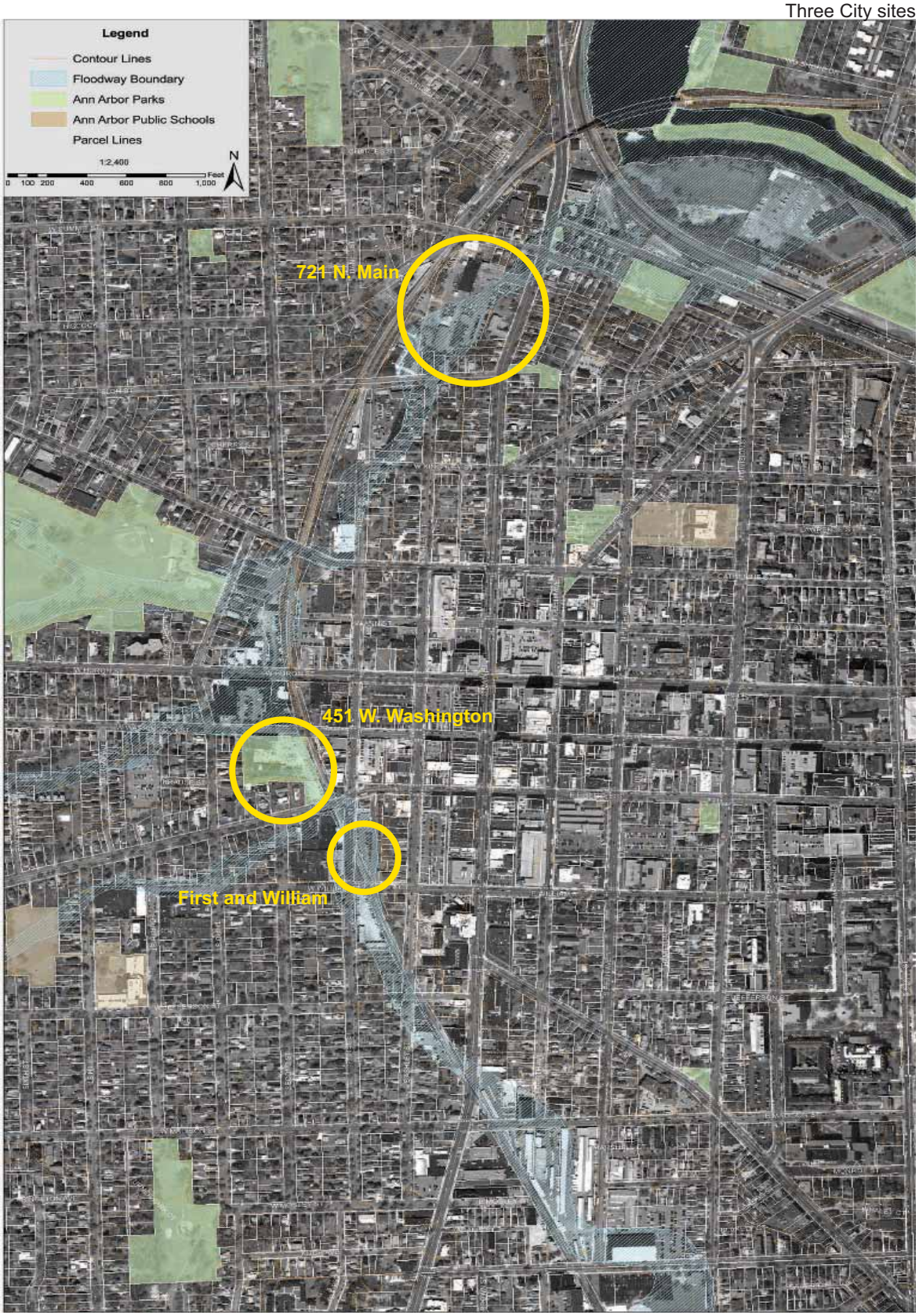
1. **objectively present key considerations, and,**
2. **offer recommendations and options based on clearly defined priorities.**

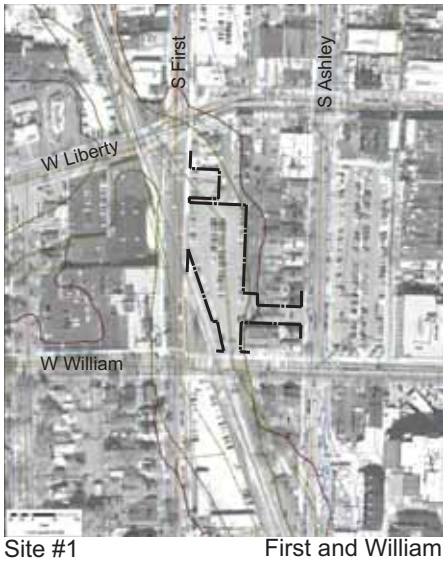
The Task Force reached consensus on several aspects of establishing a greenway in the Allen Creek valley.

First, and most significant, is agreement that there can and should be an Allen Creek Greenway, and that, at a minimum, it should occupy the floodway portion of the City's sites in the Creek's floodplain.

Second, the Task Force authored a Vision, Definition and 12 Planning Principles to help guide community discussion.

Three City sites





Site #1 First and William

Site #2 415 W. Washington

Site #3 721 N. Main

Third, the community should take a long term view toward continuing to refine the vision along with short term actions to begin implementation.

The Task Force also reached consensus about how to treat one of the three sites listed below that the City owns along the route of the Greenway. The three sites are:

- **First and William Streets** parking lot, a Greenway garden recommendation
- **415 West Washington** City maintenance yard, with alternatives A, B & C
- **721 North Main** City maintenance yard, with alternatives A & B

Findings and Recommendations

This report is presented in six sections to facilitate use of its content:

1. **Introduction ~** the background and approach to this study
2. **Context ~** a discussion of both area-wide and site specific considerations
3. **Recommendations ~** a description of possibilities
4. **Implementation ~** next steps and conclusions
5. **Appendix ~** information related to the findings
6. **Supplemental appendix ~** additional background and general information.

As suggested above, the Task Force has attempted to collect, consider and communicate findings in 2 categories: key factors, which tend to be objective by their nature; and, recommendations, which are based on the interpretation of facts and tend toward opinion.

A note of appreciation is offered to City staff who kept ACGTF members informed as our discussions proceeded to evaluate and prioritize data. We wish to thank Council for giving us the opportunity to work together, and to thank the citizenry who attended regular meetings, lectures and the 3 workshops, who sent email, and who care so deeply about this community.

Lastly, as a City Task Force, the focus by necessity has been on existing City or other publicly owned property, including streets, sidewalks and easements. While we are aware of the implications of this study on adjacent privately owned land, that specific discussion must be left for others as part of next steps.

City Council Resolution, 15 August 2005

D-8

R-258-6-05

RESOLUTION CREATING A TASK FORCE TO PLAN A NEW GREENWAY

Whereas, The City of Ann Arbor has expended considerable resources over a period of years in the creation of a beautiful and scenic Greenway along the Huron River that is used yearly by thousands of walkers and cyclists;

Whereas, The Huron River Greenway will extend "border to border" across the City along the river and link up to riverfront parks and other greenways that will stretch out beyond the City limits connecting to still more greenways;

Whereas, This great Huron River Greenway is nearing completion and will require further staff work and investment and must remain a priority even as plans are developed for the new Greenway addition;

Whereas, The opportunity and desire exists to create yet another Greenway along the Ann Arbor Railroad tracks that will connect to and complement the Huron River Greenway and allow still more City residents to enjoy the benefits of walking and cycling on green pathways;

Whereas, This new Greenway could place a pathway along the western edge of Downtown and beyond to the South and to the North to the Huron River Greenway;

Whereas, If this new addition to the Greenway system of Ann Arbor is to become a reality, work needs to begin soon, the Ann Arbor Railroad needs to be further engaged in conversation with the goal of obtaining an easement or easements, and grant funds need to be pursued;

Whereas, The path of this new Greenway could intersect with three City owned parcels: the current City Garages at 415 W. Washington and 721 N. Main, and the City owned surface parking lot at First and William;

Whereas, Any Greenway path shall include the possibility for future rail transit use;

Whereas, The City is building a new maintenance facility and plans to vacate all or some of the City owned land at 415 W. Washington and 721 N. Main when garage operations are moved to the new site;

Whereas, The First and William site will be needed for parking for at least three years as new parking is developed;

Whereas, A task force made up of City residents, residents who serve on City boards, and City Council, will be needed to work with City Staff to develop a recommendation to City Council for the development of the new Greenway that will complement and connect to the existing Huron River Greenway;

D-8

Whereas, A planning effort for the downtown area is underway and the City has engaged Calthorpe Associates to work with residents, City Staff, the Downtown Planning Steering Committee, the Planning Commission, the Downtown Development Association and City Council; and

RESOLVED, The City Administrator shall begin substantive discussions with the Ann Arbor Railway to gain their cooperation in the creation of a Greenway along the Railroad Right of Way;

RESOLVED, That City Council will, no later than September 6, 2005, appoint a nine member task force that will serve until September 30, 2006, to work with City Staff and others involved in the Downtown planning process to develop a recommendation for a new Greenway that will follow roughly along the Ann Arbor Railroad Right of Way to the west of Downtown and connect with the existing Huron River Greenway;

RESOLVED, The New Greenway Task Force will include one member of the Parks Advisory Commission, one member of the Planning Commission, one member of the Downtown Development Association, one member of City Council and other City Residents.

RESOLVED, The New Greenway Task Force will develop a preliminary recommendation to be delivered to the Downtown Planning Steering Committee no later than November 1, 2005, and a final recommendation to be delivered to the Planning Commission, The Parks Advisory Commission and City Council no later than October 1, 2006. To assist the Task Force in making its recommendations, it shall conduct a series of public workshops, and consult with independent design, parks, and watershed professionals, in addition to its work with City Parks and Planning Staff and Commissions;

RESOLVED, That the area of the City properties at 415 W. Washington and 721 N. Main within the floodway will be included in the new Greenway. The remaining portion of these sites will be reserved for mixed use, which could include additional park or Greenway area, space for non profit organizations, art, housing, and/or commercial entities; and

RESOLVED, The New Greenway Task Force will include in its final report a recommendation for the eventual use of the City owned property at First and William that is currently used as a surface parking lot.

Sponsored by: Mayor Hieftje and Council Members Johnson, Easthope, Woods, Greden, Teall, Lowenstein and Carlberg

As Amended August 15, 2005

APPROVED
BY ANN ARBOR CITY COUNCIL

August 15, 2005

CITY CLERK
ANN ARBOR, MI

Section 2. Context

721 N. Main

The three City sites seen from the Southwest

415 W. Washington

First and William

Section 2. Context

The process of collecting, understanding, evaluating and using data was key to reaching closure for the Task Force's report. Determining what was available was the initial step; judging its relevance was the next step. Data that was out of date, incomplete or unavailable soon surfaced. Contemplating the role and significance of missing information was an exercise in moving forward with care; resolving how to use mixed levels of data was critical to issuing this report with clarity and transparency.

The time frame given the Task Force to provide recommendations required use of currently available specific data and of the conceptual level implications of data not yet available. Uneven information could not be treated as an inhibitor to decision-making; it was but another factor to evaluate.

Considerations
The information that follows has been gathered into categories to objectively present key factors both individually and as one item might influence the others. Findings are a synopsis of each subject covered. More complete documentation of data can be found in the attached Appendix and Supplemental Appendix.

Categories used to consider and frame recommendations for the Greenway in the Allen Creek valley include:

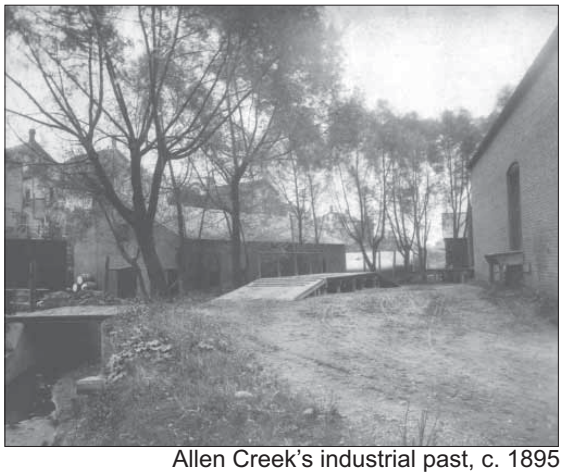
- City setting
- A brief history of Allen Creek
- On-going policy efforts
- The valley as City landscape
- The valley as Greenway
- The floodplain and water management
- Open space and recreation
- Safety
- Economic impacts
- Changes in time

City Setting

The role of a downtown today is different from that of the past. Downtown was the place for a community's economic, social, cultural, educational and recreational activities. Post World War II's automobile use and new development patterns changed the very nature of urban life in the United States by spreading and diversifying the locations where people could live, and where goods and services could be found. Today, use of the "electronic highway" (the internet) is changing social, cultural and economic patterns once again.

Activity along Huron Street, c. 1908

A summer's eve on Main Street, c. 1990



Allen Creek's industrial past, c. 1895

Ann Arbor's center has evolved, too, and remains a place where people work, go to school, play and, to a lesser degree, live and shop. Efforts are underway to increase Central Business District (CBD) activity by changing zoning to encourage a more residential downtown. Adjacent residential neighborhoods, several with historic district designations, also contribute to the numbers of people living within easy walking/biking distance of downtown.

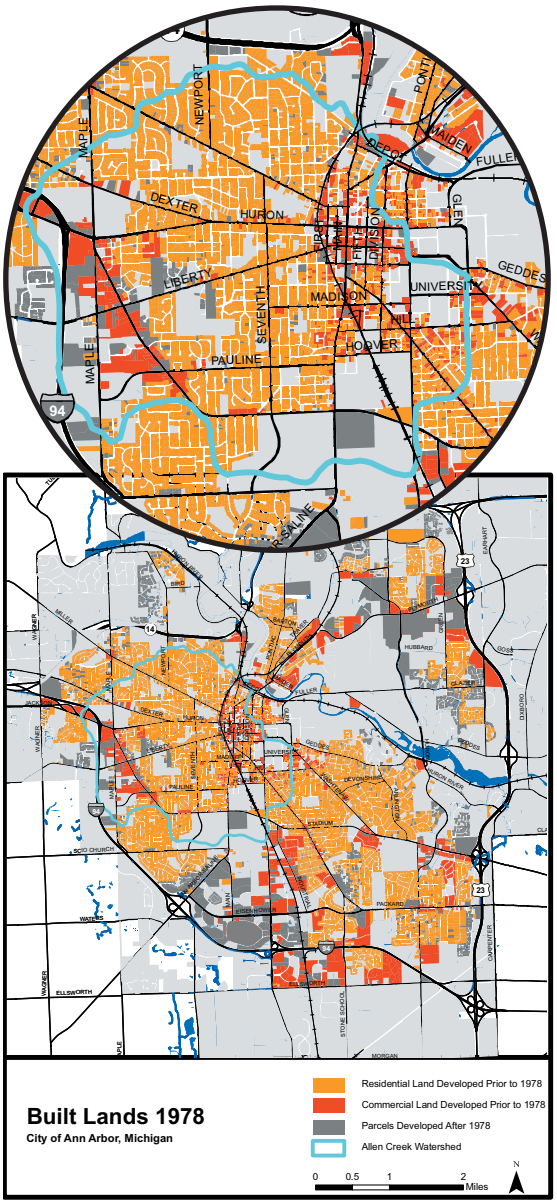
The experiences one has in and adjacent to our downtown are derived from the sum total of its interior and exterior spaces, and its various venues for events and activities. Downtown is also the product of human actions over time. Its character evolves from the combination of daytime and nighttime, weekday and weekend, academic season (grades K-12 and The University's calendar), the natural cycle of spring-summer-fall-winter seasons, and the cultural calendar including University Musical Society, Ann Arbor Symphony, Summer Festival, the Art Fairs, parades, etc. Audiences for this rich and eclectic menu vary as much as the events themselves.

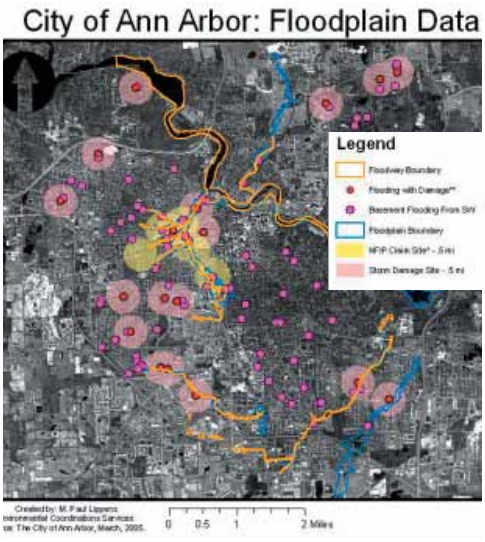
At the same time, urban and built amenities are incomplete without a complementary natural infrastructure that includes, but can go beyond, a typical suburban park. The Huron River, while not distant in miles, is outside the typical perception of Ann Arbor's downtown. The Allen Creek Greenway can help to change that current reality.

A Brief History of Allen Creek

Named in 1824 after one of Ann Arbor's founders, John Allen, Allen Creek helped form the City's identity. Settlements were built along the creek to take advantage of a ready source of water. As the 19th century progressed, industries that required water located there, too: a flour mill, tanneries, a foundry, and breweries, among others. The flat, floodplain topography of the valley, and the industries within it, led the Ann Arbor Railroad in 1878 to lay its tracks parallel to the creek. By century's end, the pastoral nature of the lower Allen Creek valley had changed to an industrial one, and the water quality and ecosystem of the creek diminished.

Residential development in the late 19th century immediately to the west of the main branch resulted in the continuing increase of impervious surface in the creek's catchment area. That area is now the historic neighborhood known as the Old West Side. By the early 1920's, the creek's water quality was such that property owners demanded the City put the creek into a storm sewer.





The main stretch of the creek was piped in 1926, and the lower segments of the main branches shortly thereafter. As development continued, so did the amount and rate of runoff entering the drain and, subsequently, the Huron River. Major flooding events occurred in 1947 and 1968.

The City enacted its first rainwater management ordinance in 1978. Even though the creekshed was largely developed by then, the high rate of runoff from pre-ordinance, undetained areas continued to damage the creek's stream-channels, which occasioned further piping such as the Liberty-Glendale project in 1997. City records indicate that, of the National Flood Insurance Program claims (NFIP) filed City-wide between 1988 and 2001, 100% were in the Allen Creek watershed and within a quarter mile of its floodplain. A total of 18 public claims were processed in those 21 years, with a value/payout of $104,000, or $5,778 per claim. There is not a corresponding public record of private insurance claims or other unreported damages.

While more recent City projects such as Liberty Street and Stadium Boulevard reconstructions have included rainwater management components, much remains to be accomplished.

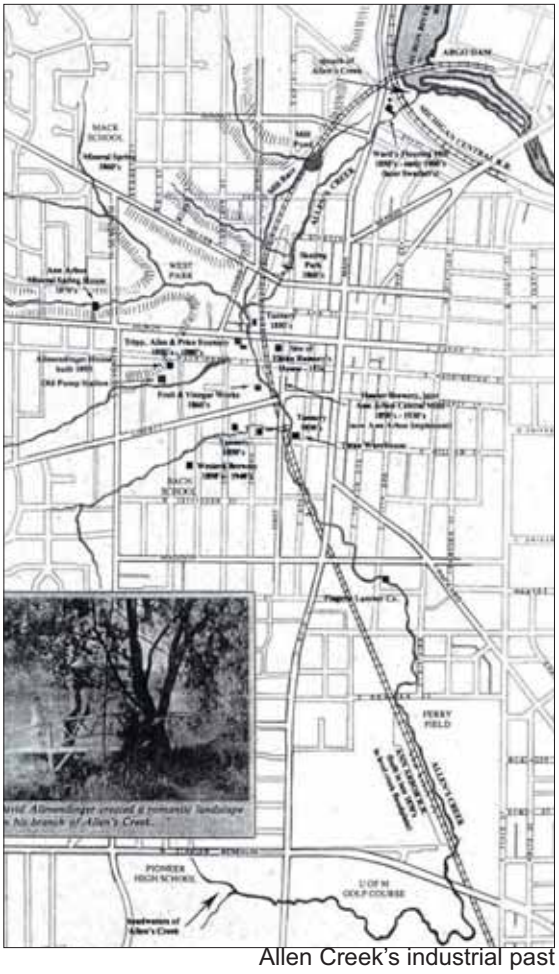
On-Going Policy Efforts

Two policy areas that affect the health and disposition of the Allen Creek watershed are:

1. rainwater, floodplain and hazard mitigation policies, and
2. planning, zoning and development policies.

The City has been grappling with the issue of rainwater and flood hazard management for many years. An annotated history of the past ten years' efforts, some of which are specific to Allen Creek, is included in the Appendix. Recent activity will soon result in the release of new Federal Emergency Management Agency (FEMA) floodplain maps and the drafting of a Flood Hazard Mitigation Plan. A new Request for Services, issued by the Office of the Washtenaw County Drain Commissioner (Allen Creek storm sewer is a County drain), will begin the process of dynamic modeling in the Allen Creek drain. Planning Commission is working on a new comprehensive floodplain policy as the City continues to contemplate increased density in the downtown.

The City has been engaged in conversations about increasing downtown density through development as a way to foster a lively and stimulating city center and increase the tax base.



Allen Creek's industrial past

The balance between increasing development and open space was an issue raised often in the campaign for the greenbelt millage and the Calthorpe study's public workshops.

The opportunity exists for the City and County (the latter with its authority over the storm drain) to consider policy on floodplain and rainwater management, and for the City to address policies guiding development in the downtown and close-in neighborhoods at the same time. Within this context, the Allen Creek Greenway should be viewed as the linchpin between considerations of increased core density and floodplain planning policy.

The Valley as City Landscape

Allen Creek was infrastructure for 19th century Ann Arbor. Even with the creek underground for decades, the valley's significance remains.

The bottom of the valley, at this moment in time, is largely a "keep out" or "pass by" zone. Its personality is witness to the Ann Arbor Railroad's safety and no trespass rules; other adjacent private mixed use property; and limited access at the 415 W. Washington and 721 N. Main municipal yards, Fingerle Lumber storage yards and U-M's property. Some of the area's appearance can be judged unsightly and unfriendly.

The valley also links a variety of distinctive neighborhoods, districts and features. Its south end is rooted in the University's golf course and athletic campus, and running successively North through the Lower Burns Park and Pioneer High/Allmendinger neighborhoods, the Downtown, the Old West Side (OWS), the North Central Property Owners Association (NCPOA), and the Spring-Brooks-Fountain neighborhood where it connects to the City's Huron River Greenway and the County's Border-to-Border Trail. The floodplain runs alongside or near the commercial areas at South State and South Industrial, the Downtown, Kerrytown, and the North and South Main mixed-use corridors.

The Valley as Greenway

Communities across the country are working to develop greenways with multi-use trails serving both recreation and commuter needs. Trails can play a vital role in improving communities offering an innovative means of revitalizing urban areas, reusing degraded lands, and balancing density with

AARR tracks crossing city streets

City-owned parcels in the Allen Creek valley

multi-purpose open space. The concept of greenways evolved as a form of adaptive environmental re-use and is becoming a key component of urban infrastructure. As a growing body of literature demonstrates, urban greenways respond to a number of community values and can fulfill a variety of objectives ranging from rainwater management, improved water quality, aquifer protection, and habitat preservation to non-motorized transportation, open space, and economic development.

In Ann Arbor, the idea of a greenway following Allen Creek goes back to the 1981 Plans for Parks, Recreation and Open Spaces (PROS), and again had a prominent place in the 1988 Downtown Plan. Each successive PROS Plan has included the goal of an Allen Creek Greenway. In March 2005, the Ann Arbor Park Advisory Commission passed a resolution recommending that City Council dedicate the floodway portions of the three publicly owned parcels in the Allen Creek valley as anchor parks in the Greenway. The resolution also called for active public input into determining appropriate community uses for the flood fringe portions of the parcels.

Later in 2005, several hundred citizens participated in three public workshops conducted by Peter Calthorp & Associates to solicit public input in planning the future of downtown. At these workshops, citizens expressed a strong desire for a Greenway along the Allen Creek valley at the western edge of downtown. This, along with continued citizen-initiated efforts, became part of the impetus for Council to establish the Allen Creek Greenway Task Force to study the possibilities for an Allen Creek Greenway.

The Task Force's consensus recommendation is in support of the floodway portion of the floodplain on the three City-owned sites becoming the Greenway. The question remaining for Council and the community to consider is the extent to which the Greenway's open spaces might utilize additional portions of the soon-to-be-vacated City-owned maintenance yards. Discussion of this aspect of the recommended Allen Creek Greenway, and its longer term future, will need to include the emerging presence of the Allen Creek Greenway Conservancy, and the constraints and opportunities of City government.

Our Watershed

Image Credit: City of Ann Arbor

Our Sub-Watershed

Image Credit: City of Ann Arbor

Floodplain Land Use, 2005

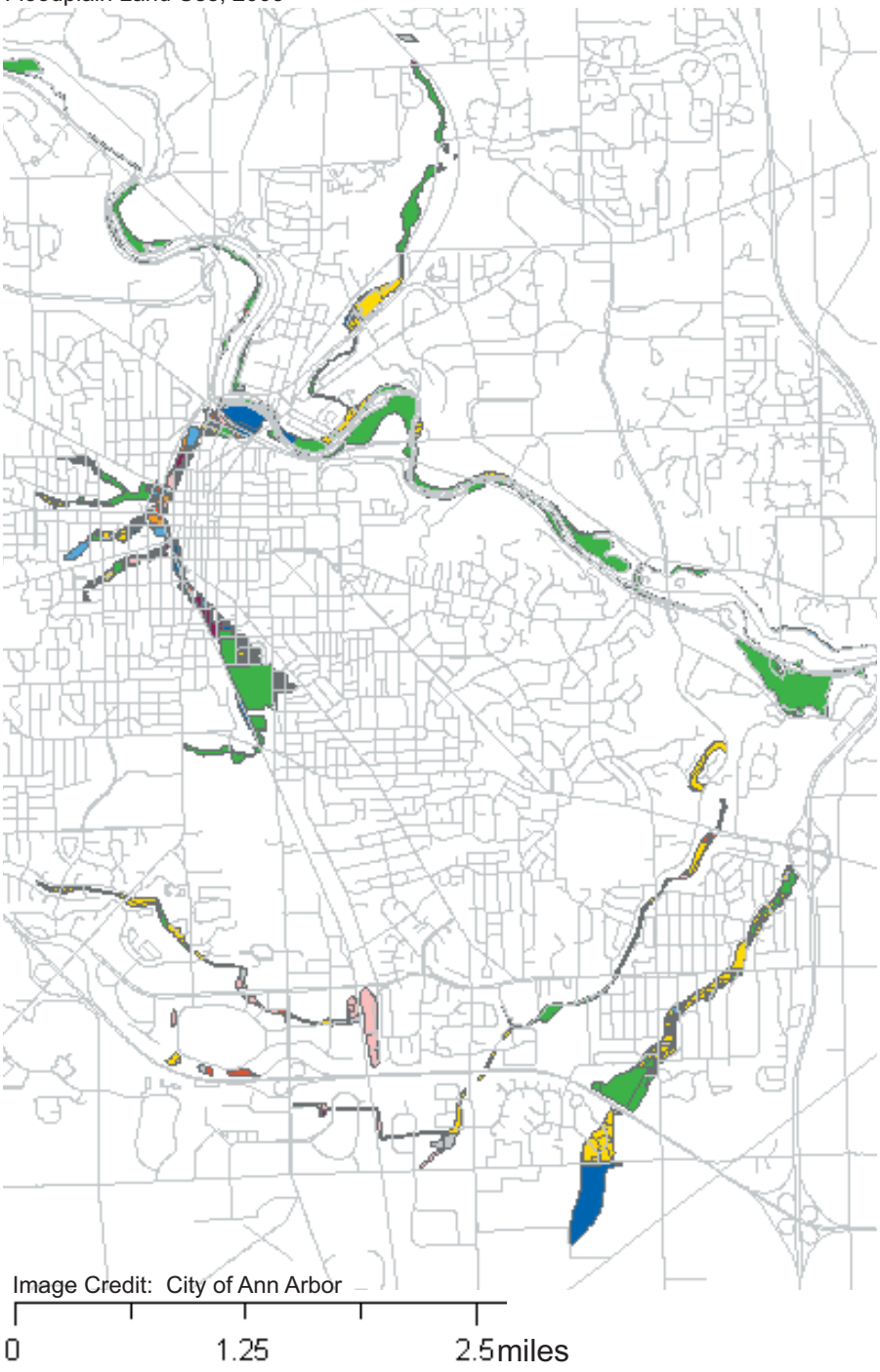


Image Credit: City of Ann Arbor

By Parcels: 1409 total
879 are residential

By Area: 1195 acres
165 acres of residential

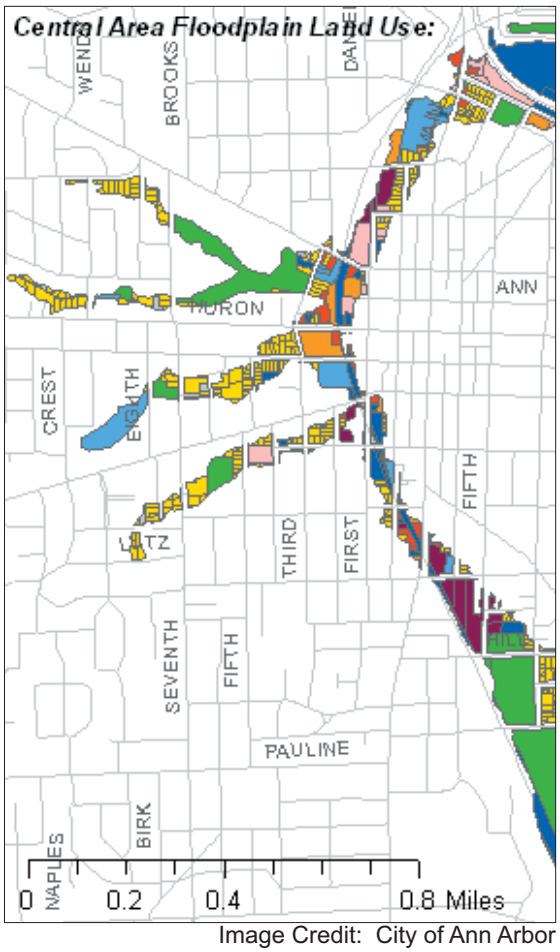


Image Credit: City of Ann Arbor

Legend

Floodplain Land Use

- Residentiial
- Office
- Commercial
- Industrial
- Trans-Com-Utility
- Public - Semi Pub
- Recreational
- Vacant
- Mixed Use
- Roads

The Floodplain and Water Management

The combination of rainwater and runoff are what many in the community believe to be a major consideration in determining the form and substance of the Greenway. The topic is also one with uneven levels of existing information.

The Task Force engaged this discussion in two ways:

- a conceptual, big picture approach to the role and use of a floodplain; and,
- a more specific consideration of rules and regulations governing how one is permitted to use a floodplain.

In other words, community acceptance of existing laws enabling an owner to either develop new buildings or to rehab and re-use existing buildings in a floodplain is a different policy from no longer allowing such development to occur. The community needs to engage in this discussion and determine its floodplain policy consistent with core values, both public and private.

Existing laws and requirements governing development within FEMA floodplain boundaries are:

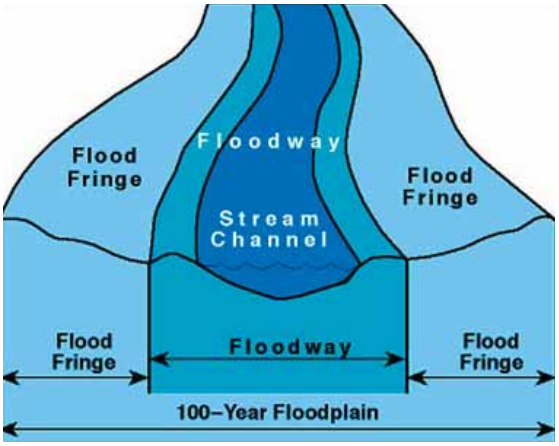
1. **General Criteria**
   - Construction projects within the Allen Creek Drain's 60' wide easement require a permit from the Washtenaw Country Drain Commissioner. Architectural construction within the easement is typically not allowed.
   - Construction projects within the floodplain require a permit from the Michigan Department of Environmental Quality (MDEQ).
   - Federal, State, County and City all require no net loss of flood storage capacity, i.e., no fill without compensatory dredging.
   - Flood flow may not be obstructed in a manner that causes a rise in flood elevations at the property line.

2. **Criteria within a Floodway**
   - State law prohibits new or expanded residential uses within a floodway.
   - The lowest floor of any new non-residential must be one foot above the 100-year flood elevation.

3. **Criteria within a Flood Fringe**
   - The lowest floor of any new residential or non-residential must be one foot above the 100-year flood elevation.

4. **Criteria for Rehabbing Existing Buildings**
   - If renovation of a residential building within a floodplain exceeds 50% of the value of the structure, the first floor of the building must be elevated to one foot above the 100 year elevation.
   - If the building will be non-residential, and renovation exceeds 50% of the value, it can either be elevated to one foot above the 100 year flood elevation or flood proofed.
   - If the building footprint is not going to be increased, and the added value will be less than 50% of the value of the building, no floodplain requirement exists.

5. **Criteria for Historic Properties**
   - Modifications to historic properties that do not increase the building footprint are exempt from floodplain requirements in the state building code.



A floodplain is the horizontal dimension equal to the floodway plus the flood fringe, and the vertical dimension, or topographic elevation, of the 100 year storm event.

The floodway is the land area adjacent to a channel that carries and discharges the base flood flow of a stream or river.

The flood fringe is the dimension between the floodway limit and the 100 year floodplain line. This location, when under consideration by the Task Force, is where alternate, City-owned site-specific recommendations emerge in response to different interpretations and priorities. A discussion beyond the direct role of the Task Force, the status of all 6 creeks' floodplains within the City is a central component of the community's continuing floodplain policy conversations.

The Allen Creek **floodplain maps** are outdated, and new draft maps will soon be available. It's likely that the location of the floodway and 100 year floodplain lines will change. The concept and principles stating that, at a minimum, the Greenway will occupy the floodway portion of the floodplain remains valid regardless of the actual location of that line.

The topic of **rainwater management** and treatment of runoff is directly related to the floodplain. The three City sites are located in the lower third of the Allen Creek watershed. The middle and upper reaches of a watershed are where the most benefit is gained by detaining runoff; lower reach runoff should enter the receiving water body (in this case, the Huron River) sooner

7/23/99 Depot Street

than later thereby spreading the impact of concentrated runoff at lower flow rates and over a longer period of time. In effect, detaining large amounts of runoff on these three City sites as part of a greenway is not recommended for reasons of location in the watershed, and such storage could negatively impact the location of floodplain limit lines and impede the flow of flood water through these sites.

Surface flooding begins along the Allen Creek storm drain at approximately a 1.5 year storm event, which is equal to the "bankfull storm event" as defined by the Office of the Washtenaw County Drain Commissioner, or approximately 2.3 inches of rain in a 24-hour period. Storing volumes of water beyond the bankfull event on the three City sites could interfere with flooding patterns and is not recommended by City staff. Controlling the bankfull storm event for the runoff from each site would provide water quality benefits without significantly exacerbating flooding.

In all instances, and in any location within a watershed, rainwater management goals, in order, are:

1. **reduction in runoff**
2. **water quality best management practices**
3. **detention/retention.**

The three City sites are appropriate locations to implement measures to decrease runoff and improve water quality onsite and, if possible, from the adjacent landscape.

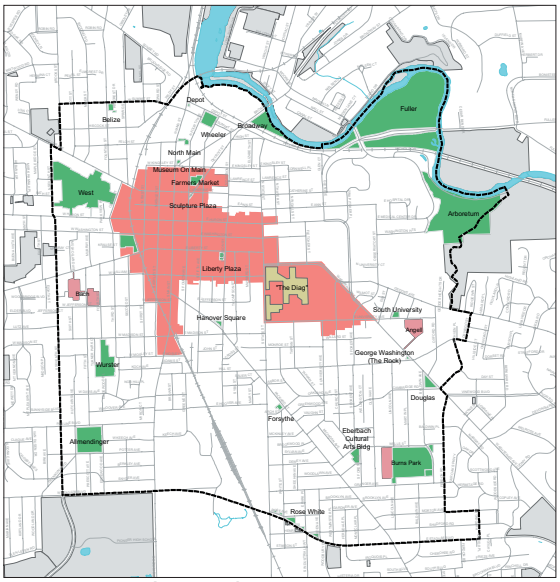
Recreation ~ Public Open Space

Campus at South State & North University

Allen Creek runs along the western edge of the approximately 270 acre Central Business District (CBD). The CBD is roughly contiguous with the Downtown Development Authority (DDA) district. Of the total DDA area, 80 acres are public rights-of-way. The area of the two City-owned parcels in the CBD is 3.5 acres, or about 0.2% of the non-right-of-way land area of the DDA district. The 5.1 acre N. Main site is outside the DDA boundary.

The CBD contains various types of open space. The University of Michigan Central Campus "diag" and its adjoining lawns, courtyards, gardens and plazas is one example. Another is in the heart of the downtown: the Dean Promenade on Main Street, which, with its broad sidewalks, streetscape, and restaurants, provides a delightful urban experience. These dining and socializing sidewalk activities occur in other locations including Liberty, Washington and State, and on private property where building setbacks allow.

Magic Carpet Mornings at Liberty Plaza



Legend

- Planning Area Boundary
- Railroads
- Highway
- Surface Street
- Central Business District
- Rivers, Lakes & Streams
- Ann Arbor City Parks
- Ann Arbor Public Schools
- Ann Arbor Township
- Pittsfield Township
- University of Michigan
- Wash County Drain Commission
- Washtenaw County

Park System Properties in and near the CBD

There are four properties within the CBD that are urban City parks. These include Liberty Plaza (0.26 acre), Sculpture Plaza (0.09 acre), the Farmers Market (1.06 acres), and the historic Kempf House (0.13 acre).

Several neighborhood parks lie in areas adjacent to the CBD: North Main Park (0.47 acre), Wheeler Park (1.93 acres) and West Park (22.93 acres), which function as neighborhood parks with play areas.

The Parks Advisory Commission and staff, in planning parks, recreational amenities, and open spaces to be incorporated in the City's public park system, considers the CBD and the central neighborhoods surrounding it as the Central Planning Area. Its boundaries are Stadium Boulevard, Seventh Street and Summit Street and the Huron River. According to the 2006 PROS Plan, this 1552 acre area contains the highest density and lowest per capita amount of public park and open space in the City.

Planning Area	% Park Acres	Park Acreage/ 1000 persons	% Neighborhood Park Acres	Neighborhood Parkland/ 1000 persons
Central	7.90	4.62	18.75	1.66
Northeast	43.00	26.16	27.08	2.60
South	17.00	11.91	32.64	2.60
West	32.10	21.78	21.53	2.89
CBD	1.54	0.57		

Within the 270 acre CBD, the ratio of park and open space to people is lowest at 0.57. The addition of new residential units within the CBD will decrease this ratio further. Whether or not one adopts the view that standards for the amount of park and open space in the CBD should differ from those for residential neighborhoods, the data is part of the information to consider as possibly influencing the Greenway's final form.

Other recreational opportunities

The Center for Disease Control and Prevention reports that 60% of our population is not getting enough physical activity. The City of Ann Arbor Non-Motorized Transportation Plan recommends bike routes in the downtown and throughout the City, which would provide good access to the Allen Creek Greenway from different parts of the City. There is great interest in increasing walking and biking opportunities; the Greenway would provide both a destination and a path for those activities.

Safety

In the public space of urban parks and greenways, personal security, both actual and perceived, is critical to users. Women, the elderly, children, and people with disabilities often feel particularly vulnerable in public spaces that evince any degree of risk or perceived risk.

While tension can exist between public use and what is best for environment, the two goals – environmental integrity and public use – can coexist. The relevant literature indicates that the spatial design of parks, levels of use, programming, lighting, maintenance, and enforcement contribute to the safety of urban parks. There is a growing body of environment-behavior research that provides useful principles for planning and designing greenways that are both "green" and safe. These principles include: visibility of others, visibility by others, choice and control, solitude without isolation, and environmental awareness and legibility. Design and management considerations include lighting, signs and maps, vegetation management strategies to allow clear sightlines along trails and into adjacent destinations, pathway options and a variety of entrances and exits, policing by City and neighborhood groups, and the location of activity generators.

The mixing of track, street and sidewalk

It is well documented that use of public space tends to lead to more use. A recurring theme in the literature on safety is that increased levels of use contribute to enhanced perceptions of safety in parks. Opportunities to encourage use should be fostered, since activities that draw people are perhaps more important than physical design in enhancing real and perceived safety. The perception of risk must be avoided, since a perceived lack of safety results in decreased use, which in turn can lead to actual risk.

Economic Impacts ~ Pressures on General Fund

Ann Arbor, like most Michigan cities, is experiencing financial pressures. The State of Michigan has reduced revenue sharing to all Michigan cities and the impact of Proposal A and the Headlee amendment results in decreasing property tax revenues. At the same time, healthcare costs for city employees and retirees are rising and the cost of meeting the city's pension obligations is substantial.

In addition to these pressures on the General Fund, the City is facing several unique challenges. The City is required by state law to provide a home for the 15th District Court when it loses

its current lease at the end of 2009, the police are operating out of a substandard facility, and the current City hall is in a deteriorating condition and not ADA compliant. The need for affordable housing continues to grow and its provision remains a community priority.

721 N. Main Street from the air

The City's land has value; property in or adjacent to the downtown is typically of higher dollar value. Sale of these City sites for cash or as part of a public-private venture is a potential source of funds to partially meet the just mentioned financial challenges, including implementing a Greenway's initial improvements.

The combination of rising costs for standard expenditures and the imminent convergence of several critical needs will make the City's General Fund dollars an unlikely source for developing the Greenway. There are, however, potential resources on which the City can draw to fund development of the Greenway. These are outlined in Section 4 and the Appendix.

Financial Benefits of the Greenway

Edge properties to the Allen Creek Greenway could experience a rise in value if the Greenway is viewed as an amenity. Greater density on these fringe properties could result in higher property values, and TIF and property tax revenues.

415 W. Washington and First and William sites

In April 2005, students at the Stephen M. Ross School of Business at the University of Michigan completed a preliminary feasibility study of the Allen Creek Greenway that included a comprehensive financial model (see Supplemental Appendix). They concluded:

> "Our preliminary analysis and financial model suggests that the potential upside of the Greenway exceeds its development cost…. Much of the economic benefit of the Greenway comes from the edge development that occurs over the 30-year period, which results in significant property tax gains for the city."

They also suggested that "if the Greenway [with development of its fringe properties] is not undertaken in a comprehensive fashion, then the realized cash flows may differ greatly from those that are modeled."

Both the National Park Service and the National Recreation and Park Association provide extensive documentation on the economic benefits that parks and open space bring to communities through their impact on residential property values and the property tax base and in their role in attracting new

AARR ROW and Fingerle Lumber yard

residents and businesses, as well as new tourist dollars. A recent New York Times article cited a study by the national Association of Home Builders that found that “Trails are the No. 1 amenity potential homeowners cite when asked what they would like to see in a new community.”

Rising property values and the stimulus to business are not the only potential financial impacts of the Greenway. If changes are designed appropriately to reduce runoff, the community as a whole could benefit by the lower environmental and financial risk of flooding. A study of flood, hurricane, tornado and earthquake natural hazard mitigation activities over the period 1993-2003, undertaken by the independent Multihazard Mitigation Council, found savings of $4 per each dollar invested in mitigation activities, although the study did not isolate either flood mitigation or a watershed equivalent to Allen Creek.

Depending on the recreational opportunities and programming along the length of the Allen Creek Greenway, its use may also generate revenue directly through concessions, and program or event fees. There may even be an opportunity with the sale of branded products.

A key consideration in the decision-making process will be weighing short term versus long term costs and benefits.

Impacts of Growth and Development on the Community

The 2000 U.S. Census listed approximately 2,800 people living within the boundaries of the DDA district in 1,599 housing units. Residential growth is beginning to occur in the CBD; since 2000, 608 new housing units have been constructed, with others recently approved or in the approval process. It is estimated that current development could require about four years to be absorbed.

New and rehabbed buildings

Development fronting onto the Greenway is possible if and when owners of those parcels determine the economic feasibility of improving their sites and move forward with new or enhanced buildings that provide more retail, office and/or residential spaces. There are potential development sites along much of the Greenway. They exist throughout the downtown and along N. Main to the Huron River. There are also pockets of small commercial and light industrial uses along the edge of the railroad. In other areas adjacent to the Greenway lie older established residential neighborhoods, some with historic designations and some with homes located in the floodplain. Any redevelopment of these various sites’ potentials should consider their location in relation to existing neighborhoods.

Changes in Time

The role Allen Creek played in the growth of the City is similar to the roles of most urban streams and rivers. These waters were a source of needed natural resources; a location for transportation; infrastructure for waste disposal; and today, a rainwater utility with problems. As a result of human activity, the creek is a transformed shadow of its former natural self. Subjugation of the creek began over a century and a half ago. Today's discussion about this Greenway is a step in reversing Allen Creek's past, as is occurring for two others in the City, Mallets and Millers Creeks.

721 N. Main, looking in . . .

A community commitment to changing the face and purpose of the Allen Creek valley could be accomplished without eliminating all signs and symbols of its past. Documenting and interpreting the process and direction of change over time presents an opportunity to amend past actions, point to a different direction and, through deliberate steps, implement environmental improvements.

The Greenway can provide both water quality and open space benefits to in-town neighborhoods and a more dense, residentially enriched downtown. The opportunity exists to transform what is currently a place largely without people between the downtown and its adjacent residential neighborhoods into an open space asset. Implementation of the Allen Creek Greenway can help alter the look and feel of Ann Arbor's urban core.

Any development of the Greenway, with the flood fringe as either open space, existing buildings remaining or new buildings constructed, should use and exhibit "green" technology. Criteria for change should also include the charge to communicate, by design, what it means to be a new physical feature in the Allen Creek valley. The design expression of all future improvements should reflect their unique location in this part of our City. The Greenway's program of uses and activities, along with its design form, can combine to help shape the experiences people will enjoy by being there.

Section 3. Recommendations

Allen Creek Greenway ~ Initial and Preliminary Findings
for inclusion in
A2 Downtown Development Strategy
Page 2

Preliminary Principles

1. **Physical elements within the Greenway**
   The Greenway will…
   a. emphasize and follow the Allen Creek floodplain
   b. provide a continuous and barrier-free pathway that integrates with adjacent City sidewalk, street and transportation patterns and public spaces
   c. incorporate the floodway portions of the City owned parcels at First and William, 415 W. Washington and 721 N. Main as destination public spaces within the Greenway
   d. consider the best uses of the floodplain portions of 415 W. Washington and 721 N. Main in the context of complementing and enhancing the Greenway
   e. express the presence of water by incorporating progressive practices to manage rainwater as an asset
   f. incorporate innovative and environmentally friendly runoff water management, and improve water quality and public safety while recognizing its location within the larger Allen Creek watershed
   g. contain year round uses and amenities that will actively populate the Greenway during day and evening hours

2. **Relationship of surrounding neighborhoods and community to the Greenway:**
   The Greenway will…
   a. be a distinct place with a sense of coherence that unites its entirety and provides a fluid sequence of experiences, each considerate of the changing edge conditions
   b. promote partnerships to use public and private land to establish and develop the Greenway and its edges
   c. spur appropriate adjacent economic development including residential, retail, institutional and community-use opportunities that are mutually beneficial to each other and the Greenway
   d. create a safe environment through diverse edge development which fronts onto and places “eyes” on the Greenway
   e. provide connections to other public spaces and community facilities, and to destinations such as downtown, the Huron River Greenway, and the County’s Border to Border Trail

The **Allen Creek Greenway** will take its place alongside the best and most progressive urban spaces.

27 October 2005, authored by the **Allen Creek Greenway Task Force**: Linda Berauer, Jean Carlberg, James D’Amour, Larissa Larsen, Barbara Murphy, Peter Osler, Peter Pollack, Sandi Smith, Margaret Wong

Allen Creek's industrial past

Section 3. Recommendations

The basis for a recommendation is its use of information. To frame a proposal, objective facts can be interpreted and prioritized to evolve, and then validate, a specific outcome. In this instance, a Task Force recommendation becomes an opinion with the potential to physically change our surroundings.

The Task Force reached consensus early in the process by working to recommend a preliminary Vision, Definition and Principles for the Greenway. Excerpts from the Vision statement speak to and about Ann Arbor.

- "Its one-of-a-kind name conjures an image of a delicate intervention within an Arcadian landscape. Eons ago, the glaciers receded and left behind a topography that determined the flow of our rivers and streams. In turn, this physical context influenced its patterns of settlement—the location of its commerce, industry, institutions, neighborhoods, and open spaces.
- As downtown Ann Arbor approaches a denser and taller future, we must strengthen the presence of the natural resources that have played such a critical role in Ann Arbor's history.
- The physical divide that is currently the Allen Creek valley will become a place of destination, circulation, civic gathering, physical activity and repose."

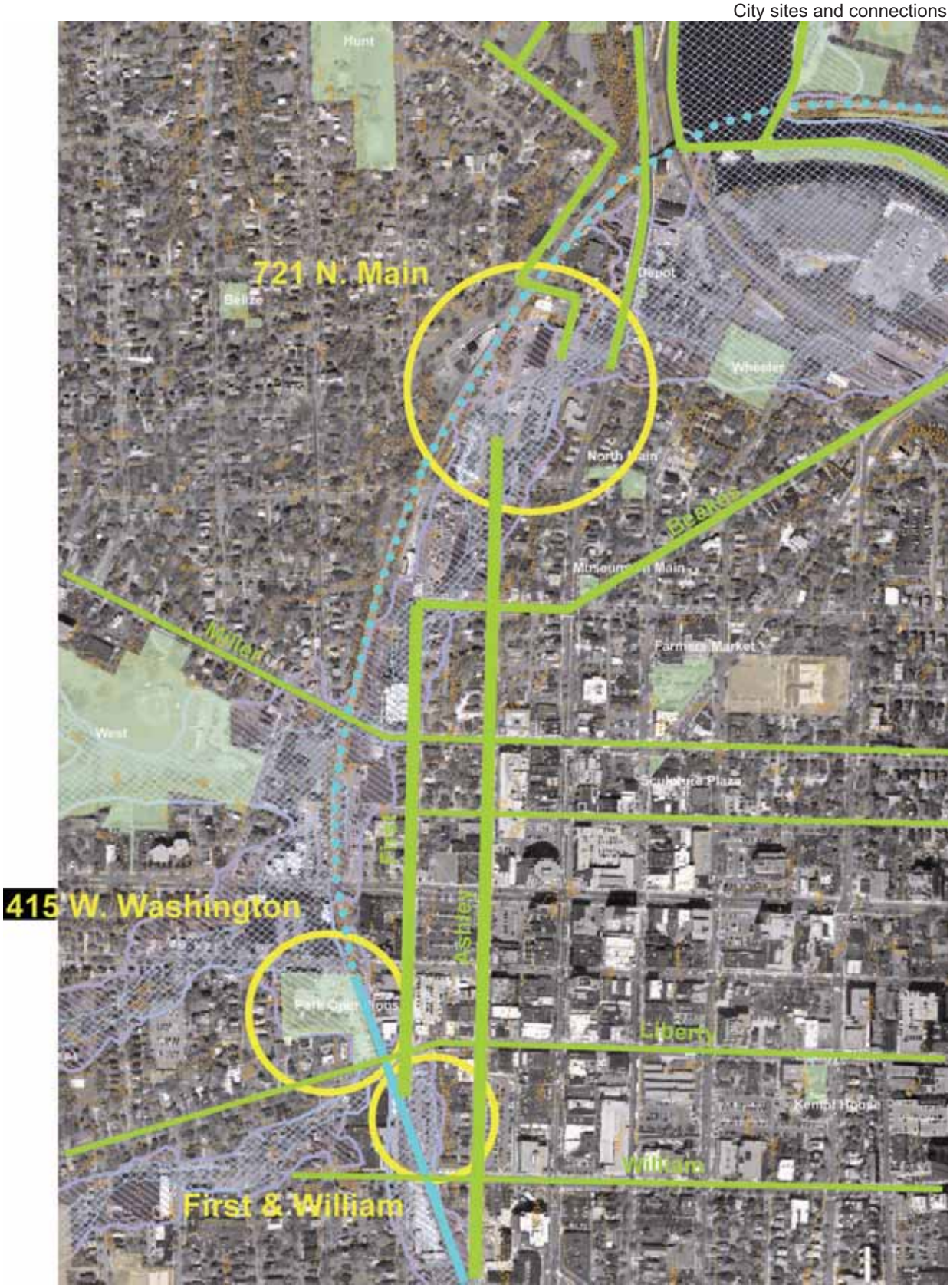
The Task Force's Definition of a future Greenway is

- "a community-wide asset consisting of a sequence of environmentally sensitive open spaces in a City setting; and,
- largely following and relating to the Allen Creek floodplain and its watershed."

Lastly, Planning Principles address the three City-owned parcels included in this study as well as the "relationship of surrounding neighborhoods and community to the Greenway". Both general and site-specific principles are included to guide discussion and decision-making.

The central recommendation of the Task Force builds on City Council's Resolution, and is expressed in the Greenway's Planning Principles. The Task Force recommends that, at a minimum, the Greenway incorporate the floodway portions of the three City-owned parcels at First and William,

City sites and connections



415 W. Washington and 721 N. Main as destination spaces within the Greenway. This primary recommendation leads to a discussion about connectivity, of the linkages between and beyond these three properties.

Connectivity

Incorporating the floodway portion of the three City-owned sites as components of the Allen Creek Greenway is the first step in creating a non-motorized path along the edge of the downtown. The path will connect to the Huron River Greenway and to the Washtenaw County Parks and Recreation Commission's Border-to-Border Trail. Several segments of the Huron River Greenway trail system have been completed; only a few gaps remain within the city. Additional segments between Ann Arbor and Ypsilanti are under construction. Other segments of the Border-to-Border Trail being planned are west of the City along the Huron River. Neighboring municipalities, such as Ypsilanti Township and Pittsfield Township, are developing bike and pedestrian paths connecting with their parks, and linkages from the City to those destinations can be established. The larger network is in the process of becoming a county-wide trail system.

The Border-to-Border Trail

The vision for the Allen Creek Greenway is a path in a continuous, green open space following the floor of the Allen Creek valley along its length and joining the Huron River Greenway. There, pedestrians and bike riders can enjoy a natural setting and cultural amenities and have comfortable travel with the use of the path. In this beginning phase of the development of the Allen Creek Greenway, the floodway of the three City sites could be a destination for nearby neighborhood and downtown residents, workers and visitors.

A well-designed method of identifying the existing sidewalk and street connections between these sites will advertise the evolving Greenway, drawing people to these initial locations. Wayfinding banners and signage, permanently displayed maps at frequent intervals, pavement imprinting and/or coloring, street furniture and unique plantings which all represent the Greenway path will enable pedestrians and bike riders to move easily from one of the three sites to another. A Greenway logo should be a prominent part of wayfinding banners and maps. The maps will identify the Greenway route and nearby park and cultural locations including West Park and other important downtown destinations.

The Bigger Picture

City Streets and Sidewalks

In this beginning phase, the core of the connecting routes for the Allen Creek Greenway is along Ashley and First Sts., with a clearly marked path leading to N. Main St. and, although a bit circuitous, to the Huron River Greenway. At this point in time, a single authorized but unimproved railroad crossing exists at Lake Shore Dr., connecting N. Main St. to the Huron River. The adequacy and number of links across the tracks and connecting to the Huron River Greenway remain problems in search of a solution.

From Non-Motorized Plan

East-west streets which intersect the Allen Creek Greenway, such as Felch, Miller, Washington, Liberty and William, would also have maps indicating routes and locations of both Greenways. These sidewalk routes and on-street bike lanes will need to follow existing traffic signal controlled intersections in high traffic areas.

The City of Ann Arbor Non-Motorized Transportation Plan recommends bike routes in the downtown and throughout the City, which would provide good access to the Allen Creek Greenway from different parts of the city. There is great interest in increasing walking and biking opportunities, and this Greenway would provide both a destination and a path for these activities. Should sites be added to the Greenway, through purchase, donation or easement, connecting routes will possibly change to include new amenities and increase the “way” of the Greenway.

Rails-with-Trails

Looking South from William Street

The long term vision of the Greenway includes a path along the railroad going south from William St. using the Rails-with-Trails concept that has been successfully implemented in Bandemer and Gallup Parks. This could provide a long path from Madison St. to beyond Stadium Boulevard, with few streets to cross. In the first phase of development, no use of the railroad right-of-way as a part of the Greenway’s connectivity could be proposed as talks with the AARR are at a beginning stage. An actual path along the tracks will need to respect the AARR’s concern for safety of pedestrians and bicyclists in proximity to trains. As discussions with the AARR and the U-M continue to seek possible Greenway routes south of downtown, there will be opportunities to increase the number of connecting links.

The AARR north of Liberty is primarily on a berm with trestle bridges crossing above City streets. By law, pedestrians can not access Railroad property. Safety and security concerns will have to be addressed in the design of all Greenway

AARR track at the edge of downtown

improvements and in the choice of additional properties for the Greenway. There should also be continuing conversations with the Railroad around the concept of Rails-with-Trails for this portion of the Allen Creek Greenway, and with Norfolk Southern Railroad to link Allen Creek Greenway and other City parks with the Huron River Greenway and the County's Border-to-Border Trail.

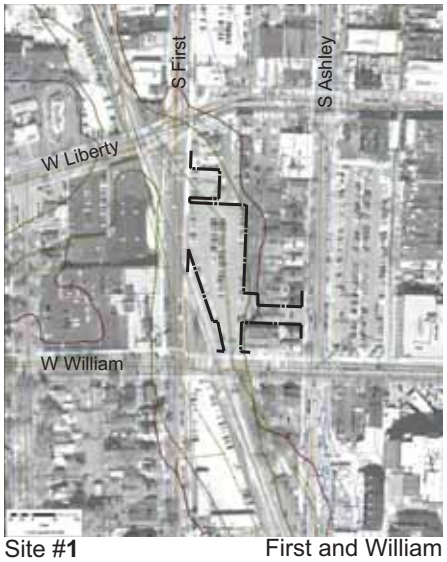
Transportation ~ Commuter Railroad Service

There is great community interest in the possibility of using the north-south AARR rail line for commuters who live outside the City and work here, and to bring visitors into the downtown from other areas. Possible passenger rail stations are suggested for the N. Main and/or the William and First St. City sites in response to this interest.

The north-south rail line is owned by the Ann Arbor Railroad. It is presently used only for shipping freight and does not stop inside City limits. Freight is transferred to Great Lakes Central Railroad which has operating rights for this rail. MDOT owns the track north of Barton Dr. The AARR has not yet expressed interest in allowing passenger service through or into downtown Ann Arbor.

The east-west rail line is owned by Norfolk Southern Railroad, and both freight and Amtrak intercity passenger rail use this line. The Ann Arbor-Detroit Rail Study, with SEMCOG as the planning agency, is examining alternatives for the use of this rail corridor. If a passenger commuter rail option is chosen for this corridor, local transit connections between these two rail lines and employment centers in the City would be needed.

AARR tressle bridge



Site #**1** First and William

Site #**2** 415 W. Washington

Site #**3** 721 N. Main

The Three City-Owned Sites and the Allen Creek Greenway

Greenway use of the three City-owned sites is in addition to initial use of streets and sidewalks in the public rights-of-way for connectivity. The minimum recommendation from the Task Force is that the floodway portion of the three sites be included in the Greenway. The land beyond the floodway, when considered by the Task Force, is where alternative recommendations emerge. As expressions of various priorities for how this location might be treated, the language used to describe the attributes of each alternative should be read as advocating for its particular point of view.

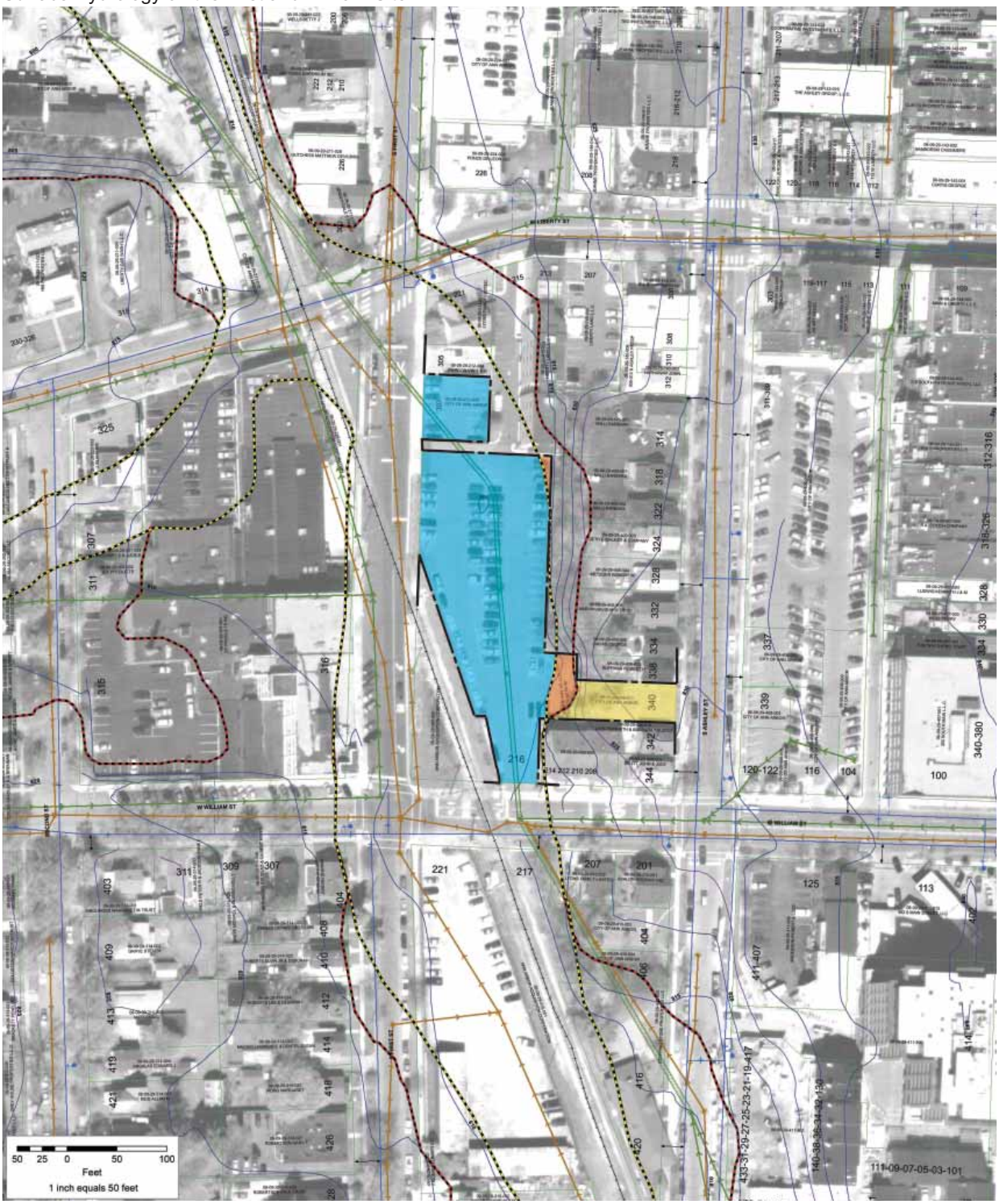
1. **First & William**, Parking Lot
   The Task Force consensus recommendation for First and William is its conversion from parking lot to “urban garden”, with the possibility of including a passenger rail stop, if north-south passenger service is implemented.

2. **415 W. Washington**, City Maintenance Garage
   There are three options for the area beyond the floodway at the City maintenance garage at 415 W. Washington:
   - all open space,
   - re-use of the existing primary building, and
   - new residential buildings and additional open space;

3. **721 N. Main**, City Maintenance Garage
   There are two options for the area beyond the floodway at the City maintenance garage at 721 N. Main:
   - all open space, and
   - new mixed use buildings and additional open space.

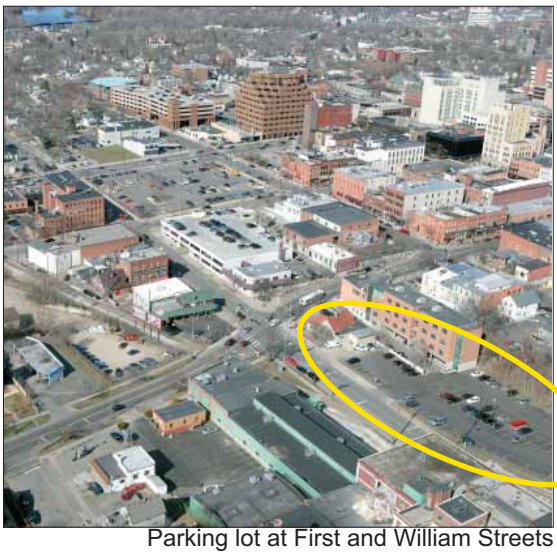
Recommendations and alternatives for the City-owned sites will be presented individually and in the order listed above. Discussion of existing conditions will be followed by descriptions and illustrations of the various alternatives.

Surface Hydrology on the First and William Site



City-Owned Site #1 ~
First and William Streets, Parking Lot

Existing Conditions


Parking lot at First and William Streets

Location: NE corner of First and William Sts., in the DDA/CBD and bordering the OWS historic district. This site is east of the AARR track.

Current Use: A 96 space permit parking lot serving primarily downtown users. After hours (past 6 PM and all day Sunday), the parking lot is available to the general public.

Floodplain and Upland:

The land is divided into:	Acreage	% of total
Floodway	0.85 Ac	85%
Flood Fringe	0.04 Ac	4%
Upland	0.11 Ac	11%
	1.00 Ac	100%

This site is largely in the floodway conveyance zone of the Allen Creek valley's floodplain. Due to the potential risk and liability associated with new or existing buildings in a floodplain, development is controlled by State and Federal laws and required to meet specific regulations.

Allen Creek Drain: The County drain is a large 7'x9' box culvert between 1' and 5' below grade and sitting within a 60' easement controlled by the Drain Commissioner. City staff suggests that the small size of the site could result in the opportunity to employ water quality Best Management Practices (BMP) within catch basins and in rain gardens, and to accommodate first flush on-site rainwater runoff estimated at 635 cubic feet, which translates to an area of 21'x21'x1.5' deep.

Topography: This site has the lowest elevation in vicinity; flat from north to south, and drops 3 feet to a catch basin in the center; approximately 25-foot high hillside on east edge to top of slope of the properties fronting on Ashley. The AARR track is level with First St. and this site.

Vegetation: Adjacent off-site hillside vegetation is largely pioneer and invasive species.

Soils: The site is urban fill, as is the steep slope to the east.

Environmental status: Soil contaminated by arsenic; benzene found in groundwater samples. If asphalt is removed, soil will need remediation.

Adjacent property: North: private offices on Liberty St., and paved alley from Liberty St.; West: 68-unit Liberty Lofts condominiums (Eaton Building) across First St.; East: a rubble fill slope and older residential architecture with mixed commercial and residential uses, and a narrow parcel providing access to/from from Ashley St.; Southeast: town homes on William St.; South: Fingerle Lumber yard, now leased parking across William St. The AARR right-of-way and First St. form the western edge of the site. Additional new residential and mixed-use development planned south, north and east of the site includes Ashley Mews (56 units), Ashley Terrace (93 units), and former City parking structure site at First & Washington Sts.

Notable features: These include the site's openness on its south and west sides where it faces the OWS Historic District, and its single lot connection to Ashley St. on the east. The AARR track and First Street rights-of-way form the property's western edge. The visibility of this property from adjacent public streets will contribute to its presence as a component of the future Greenway. As stated earlier, the Task Force recommendation is use of this 1.0 acre parcel as public open space with a variety of "urban garden" features and activities. Recognition of railroad maintenance activities within its right-of-way will be required.

Parking lot looking South

Floodway

Flood fringe

Upland

Recommendation ~ An Open Space & Greenway Garden

Key Considerations

1. The site is on the edge of the CBD, between the core of downtown and the OWS, and adjacent to the downtown gateway intersection of First and Liberty. Public open space here will serve as an attractive transition and linkage between them.
2. The location of the site is near the liveliest section of the Main St. business district; it is surrounded by a mix of uses (residential, retail, entertainment, office and others) and will provide a diverse set of potential users.
3. The visibility of this property from adjacent public streets will contribute to its presence in the Greenway.
4. The 170 foot length of the AARR track between crossings at William and First will determine the number of passenger cars if this location is to be a commuter rail station.
5. Estimated cost of complete soil remediation to a depth of 20 feet is $3.5 million. Remediation might be phased to accommodate re-use of this site.

Design Intent and Rationale

The location of this site in the floodway, in a transition zone between downtown and the OWS historic neighborhood, and on the edge of the CBD's increasing residential density, led to the Task Force's recommendation. To accomplish multiple objectives and provide community-wide environmental and social benefits, transforming the site into an open space design will

1. manage rainwater and mitigate flood hazard by allowing flow through the conveyance zone to the Huron River;
2. improve water quality by replacing impervious parking lot surface with rain gardens, bioswales or other appropriate methods to filter and cleanse rain water;
3. transform an unsightly transitional zone into an attractive and potentially lively space that links the adjacent residential neighborhood to downtown and functions as a gateway in both directions;
4. provide needed open and civic space in an area of increasing density in the western downtown that can foster increased civic interaction and enhance downtown living;
5. prevent damage to buildings and their occupants by keeping the floodway free of obstructions; and,
6. stimulate edge development and complementary uses

Pros

- Maximizes floodplain flow benefits
- Provides urban garden/open space amenity
- Accommodates rail transit

Cons

- Maximum soil mitigation costs

along Ashley and First Sts. that could result in financial and other benefits to the City.

Parking entry from First Street

The site's potential users include downtown residents, workers, shoppers, and visitors; west side residents; pedestrian and bicycle commuters headed to or from downtown. It should be designed to invite a broad range of activities—planned and spontaneous, active and passive, for individuals and groups.

Active programming, facilitated by good design, is critical to promoting use of the site. Walking groups, morning meet-ups, a tai chi class, sessions of an outdoor chess club, a favored outdoor spot for downtown workers, casual interactions among west side residents and pedestrians, and bicyclists on their way downtown will fulfill the site's potential as a component of the Allen Creek Greenway. The City in addition to neighborhood and community groups can cooperate in this programming.

Program and Design Form

The Open Space design is comprised of four basic elements.

Short Term Parking Lot Reconfiguration ~ **A**

1. **A public open space in the floodway portion of the site.** The primary Greenway path will be incorporated into the overall design, along with lighting, seating, pervious ornamental paving, small and large gathering spaces, temporary and permanent public art installations, signage, and interpretive displays. Ornamental safety fencing will be installed along the railroad right-of-way.

   The contaminated soils on this site will impact planning and require the phased removal of impervious paving for the transformation to landscaped open space. Until the degree and nature of soil and ground water contamination is fully understood, remediation options are yet to be determined. The goal will be eventual full remediation.

   In the short term, the transition from parking lot to Greenway can begin by reconfiguring the layout of the parking spaces and adding ornamental pavement painting or embossing treatments. The small sub-parcel to the north of the main site could be designed as a miniature "woodlot" and rain garden. Over time, additional areas of paving will be removed to create landscaped areas incorporating attractive rainwater quality improvement measures. To maximize the site's ability to capture and clean rainwater runoff, catch basins or catch basin filter systems may be required.

2. **A scenic overlook on Ashley St.** This will provide a view of the floodway immediately below as well as to the

floodway and floodplain at the 415 W. Washington site.

It will contrast strongly with access from the First St. side and will offer an integrated relationship with potential development on the west side of Ashley St. and at the "Kline's" lot. In the very near term, the Ashley St. lot can be developed as a pocket park with educational and informational displays about Allen Creek and the evolving Greenway.

Future development on Ashley St. should be required to provide a friendly face to the Greenway. When development does occur on Ashley St., the pocket park overlook with access to the Greenway below should be retained, either at the present location or at a new location within that block. New development should also accommodate the potential for a rail passenger station at this site by linking the platform with Ashley St.

3. **A pedestrian connection from the overlook on Ashley St. to the Greenway.** Initially this connection could be a simple stairway, to be replaced by a more substantial ornamental stairway and/or elevator as use patterns develop.

4. **Incorporation of the adjacent triangle of land southwest of the railroad track.** This will require an agreement with the AARR to enhance the appearance of this vacant plot to visually tie it to the Greenway open space east of the track. Accommodation of both railroad maintenance activities within its right-of-way and the safe public use of the adjacent Greenway will be required. The City should also complete the sidewalk along First St.

AARR track crossing First Street

If a commuter train service is established along the AARR track, a covered open platform could be located along the track at the southwest corner of the site.

Ownership of the other triangular parcel on the west side of First St. near Liberty St. and adjacent to the new Liberty Lofts retail spaces should be determined. There is potential for this parcel to be visually tied to the Greenway both at First and William and at 415 W. Washington, and this possibility should be pursued.

Implementation Time Line

Phase 1 (immediate and concurrent with parking lot use)

- The site is public property; there is no acquisition cost. Dedicate site to the City park system with a joint operating agreement between Parks and DDA with parking retained

Short Term Parking Lot Reconfiguration ~ **B**

for seven years or until no longer required, whichever comes first.

- Park Advisory Commission, Recreation Advisory Commission, City staff, neighborhood associations and community groups develop programs to establish the site as a locus of activity (initially on Sundays when permit parking is not enforced).
- Develop Ashley St. pocket park and "scenic overlook."
- Develop and install interpretive signage and educational displays to raise awareness of the site's history and its place in the Allen Creek Greenway and broader non-motorized trail network.
- Determine type and degree of soil contamination and develop appropriate remediation plan.
- Develop and implement first step landscaping, parking reconfiguration and soil remediation plan.
- Implement ornamental pavement (painting or embossing) to indicate Allen Creek and the Greenway.
- Continue discussions with AARR including enhanced treatment of railroad right-of-way.

Phase 2 (when site is no longer used as a parking lot)

- Install initial greenway path.
- Continue remediation.
- Implement landscape elements (appropriate to level of remediation) such as rain gardens and other features.
- Continue programming efforts to develop Greenway uses.

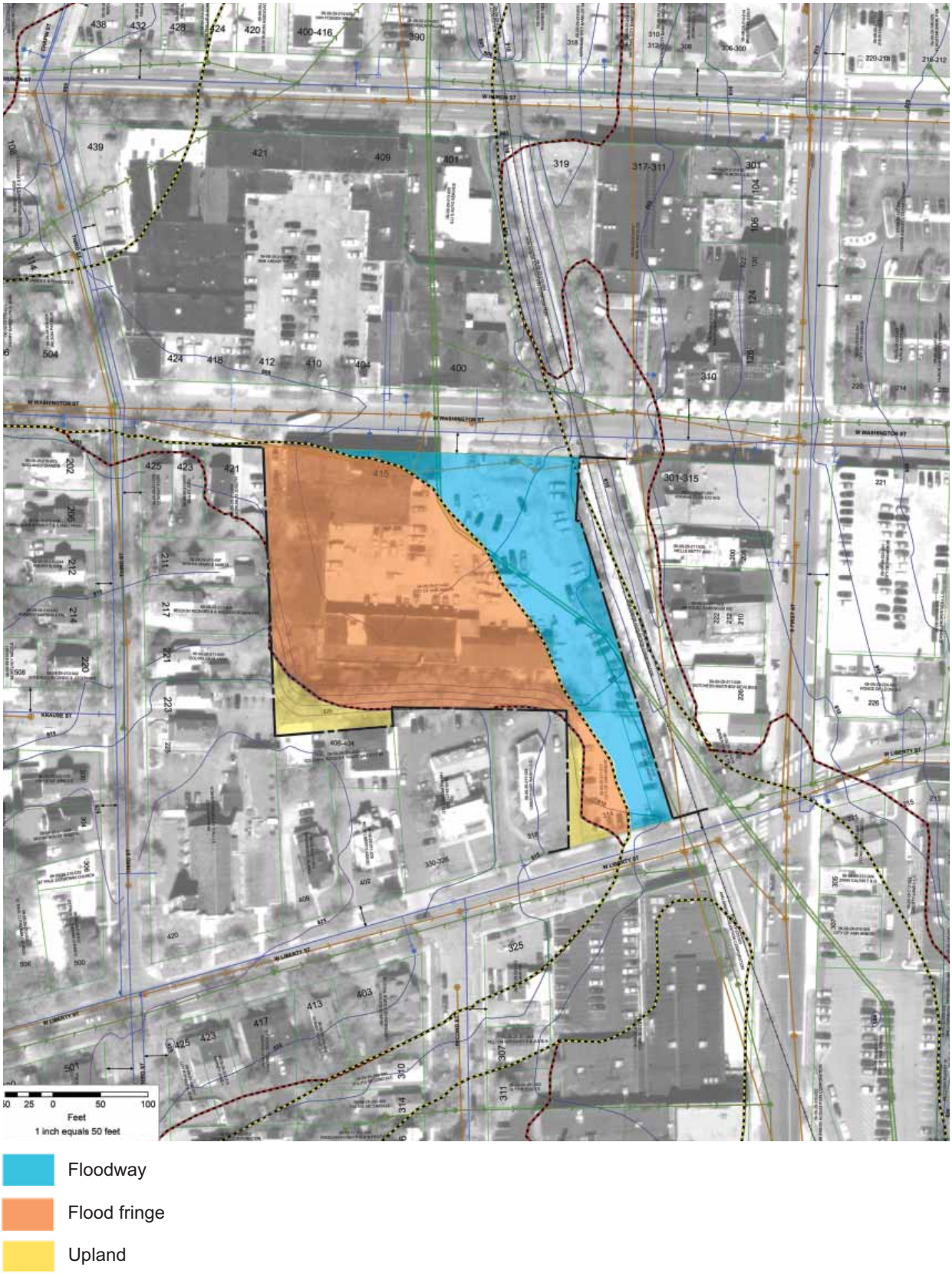
Phase 3 (long term)

- Complete remediation and landscape features.
- Install greenway path(s) and other improvements.
- Continue programming efforts to develop/sustain Greenway uses and site specific uses.

Summary

The Task Force's recommendation for use of this one acre, largely floodway, parcel is permanent open space and part of the larger Allen Creek Greenway. Reasons include its location, its floodway characteristics, and its potential value as an open space when thinking about the City center holistically. Conversion of this surface lot to Greenway garden is an important early step in creating a visible open space destination, stimulating adjacent private property improvements, and positively altering the character of this part of the City.

Surface Hydrology on the 415 W. Washington Site



City offices and maintenance lot on Washington

City-Owned Site #2 ~
415 W. Washington, City Maintenance Garage

Existing Conditions

Location: South side of W. Washington St., between First and Third Sts.; in the OWS Historic District and the DDA District; adjacent to the CBD.

Current use: City-owned fleet maintenance and office facility; main building used as office space by City Parks staff. City plans to relocate its functions from the site by fall 2007.

Floodplain and Upland

The land is divided into:	Acreage	% of total
Floodway	0.81 Ac	32.4%
Flood Fringe	1.53 Ac	61.2%
Upland	0.16 Ac	6.4%
	2.50 Ac	100%

This site is in the floodplain conveyance zone of the Allen Creek valley. Due to the potential risk and liability associated with new or existing buildings in a floodplain, development is controlled by State and Federal laws and required to meet specific regulations.

Allen Creek Drain: The drain enters the site at its eastern edge, approximately one-third of the way into the site from the south, and is contained within the floodway zone. The County drain is a large 7'x9' box culvert between 1' and 3' below grade and sitting within a 60' easement controlled by the Drain Commissioner. This site can accommodate rainwater quality BMPs within the flood fringe and, potentially, first flush and runoff storage of 12,255 cubic feet, or 90'x90'x1.5' deep.

Topography: The railroad embankment lies at the eastern boundary, approximately 12-feet high at Washington St. and falling to ground level at Liberty St.; approximately 25-foot high steep slopes at portions of south and west boundaries; grading generally slopes down to a relatively flat central area that is the lowest point with a largely consistent elevation along Washington St. In effect, the site is bounded by sloping edges on the east, south and west. A narrow strip of the parcel fronts onto Liberty St. and provides a continuous link north to Washington St.

Vegetation: Plant material on site is minimal; what does exist are pioneer and invasive species.

Soils: The site is disturbed urban fill soils.

Environmental status: Past contamination by leaking underground gasoline storage tanks has been remediated and tanks removed; contaminate concentrations are significantly reduced but levels are not below residential cleanup standards, site has not reached closure; ongoing contaminate source may be off-site, additional investigation and possible remediation may be needed if site is to be reused.

Existing buildings: The site contains several aged buildings; the Washington St. building is the most substantial; its redevelopment viability and the cost to bring it up to building code compliance are unknown.

AARR tracks looking North to the embankment

Adjacent property uses: North: YMCA across Washington St.; Northeast: Ashley Terrace (93 units proposed) across Huron St. at First St.; East: AARR right-of-way with office/commercial east of the future mixed-use project at First and Washington Sts. including residential units; South: possible commercial properties and 68-unit Liberty Lofts condominiums (Eaton Building) across Liberty St.; West: older residential dwellings and church; the OWS Historic District to the south and west.

Notable features: The site's built conditions, primarily the architecture, by nature of being within the OWS Historic District, require Historic District Commission approval of any proposed building modifications or removals; and, the Liberty St. frontage and elevation, along with the openness of the railroad right-of-way looking south from Liberty St., put 415 W. Washington site in visual contact with the First and William Greenway site. Their proximity to each other and to the Liberty St. corridor could provide for visual and physical connections beyond this site's property lines. Lastly, the success of the adjacent YMCA suggests consideration be given to its activities and this site's redevelopment program.

Looking Northeast to Washington Street

Floodway

Flood fringe

Upland

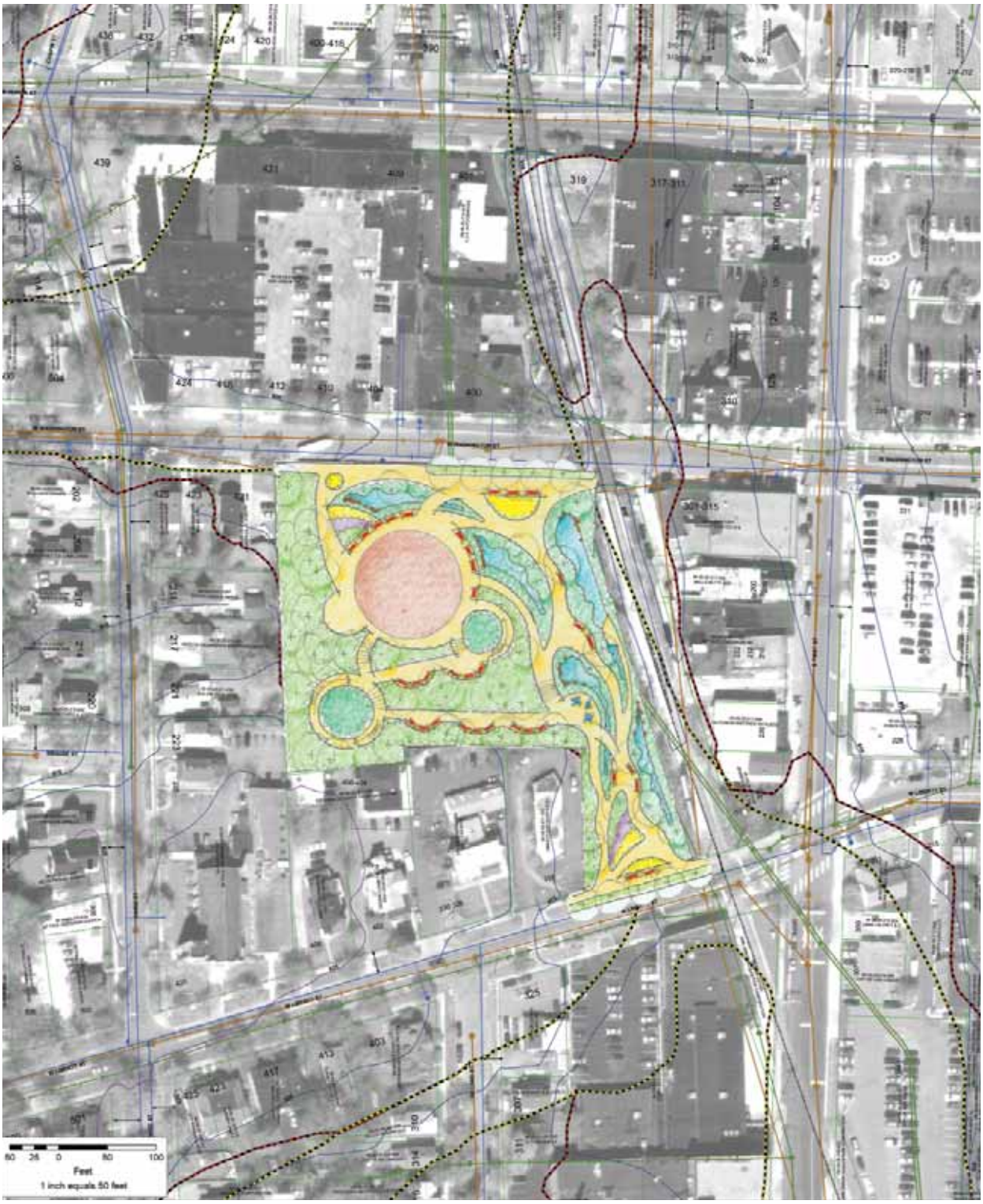
Alternative A ~
Greenway Art and Performance Park

This option accepts that responsible public policy does not allow new building construction in a floodplain. The City of Ann Arbor should set an example for ethical land use on property it controls.

Because of its setting between the heart of downtown and vibrant residential neighborhoods, this site is an ideal location to promote Ann Arbor's collective social and cultural life. Ann Arbor's core identity has long sprung from its cultural institutions, ranging from the thoroughly respectable to the wildly alternative. The community abounds with artists, arts advocacy groups, cultural organizations and institutions, patrons of the arts and committed art lovers. They are an important source of our reputation as a home for the uncommon, diverse, world class and cutting edge. Diversified and unusual venues for showcasing the arts enhance this identity. These are the motivations driving this proposal for a Greenway Art and Performance Park at 415 W. Washington.

Key Considerations

1. The current building fronting on Washington St. is a significant obstruction in the floodplain according to City of Ann Arbor staff.
2. There are viable underutilized developable sites that are outside the floodplain within a few blocks of the parcel.
3. The 1988 Ann Arbor Downtown Plan recognized this area as both interface and "natural buffer" between downtown and nearby neighborhoods and noted the "special topographic feature" of the Allen Creek valley for creating "improved entries to downtown" and "[enhancing] downtown's unique identity as a place".
4. Near the liveliest section of the Main St. business district, and immediately surrounded by a mix of uses (residential, retail, entertainment, recreational, office and others), this site will attract a diverse set of potential users.
5. The new YMCA has greatly increased activity and traffic in this area throughout the day and into the evening, during the week and on weekends.
6. The site's Liberty St. frontage and elevation, with the openness of the railroad right-of-way, puts it in visual contact with the First and William site. In turn, the visibility of this property from First and William emphasizes the continuous nature of the Allen Creek Greenway.



Pros

- Maximum open space for flexible public use
- Building removal maximizes floodplain flow

Cons

- All public investment; no economic gain

Design Intent and Rationale

This location, almost entirely within the floodplain, in the center of the transition zone between downtown and a historical neighborhood, and at the edge of an area of increasing residential density, drives our recommendation that this site be an open space park and open air art and performance venue. To accomplish multiple objectives and provide significant community-wide environmental, economic and social benefits, an open space design will

1. create unique destination space dedicated to supporting and showcasing the arts community, a key element of Ann Arbor's quality of life and identity as a vital, successful city;
2. manage rainwater and mitigate flood hazard by allowing flow through the conveyance zone to the Huron River;
3. prevent damage to buildings and their occupants by keeping the floodplain free of obstructions;
4. improve water quality by replacing impervious surface with rain gardens, bioswales and other appropriate methods to filter and cleanse rainwater;
5. transform an underused "no access" zone into an attractive and lively destination, designed to create community activity and promote non-motorized transportation;
6. maximize the physical extent and the visual and experiential impact of open space in the heart of the Greenway; and,
7. stimulate new edge development and complementary uses to the north, east and south of the site that will result in financial and other benefits to the City.

View South to Liberty Street

Committed and imaginative programming of regular events and special activities at this location is a crucial component of this proposal. This will require innovative partnerships between the City, non-profit and civic organizations, schools, other community institutions and private sponsors. The diverse and ever changing nature of what will appear in this public open air gallery and performance space will keep residents and visitors interested and prompt return visits. Such an unusual and visible venue for Ann Arbor's art and culture community so close to Downtown will become a key Greenway destination.

Program and Design Form

The Open Space Scheme removes all existing structures from the site, and is comprised of three basic elements.

View North to the YMCA

1. **A Greenway garden in the floodway portion of the site.** This garden will combine pervious ornamental paving with native plant rain garden “basins” to clean rainwater runoff. The east side of the site connects Liberty and Washington Sts. The primary Greenway path will be incorporated into this area, with lighting, seating, public art, signage and interpretive displays. The Liberty St. entrance will be a highly visible gateway. Connection to the First and William site will be emphasized by ornamental pavement treatments such as applied color, contrasting materials, and pavement embossing. Possible residual site contamination, if any, will be coordinated with removal of impervious paving and landscaping installation.
2. **A community Art Park in the main portion of the flood fringe area.** The Art Park will be a flexible venue for a changing schedule of public art work. This can include temporary art installations, performance art, small scale concerts and “low tech” theatrical performances. Landscaped areas, lighting and seating will be combined with an open, pervious surface performance plaza. Instead of any permanent structure, anchor connections can be embedded in the plaza to permit installation of temporary tent covering or light shelter as needed.
3. **A handicapped-accessible path that branches off from the Liberty St. entrance and runs along the south edge of the site.** To provide safe and universal access to and through this site, a ramp is necessary. City staff notes that a few feet of soil could be removed from most of this site, lowering the grade on the southern portion that extends to Liberty St. to improve the flood flow thorough a constricted area. Modification of site grading and rain garden excavation should also be calculated to facilitate the ramp design. The ramp should be designed to function as or incorporate informal seating.

Implementation Time Line

Phase 1 (short term)

- Site is public property and has no acquisition cost.
- Seek Historic District Commission approval to demolish all buildings and structures.
- Develop landscape design, including determination of type and degree of soil contamination, appropriate remediation plan and re-grading scheme.
- Initial phase installation of the floodway garden, Art Plaza and paths.

- Develop programming to establish a regular schedule of Greenway Art Park uses and events. Seek partnerships with the City, non-profit and civic organizations, schools, other community institutions and private sponsors.
- Develop private, public and non-profit funding sources for arts programming.
- Begin discussion with AARR to plan enhanced landscaping of railroad right-of-way, including small triangular plot at southwest corner of Liberty and First intersection.
- Implement ornamental pavement (painting or embossing) to indicate Allen Creek and suggest the Greenway across the Liberty and First intersection to link to the First and William.

Phase 2 (medium term)

- Continue installation of floodway garden, Art Plaza and paths.
- Install ramp.
- Continue to develop programming of Greenway Art Park and private, public and non-profit funding sources for arts programming.

Phase 3 (long term)

- Finish installation of complete design.
- Consider what modifications will be needed to work best with changes in immediate vicinity (completed Liberty Lofts commercial area, changes at “Brown Block”, changes in commercial uses along south boundary, etc.).
- Continue to develop programming and funding sources.

Summary

This site has tremendous potential to strengthen our community’s collective quality of place and quality of life as a public space that enhances everyday experience. A city with an active, varied, innovative and well-supported arts and culture scene is an exciting and competitive city that will draw residents, visitors, businesses and investment. This provides strong support for the viability of the “place making” goals of this design. Selling this publicly-owned floodplain parcel for short term gain would be an irreparable loss. The psychological, social and economic benefits of green “real places” dedicated to community activity in the midst of where people live and work are incalculable.

View to the Southwest

Pros

- Architectural history preserved with adaptive reuse
- Known building mass/volume
- Minimum disturbance during construction

Cons

- Viability of existing buildings
- Economics ~ is rehab financially sound?
- Existing floodplain obstructions

Floodway

Flood fringe

Upland

Washington Street historic structure

Alternative B ~ Retain Current Structure ~ Community Building

The site at 415 W. Washington is in the OWS Historic District; the primary building may have historic significance. For this reason alone, there may be an argument that the building should remain in place. Another rationale for maintaining the current structure has been provided by a variety of artists, artist organizations and other non-profit entities such as Kiwanis, many of which have expressed a desire to maintain the building for use by their respective organizations. There was significant participation by the arts community at the public comment section of our Task Force meetings, the Public Process meetings held by the Task Force, as well as written communications to the Task Force. The Arts Alliance states that the City of Ann Arbor "provides surprisingly little support for its artists and cultural organizations… A community cultural facility has the potential to positively impact downtown Ann Arbor. Similar facilities (renovated warehouses, factories, etc.) have spurred economic vitality in a number of ways."

Design Intent and Rationale

With this strong public sentiment that the buildings retain value to the community, the Task Force has included an option that retains the current structure on the site. Only a small corner of the existing Washington St. building is in the currently delineated floodway.

The City should hire a structural engineer to determine the condition of the current building and the cost to rehab it. If the report indicates that the building is structurally sound, the report should be made available to any interested organization.

The City could either lease the property for a nominal fee or sell the property at full market value. In all cases, the property should be bound with a deed restriction that calls for the floodway portion of the site to forever be maintained as a public greenway.

Program and Design Form

Because there are multiple organizations that have shown interest in this site, the City should issue an RFP to non-profit organizations. The following criteria should be used to evaluate the proposals:

1. Must show how the re-use plans and design form for building and site express this location in both the Allen Creek valley and the Greenway, and a design which will

Second floor corridor

Interior of main garage

facilitate use of the floodway for paths, sitting areas and appropriate plantings.

2. Must show a development and maintenance plan, including financials, for the floodway as a permanent public greenway which include water quality BMPs such as rain gardens and bioswales, and contains the volume required to control first flush rainfall runoff from within the site.
3. Must demonstrate and quantify rainwater runoff improvements and benefits with the site re-use.
4. Must demonstrate activation of the area and how the presence of the organization provides for “eyes on the park.”
5. Must demonstrate clear community benefit to the greatest extent possible, including quantifiable measures of the number of people using the site, the number of hours a week the site is activated as well as the financial return and economic benefits to the City.
6. Should demonstrate synergy with the YMCA and the downtown.

Summary

The City can satisfy numerous community goals by electing to allow the current structure to remain in place at this site. The exterior facade can be restored using historic guidelines, maintaining the values of the historic district. The arts community could have a facility that will act as the cultural center for many different organizations. This publicly owned property would remain in the public domain. The western edge of the downtown will be activated, enhancing the area and contributing to a vibrant and exciting urban core. Perhaps most importantly, a segment of the Allen Creek Greenway will be created, maintained and supplied with a ready audience of participants.

View looking Southwest from Washington Street

Floodway

Flood fringe

Upland

Alternate C ~ New Housing and Additional Open Space

The inclusion of this site in the DDA District is the result of a view offered in the initial 1982 DDA Plan, that a City maintenance garage at this location was not likely to be the long term and final use of the property.

Key Considerations

This 2½ acre parcel is possible to describe as limited in its presence, direct influence and impact on Ann Arbor's CBD. Located to the west of a railroad embankment, the site is physically, if not placed by one's perception of it, more into the OWS residential neighborhood than within the dynamics of the City's downtown. Reinforcing this mindset is a history of the City's planning documents dating to the early and mid-1970s expressing caution about the tendency to expand downtown's activities into the Central Area's close-in residential neighborhoods.

Committing the site's floodway as a core component of the Allen Creek Greenway, and using approximately 1.30 acres of the available 1.69 acres of flood fringe and upland for building new housing, result in a site that is almost equal in area for new residential architecture and expanded open space. The Greenway allocation grows from the 0.81 acre floodway to 1.2 acres of paths and gardens, or almost half the total site.

Design Intent and Rationale

The addition of both housing and open space at this location should result in

1. adding new residents in close proximity to the downtown while placing them in the desirable OWS residential atmosphere;
2. taking advantage of the Greenway's potential for adjacent property value increase and development opportunities on the City's site resulting in less impact on the dominant and more pure single family character a short distance to the south of Liberty and west of Third St.;
3. introducing housing and open space into the block provides for additional eyes on the Greenway without affecting the YMCA's pattern and timing of activities, since housing typically moves on a different and complementary schedule;
4. stabilizing the mixed use character of adjacent properties

Pros

- Potential for City revenues and use of Brownfield funds
- Affordable housing opportunity
- Provides “eyes”
- Improves floodplain flow

Cons

- Risk of living within/above floodplain boundary
- Parking on the ground floor

fronting on Liberty St., and leading them toward a higher quality outcome more consistent with the architectural and site/landscape characteristics of Liberty Lofts, St. Paul Evangelical Lutheran Church, and the YMCA; and,

5. using the development value of the property for Brownfield funding, Greenway construction and open space maintenance over time. The possibility exists to improve the area beyond the site's legal boundary, i.e., to use the financial potential of this site to help fund the First and William site's conversion to Greenway.

Program and Design Form

Looking South into the maintenance yard

The characteristics of the approximately 1.2 acre open space should be consistent with the intent previously expressed by the Task Force's consensus recommendation for program and design form of First and William: open space uses and activities placed into the land in patterns that invite and then shape experience.

1. **Program within Floodway**

An urban garden and open space with a network of paths for recreation; rain gardens for water quality improvement; and areas for sitting, gathering and flexible activities and exhibits are among the possibilities.

2. **Program beyond the Floodway**

The potential is for residential uses above with parking below, on ground level and contained within the building footprint. Also to be considered are common spaces within the housing and outside on-site, the latter being open space on-grade, and with green roof treatments at plaza and rooftop levels.

More specifically, the intent of the design guidelines illustrated by the concept for this alternative includes

1. stream-like, meandering lines of movement as pathways, rain gardens, activity areas and other rainwater BMPs, all using forms mimicking the flow of water;
2. form and layout of buildings and site integrate with and respond to the Allen Creek Greenway's open space on-site, and linked to off-site connections;
3. building and site design that meets or exceeds Federal, State and local floodplain laws and requirements;
4. links between ground level and upper residential plaza levels for circulation/movement as well as light and air flow;
5. references to architectural past, including the possibility of "deconstructing" the Washington St. facade so as to retain

its structural elements while placing new architecture to the south, set back from the original building remnant;

6. green building requirements including little to no rain-water runoff;
7. sequence of spaces from public to semi-pubic to semi-private to private;
8. buildings that encourage use of the Greenway and express interaction; and,
9. design expression that addresses its location yet looks past the site's property lines.

Implementation Time Line

Phase 1 (short term)

- Upon completion of the City move to the new garage in fall of 2007, relocate site perimeter fencing to secure the building complex and open passageway from Liberty to Washington, making modest improvements to the paved surface to facilitate safe travel.
- Discuss and finalize the approach to use of Brownfield funding to remove remaining soil contaminants on this and First and William sites.
- Discuss and finalize the residential program for overall number of units including percentages of affordable, work force and market rate housing.
- Discuss and develop metrics for financing, developer maintenance of the adjacent Greenway, relationship of housing to the Greenway and the general vicinity, and revenue generation.
- Develop an RFP for a public-private partnership to move forward with planning, design and implementation of the Greenway and new housing proposal.

Phase 2 (medium term)

- Issue the RFP, evaluate responses based on accessing Brownfield funds, housing program, Greenway implementation, and other factors identified during the RFP process, and select the most advantageous proposal.
- Developer to proceed with design, seek required City, County and State approvals prior to proceeding with construction.
- Implement Greenway and housing consistent with plan and permits as approved.

Phase 3 (long term)

- Initiate agreement between City and housing association to

monitor, manage and maintain the Greenway and housing's adjacent open space.

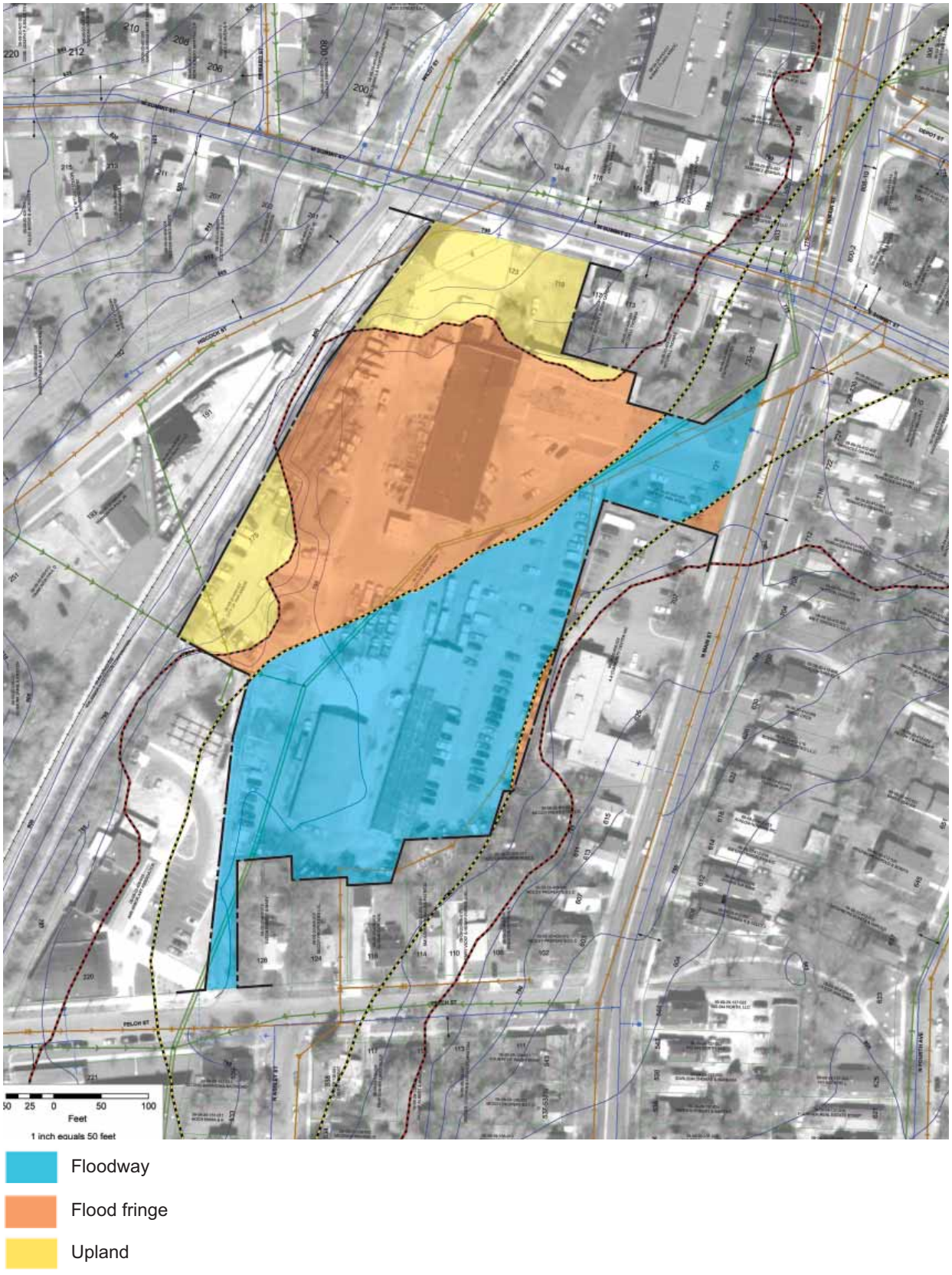
- Jointly monitor rainwater runoff BMPs for any needed changes.
- Jointly monitor and adjust programming of the Greenway's open spaces if/as needed.

Summary

Selection of this alternative to use 415 W. Washington to both expand the Greenway beyond the floodway and provide a variety of housing types takes advantage of the site's location, the potential for the City to gain financially, and to possibly rely on a public-private partnership to develop and care for this section of the Allen Creek Greenway. This alternative adds new residents in close proximity to the downtown without pressuring the integrity of the OWS Historic District or conflicting with activities at the YMCA. Financial gains from private development can be integrated into the broader picture of soil contamination and remediation on all three of the City-owned sites as the Greenway is developed. The adjacency of 415 W. Washington to First and William site, being literally across from each other on the north and south sides of Liberty St., suggests concurrent implementation if at all possible. Sharing the W. Washington's 2.5 acre site for both public open space and private mixed unit housing makes the potential of joint construction more likely.

Looking North across Liberty Street

Surface Hydrology on the 721 N. Main Site



721 N. Main in context

City-Owned Site #3 ~
721 N. Main, City Maintenance Garage

Existing Conditions

Location: West side of N. Main St., between Felch St. (to the south) and W. Summit St. (to the north).

Current use: City-owned fleet services yard. City plans to relocate its functions from the site by fall 2007.

Floodplain and Upland

The land is divided into:	Acreage	% of total
Floodway	2.44 Ac	47.9%
Flood Fringe	1.96 Ac	38.4%
Upland	0.70 Ac	13.6%
	5.10 Ac	100.0%

This site is in the floodplain conveyance zone of the Allen Creek valley. Due to the potential risk and liability associated with new or existing buildings in a floodplain, development is controlled by State and Federal laws and required to meet specific regulations.

Allen Creek Drain: Drain enters at narrow southern Felch St. frontage and roughly follows west floodway boundary largely within the floodway zone, exits the site at N. Main St.; top of the drain is approximately 2 feet below ground level. The Office of the County Drain Commissioner will not permit building directly over the drain and requires a 60-foot wide easement centered on the drain; any development cannot impede access to or the functioning of the drain.

Topography: Site is partially bounded by the 20-foot high AARR embankment to the west and a 20-foot high slope to the north at W. Summit St.; interior of the site is largely flat, with 2 feet of fall between Felch St. on the south to N. Main St. on the northeast.

Vegetation: Plant material on site is minimal; here, too, what does exist includes pioneer and invasive species.

Soils: The site is disturbed urban fill soils.

Environmental status: Site has been remediated and meets the standard for unrestricted residential use.

Existing buildings: Site contains four primary garage and warehouse-like structures; all are in the floodplain, as are

Ann Arbor Art Center

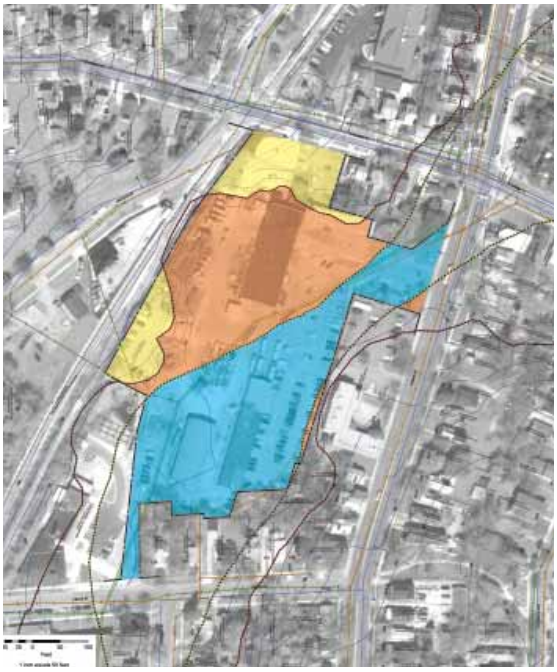
Ann Arbor Community Center

several other small multi-purpose storage sheds. Existing buildings are in poor condition as judged by City staff; the buildings are assumed to be non-Code compliant; and, the cost to renovate any of these buildings for legal occupancy and Code-compliance is currently unknown. City staff says removing these structures would improve the floodplain management in this location. Pavements are either hard packed gravel or asphalt, and impervious.

Adjacent property uses: AARR's right-of-way to the west, both sides of the track, are used for operations and maintenance purposes and forms the northern portion of the western boundary; the Ann Arbor Art Center offices and classroom building are to the west; the Ann Arbor Community Center building and parking lot is to the east; the Beal Construction offices and studio complex are south across Felch St.; individual residential properties are located to the south, southeast and northeast; the SBF single family neighborhood is to the west; and the NCPOA is east of Main St.

Notable features: The site's size, its location close to the Huron River, and its frontage on Main St. suggests opportunities that are different from the other two City-owned sites. An opportunity exists for coordination with future development and renovation plans of both the Ann Arbor Community Center and the Ann Arbor Art Center. While access north to the Huron River Greenway is currently complex with the only official railroad crossing being at Lake Shore Dr., the Greenway access route south toward City-owned sites 1 & 2 can occur along Ashley and First. This site's connection to W. Summit St. can provide access to property owned by the Elks who have graciously allowed entry onto their land and into Bluffs Park. Such cooperation might be continued more formally as the Elks property is currently undergoing redesign.

Main Street frontage



Floodway

Flood fringe

Upland

Alternative A ~
Open Space Design: Community Green

Ann Arbor has a reputation for environmental stewardship and a growing commitment to sustainable practices. This site offers the City a unique opportunity to put this commitment into practice by preserving this large floodplain parcel in its entirety as Greenway open space.

> "We have reached the point where we need to think about what kind of environmental future we're going to have. I believe we can live in harmony with our environment; we don't have to go out there and pave every square inch. But we need a new ethic for living in our world."
> *-Chuck Flink, founder of Greenways Incorporated, as quoted in Greenways for America, Charles Little, 1990*

Key Considerations

1. Because of its size and location so near the Huron River, it is especially important to optimize the hydrological functioning of this floodplain area. River water quality will benefit directly.
2. New construction in the floodplain is poor public policy. The City, as the steward of the public good, should set an example for ethical land use.
3. The site is adjacent to the intersection of West Summit and N. Main streets, a primary "gateway" to Ann Arbor and Downtown from interstate highways. This is an area long considered in need of substantial improvement to create a distinctive and attractive entry to the city.
4. The site offers the potential of forming a green bridge between the city and the parks and trails along the Huron River.
5. The site is located directly between established single-family neighborhoods and a portion of N. Main St. poised for significant new development, as indicated by parcel consolidation shown on property tax records. Public green open space can serve both areas, and function as an attractive transition and linkage between them, as anticipated in the 1988 Ann Arbor Downtown Plan.
6. The site is surrounded by a mix of uses within a two-block radius: single family residential, non-profit, arts, community, retail, commercial and office, thus providing a diverse set of potential users.

Pros

- Diverse recreation potential
- Building removal/deconstruction improves floodplain flow
- Water quality benefits
- Interprets site history

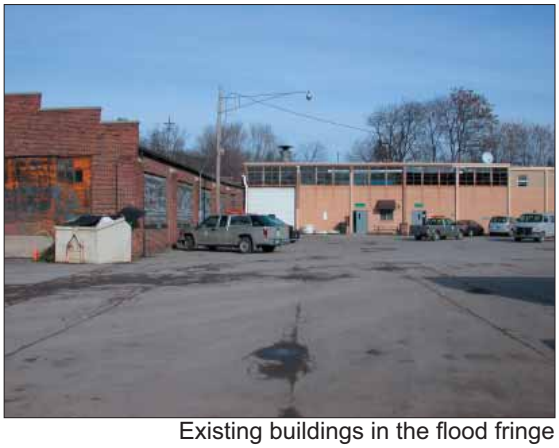
Cons

- Isolated, lacks “eyes”
- All public investment; no economic gain
- Lacks rail & bus transit facilities

7. The site's size and relative separation from its larger residential neighborhood surroundings offer opportunities that are different from those possible on the other two City-owned sites.

Design Intent and Rationale

The large size of this site, and its location at a gateway to the city, in a transition zone between established neighborhoods and an area that is moving towards increased development, drives our recommendation for total open space use.


Existing buildings in the flood fringe

To achieve important objectives and provide a variety of community-wide benefits, an open space design will

1. create a welcoming gateway on a major access route to Ann Arbor and provide connectivity for non-motorized transportation;
2. provide opportunities for active recreation only a few blocks from downtown and lacking elsewhere in the City;
3. manage rainwater and mitigate flood hazard by allowing flow through the conveyance zone to the Huron River;
3. improve water quality by replacing impervious surface with rain gardens and bioswales planted with appropriate vegetation to capture, filter and cleanse rainwater;
4. preserve public safety by not putting work places or residences in a location that is hazardous in the event of a flood;
5. transform a "no access" zone into a lively, green open space dedicated to improving the health and well being of residents and providing a venue for communal public activities; and,
6. stimulate new edge development and complementary uses along Main St. that will result in financial and other benefits.

Incorporating this site commits to the generous vision of the Greenway that Ann Arbor deserves. Its size will permit more creative approaches to water quality management, as well as make it suited to active recreation programming. Its proximity to the Ann Arbor Art Center, the Ann Arbor Community Center and the Dance Gallery Foundation provides an opportunity for coordination of arts and civic programming. The combination of uses and activities will evolve over time if options for future use are not limited.

Program and Design Form

The Open Space design removes existing buildings at the north

end of the site and retains the two frame structures at the south half for adaptive re-use. It is comprised of two basic elements:

1. **Interpretive Creekshed Garden.** This garden, incorporating the entire floodway, will combine pervious ornamental paving, soft surface paths and boardwalks with a showcase system of native plant rain gardens and other innovative means to cleanse rainwater runoff. The functional aspects of this garden, as well as the history and importance of the Allen Creek watershed, will be articulated through interpretive displays and signage. Opportunities for water-based recreation should be considered, for example a shallow splash pool that converts to an open-air skating pond in the winter. Two existing buildings could be deconstructed to become pavilions. The primary Greenway path, with coordinated lighting and seating, will connect Felch St. to N. Main St. and will be incorporated along and into this major garden area.

   Site entrances at N. Main and Felch St. should be highly visible and ceremonial. Currently the Felch St. access has a narrow frontage, but is adjacent to a parking lot owned by the Ann Arbor Art Center. The City should investigate a cooperative arrangement with AAAC to develop the Felch St. entrance.

Looking North from Felch Street

2. **A Community Green.** A small amphitheater could be incorporated at the high end of the site at W. Summit St. providing a panoramic view. The grade change may also make portions of the parcel ideal for a skateboard park. Community gardens might be planted in raised beds in the flood fringe conditional upon compensatory excavation in the floodway. The flood fringe might also accommodate a fenced dog park. Existing pieces of “industrial archaeology” such as the elevated railroad siding and a tall storage tank can be retained for their unique character and incorporated into a fitness course.

   The non-floodplain portion of the site on Summit St., although small, might be appropriate for creatively designed housing or community use that fronts on the Greenway.

Implementation Time Line

Phase 1 (short term)

- Site is public property and has no acquisition cost.
- Demolish buildings and structures per design; retain identified structures and site features.
- Install initial phase of floodway garden and paths.

- Develop programming to establish a regular schedule of Greenway uses and events. Seek partnerships with Ann Arbor Community Center, Ann Arbor Art Center, Dance Gallery, recreational groups, public arts groups, neighborhood associations, civic groups, public schools and local businesses.
- Develop funding sources for activity programming.
- Work with AARR to landscape railroad right-of-way.

Phase 2 (medium term)

- Continue installation of the floodway garden paths.
- Begin installation of active recreation facilities and "community green" areas.
- Continue to develop programming and funding.

Phase 3 (long term)

- Complete final installations.
- Make modifications as needed in response to changes in immediate vicinity (development on N. Main, connections to Bluffs Park, etc.).
- Continue to develop programming and funding sources.

Summary

> "Make no small plans. They have no magic to stir humanity's blood and probably themselves will not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical plan once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever-growing insistency."
> *– Daniel Burnham; American architect and city planner, 19th Century*

This site should be meaningful to all Ann Arbor. Positioned at a main entry to the City, it will be the link between the Allen Creek Greenway and the Huron River Greenway and provide connection to the county-wide Border-To-Border Trail network. This important location should be conceived of as a grand and memorable portal that speaks volumes about Ann Arbor's vision for a sustainable and livable future.

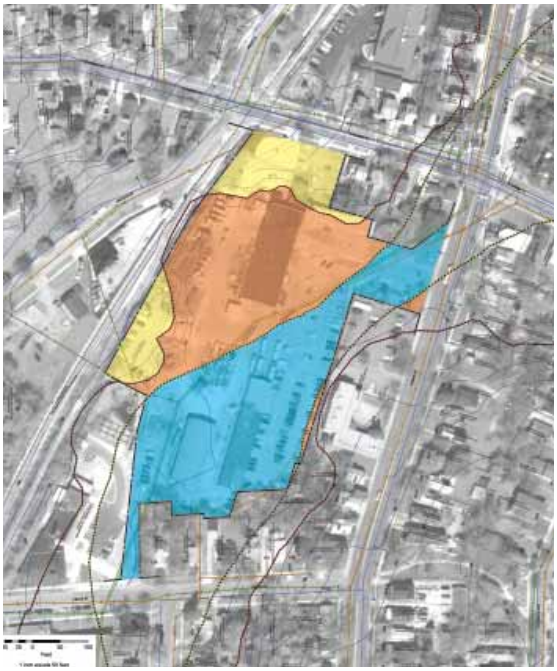
Open space use of 721 N. Main commits to a "big plan" vision of the Greenway and keeps the door open to future possibilities. We must accept the challenge of planning for a future that we would wish to provide for our children's grandchildren. If fully realized, the Allen Creek Greenway will be an enduring and enriching legacy.

Pros

- Facilitates rail and bus transit
- Potential for City revenues and use of Brownfield Funds
- Provides activity/"eyes" with mixed use development
- Possible stimulant for additional developments

Cons

- Mixes motorized and non-motorized uses
- Adds new building within the floodplain
- Potential neighborhood impacts and opposition



Floodway

Flood fringe

Upland

Alternate B ~ New Mixed-Use Neighborhood and Additional Open Space

This site's notable features of size, location, degree of separation from its surroundings by the railroad embankment and primary streets, and the mixed-use qualities of its immediate neighbors, combine and point to the ability of this property to absorb new mixed-use development and additional open spaces for Greenway use beyond those contained within the floodway.

Key Considerations

With the departure of the City to a consolidated service center elsewhere, this site is land with the potential to be another active "neighborhood", and a key active and passive open space component of the Allen Creek Greenway. Mixed-use development is illustrated on approximately 2 acres of the 5.1 acre site. This expands the Greenway open space by 0.66 acres, from the 2.44 acre floodway to 3.1 total acres, or 60% of the site.

Location and elevation of the railroad track, and the site's proximity to Depot St. for cross-town access to the Medical and Central Campuses, make this location a candidate for a primary passenger rail stop coordinated with AATA/U-M bus service.

Design Intent and Rationale

Providing a mix of uses and activities such as office, cultural, modest amount of commercial, residential, and a possible passenger train station with a bus transfer facility, and all fronting onto the Greenway with its expanded open space, will

1. place people directly on and into the Greenway;
2. take public advantage of the potential rise in property value and investment with the open space commitment;
3. demonstrate to owners of adjacent warehouse and industrial property, the possibilities of mixed use and higher density with green building principles proposed for "green" developments within City limits; and,
4. as per the housing proposed for part of the 415 W. Washington site, use the financial potential of the land to access Brownfield funding to help support soil remediation, and private and public property improvements.

Program and Design Form

Improvements to the expanded, approximately 3.1 acre

available open space should be in keeping with the Task Force's consensus design criteria suggested earlier for the floodway portions of First and William and 415 W. Washington sites: open space uses and activities placed into the land in patterns that invite participation, and then shape experience and offer learning. The opportunity exists to keep some of the current structures, although in a modified and deconstructed form of posts or columns and roof for floodway and flood fringe benefits, and use them for recreation and as components in an environmental education/interpretive program of the site's history.

1. **Program within the floodway**
   Open space potentials range from a network of paths for access, rain gardens for water quality improvements, and community gardens to passive and active recreation activities, picnic shelters, and areas for sitting, gathering and flexible activities and exhibits.
2. **Program beyond the floodway**
   Some additional open space as an extension of the features described above might include a mixed-use complex with parking for cars, buses and bikes on the ground level with an additional one or two floors of parking and a variety of uses from office to cultural/exhibit/performance spaces, support retail and residential above the parking. Common spaces inside and on-site, utilizing green roof principles for design of plaza levels and rooftops, offer another means of adding open space.

In more detail, the intent of Alternative B's design as illustrated includes

1. meandering stream-like lines of movement as pathways, rain gardens, activity areas and rainwater BMPs, all using forms mimicking the flow of water;
2. form and layout of buildings and site that integrate with and respond to the Allen Creek Greenway's open space on-site, and are linked to off-site connections;
3. building and site design that meets or exceeds Federal, State and local floodplain laws and requirements;
4. references to architectural past, including former storage sheds that, with deconstruction, could become shelters and interpretive stations;
5. green building requirements including little to no rain-water runoff;
6. vehicular access to the parking deck from W. Summit, with buses entering the transfer point from W. Summit and departing via Main St. (for eastbound Depot St. or

Looking North to Summit Street

southbound Main St.) and limited ground level vehicular parking access from Main St.;

7. a rail passenger terminal and covered platform trackside, and interior connection to a covered bus transfer point at grade level;
8. improved Greenway frontage, with visual and physical access into the site from Main St. as part of the Greenway's presence on this main artery;
9. sequence of spaces from public to semi-pubic to semi-private to private; and,
10. buildings that encourage use of the Greenway and express both the open space and their presence in the Allen Creek valley.

Implementation Time Line

Phase 1 (short term)

- Upon completion of the City move to the new garage in fall of 2007, relocate site perimeter fencing to secure the site while allowing space for improvements to the frontage on surrounding streets.
- Discuss and finalize the approach to use of brownfield funding to remove remaining soil contaminants on the three City sites.
- Discuss and finalize the mixed-use program including overall number of residential units, and percentages of affordable, work force and market rate housing.
- Discuss and develop metrics for financing, possible developer maintenance of the adjacent Greenway, relationship of new mixed-uses to the Greenway and the general vicinity, and revenue generation.
- Develop an RFP for a public-private partnership to move forward with planning, design and implementation of the Greenway and new mixed-use proposal.

Phase 2 (medium term)

- Issue the RFP, evaluate responses based on accessing brownfield funds, housing program, Greenway implementation, and other factors identified during the RFP process, and select the most advantageous proposal.
- Developer to proceed with design, seek required City, County and State approvals prior to proceeding with construction.
- Implement Greenway and housing consistent with plan and permits as approved.

Phase 3 (long term)

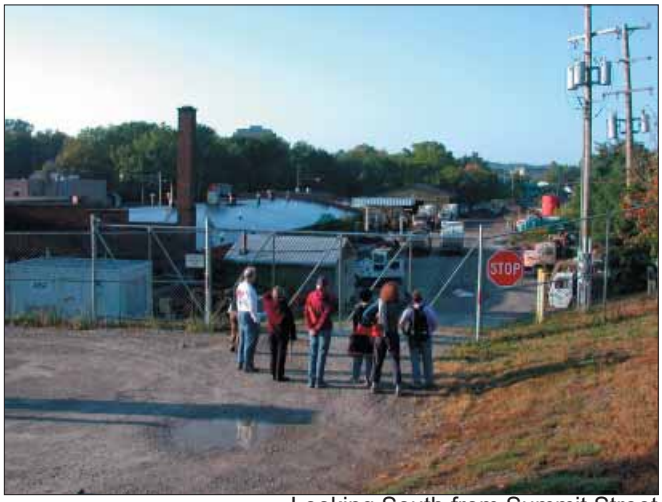
- Initiate agreement between City and housing association to monitor, manage and maintain the Greenway and housing's adjacent open space.
- Jointly monitor rainwater runoff BMPs for any needed changes.
- Jointly monitor and adjust programming of the Greenway's open spaces if/as needed.

Summary

View East to Main and Depot Streets

The soon-to-be vacated N. Main St. City maintenance garage, as a larger property in this location, presents greater open space and mixed-use development possibilities, and a more complex public-private partnership set of relationships and dependencies. A longer time frame to conceive, confirm and implement any proposal is likely. Two benefits can result: an added opportunity to consider the Allen Creek Greenway's connections to the Huron River, which involve MDOT and the Norfolk Southern Railroad, and, the sequential phasing of changes to the three City sites. The 5.1 acre N. Main site can also accommodate and integrate its two institutional neighbors (Art Center and Community Center) into the changes.

The history of this City site can remain to tell one side of an environmental tale as the new buildings' and the site's qualities speak to one another. Alternate B, as presented, has the potential to be integrated into Ann Arbor in both time and place.



Looking South from Summit Street

Section 4. Implementation

First and William

415 W. Washington

721 N. Main

Section 4. Implementation

The Allen Creek Greenway is an idea and an opportunity. The Task Force was charged by City Council to substantiate the Greenway's potentials and, in effect, consider to what degree the three City-owned sites might become initial components of a recreation and transportation corridor in the Allen Creek valley.

In so doing, ideas for the Greenway's activities, amenities and facilities, were collected, discussed and narrowed to the potentials presented in Section 3. Recommendations exist where consensus was reached; alternatives reflect different points of view found for how the three City sites can be used to benefit a Greenway.

The Task Force's recommendations are

1. **First & William**, Parking Lot
   The Task Force consensus recommendation for First and William is its conversion from parking lot to "urban garden", with the possibility of including a passenger rail stop, if north-south passenger service is implemented.

2. **415 W. Washington**, City Maintenance Garage
   There are three options for the area beyond the floodway at the City maintenance garage at 415 W. Washington:
   a. all open space,
   b. re-use of the existing primary building, and
   c. new residential buildings and additional open space;

3. **721 N. Main**, City Maintenance Garage
   There are two options for the area beyond the floodway at the City maintenance garage at 721 N. Main:
   a. all open space, and
   b. new mixed use buildings and additional open space.

4. **Connectivity**, existing rights-of-way
   There are initial opportunities to link the City's three sites to each other and to the Huron River Greenway, using the City's streets and sidewalks in the public rights-of-way.

Next Steps

The process of implementing the Greenway should begin when the City consolidates maintenance functions to its Pittsfield Township facility in the fall of 2007 and two of the three City sites become vacant property. More specifically, the Task Force recommends the following sequence of actions.

Sites for Fall 2007 improvements

1. **Site improvements** to both First and William and 415 W. Washington should occur very soon after the W. Washington site is vacated, with construction occurring concurrently. Initial landscape and access enhancements will facilitate the public's safe use of the land for visual and physical access.
   - **First and William** improvements could include modest parking lot reconfiguration, symbolic water flow imprinting in the remaining pavement as per plan, the Ashley Street pocket overlook park, and Greenway interpretive signage.
   - **415 W. Washington** improvements include security fence relocation, pathway surface and seating between Liberty and Washington, new plantings along street frontages, and Greenway interpretive signage.

   City Council (aided by Administration, Parks, and DDA) affecting literal physical changes to these two sites can help to collect and direct community thinking about possibilities, and demonstrate Council's willingness to engage in needed decision-making.
2. Planning Commission and City Council should guide dialogue about **floodplain and development policy** so that use of the three City sites beyond the floodway can be decided. The community's collective voice and Council's resolution of the choice between either allowing new buildings to be built (or existing buildings to be rehabbed and reused consistent with applicable laws and requirements) or no longer permitting any architectural development in a floodplain.
   - Review of new and emerging floodplain data for its possible implications and impacts is a necessary part of the decision process.
3. A three-site **assessment of soils and remediation** involved should be conducted by the City, and the potential for use of Brownfield funding investigated.
4. An **existing building analysis** of 415 W. Washington and 721 N. Main including structural condition, HAZMAT issues, and other factors should be undertaken by the City.
5. City Council, with possession of the above findings 2, 3 and 4, and any other information gathered as needed, should engage in a **dialogue about the recommendations and alternatives** for City-owned land, and reach a decision.
6. City Council (aided by Administration, Parks and DDA)

should deliberately **pursue new and continuing discussions** with both railroads, MDOT and The University about a longer term vision of an off-road Greenway in the Allen Creek valley.

7. And, finally, the City should develop **a list of other public and private parties** with an interest and a role to play in the Greenway, and continue to move forward with the process of planning, design, funding and implementation.

The above offers a guideline for implementation of the Allen Creek Greenway, beginning with initial improvements to signify its beginning. Policy determinations, acquisition of additional site information, and consideration of funding alternatives complete the agenda for Council in order to conclude its decision-making for a larger scale and scope implementation of the Greenway.

Funding the Allen Creek Greenway

Development of the Allen Creek Greenway will face funding challenges similar to those of the other parks, trails, and greenways incorporated into the City's parks and open space system, and potential sources of funding are similar. Funding requirements fall into three cost categories:

- **land acquisition and easements**
- **park and trail development**
- **on-going management and maintenance**

Land Acquisition and Easements

Dedication of public lands within the Allen Creek valley and funds from the Open Space and Parkland Preservation Millage (the "Greenbelt millage") are two possible tools available for acquiring land for the Greenway. Other potential funding sources include federal and state grant programs, public and private non-profit organizations, and potential partner institutions.

Dedication of Public Lands

Three variously sized parcels within the Allen Creek valley are already publicly owned. They total 8.60 acres consisting of 7.63 acres of floodplain (4.10 Ac of floodway and 3.53 Ac of flood fringe) and 0.97 Ac of upland potentially available for open spaces along the Allen Creek corridor with no acquisition cost.

Open Space and Parkland Preservation Millage

Funds from the 2004 Open Space and Parkland Preservation millage (a.k.a. the "Greenbelt millage") can be used for the purchase of conservation easements as well as additional

parcels along the Greenway. By resolution, Council guidelines state that 1/3 of the total millage revenues will be spent on land acquisition for the City's park system.

Total anticipated tax revenue from the 30-year millage is approximately $80 million. With the $20,250,000 bonded in 2005, the fund balance at the beginning of FY 2006-07 is $22,000,000.

Selected Federal and State Grants
Promising sources include

- Michigan Natural Resources Trust Fund
- National Park Service Land and Water Conservation Fund
- Pre-Disaster Mitigation Grant Program

Requirements and funding amounts for these sources can be found in the Appendix.

Other Potential Acquisition Mechanisms and Partners
The City can coordinate with the University of Michigan to determine feasible non-motorized routes through University properties and with the Ann Arbor Railroad for easements along the rail corridor.

The Allen Creek Greenway Conservancy, a new 501(c)(3) non-profit formed to raise funds for the purchase of land for the Allen Creek Greenway, may become a viable source of donated land in the future.

Park and Trail Development

Funding sources for the development of the Greenway parks and trails include the new parks millage, DDA TIF revenues, and various state and federal grants. Funds may also be raised from the sale of city properties which, in turn, could open up the possibility of Brownfield funding. New development within the downtown core or elsewhere in the watershed might be given the option to fulfill rainwater mitigation requirements on the three City properties.

Park Maintenance and Capital Improvements Millage
In November 2006, voters approved a new six-year 1.10 mill Park Maintenance and Capital Improvements Millage that is expected to raise $4,866,585 in revenue in fiscal year 2007-2008. According to the policy guidelines approved by City Council for the administration of the millage, between 60% and 80% of the revenues are to be used for park maintenance and repairs and between 20% and 40% for capital improvements.

Development of the Allen Creek Greenway trail system would fall into the capital improvement funding category of Pathways, Trails, Boardwalks, Greenways, and Huron River Watershed.

Development of destination open spaces along the Greenway would fall into the capital improvement funding categories of Active Parks, Neighborhood Parks, Urban Plazas, and Recreation Facilities depending on the design of the park.

With limited funds for capital improvements in each of these categories, and competing needs throughout the park system, a strategic plan and timeline will need to be carefully developed.

Downtown Development Authority
The DDA may contribute funds to finance development of portions of the Greenway within its district. The DDA may proactively establish a fund for Greenway development, and/or respond to proposals from the City, non-profit organizations, or neighborhood groups to fund specific Greenway projects. Such use of its funds conforms to its Downtown Development and Tax Increment Financing Plan for 2003-2033 which lists "support of the creation of an Allen Creek Corridor Land Use Master Plan conducted in collaboration with others, including the potential development of a system of linked open spaces and a pedestrian/bicycle path along the rail line and as rainwater runoff mitigation as a current priority."

Development of the Greenway can help the DDA fulfill some of its objectives stated in its plan:

- Encouraging the development of public land to meet community goals and attract people and businesses to downtown Ann Arbor.
- Mixed land uses that will promote a varied population throughout the day and night.
- Preservation of open space, natural beauty, historic buildings, and critical environmental areas.
- Sustainability as a fundamental tenet of downtown development to ensure requirements of the present are met without compromising the needs of the future.
- Enhancement of downtown's identity as a unique and special place.
- Fostering distinctive, attractive neighborhoods with a strong and unique sense of place.
- Participation of citizens and stakeholders in development decisions to foster involvement, ownership and pride in community.

415 W. Washington

721 N. Main

Mitigation Fund from New Developments
New development projects within the downtown core might be given the option to fulfill some of their rainwater mitigation requirements by contributing to enhanced mitigation effects on the City properties. This tactic would need to be used very carefully and only in appropriate situations.

Sale of Public Land
The City should carefully consider the costs and benefits of the sale of public land in the floodplain. The portions of the 415 W. Washington and 721 N. Main parcels that lie within the flood fringe but outside the floodway could be sold for redevelopment, with the revenues of those sales used to

- fund the development of Greenway open spaces in the floodway portions of the three City parcels;
- purchase land and/or easements to develop continuous linkages along the Allen Creek Greenway; and,
- fund other municipal projects.

If all or portions of the parcels are sold for development, a deed restriction can be put in place that requires the new owner to develop and maintain those portions of the land purchased as Greenway and requires all subsequent owners to maintain the Greenway as public open space in perpetuity.

When looking at this option, it must be recognized that there is limited opportunity for new land acquisition to provide open space needs within and near the downtown core. The 2003-2033 DDA Plan notes that nearly all of the DDA District is built up, with little property remaining for potential future open space, and that the City could be encouraged to consider the possible acquisition of private property to enable plans for open space to be realized.

Given these facts, sale of these public lands in and near the downtown core for any reason may be controversial. Public reaction will likely vary according to how the proceeds from the sale of these public lands will be used, i.e. whether used for Greenway and open space development or for other municipal projects. There is also some public sentiment that the sale of public lands in the floodplain for new development is especially problematic because of concerns about the impact of increased development within the floodplain on Huron River water quality, rainwater management, and flood hazard mitigation. At the same time, any redevelopment (public or private) of the three City sites results in environmental improvements as new development must meet all applicable codes, laws and regulations, and the existing City sites currently do not.

Consideration of the three City-owned sites as one

Brownfield TIF
The sale of a portion of the city parcels for redevelopment could trigger eligibility for tax increment financing for Brownfield redevelopment. Within the City of Ann Arbor, any property designated as 1) a "facility" or contaminated under state law, 2) obsolete, or 3) blighted may be eligible for Brownfield economic redevelopment incentives including Tax Increment Financing (TIF) or Small Business Tax (SBT) credits. Tax Increment Financing allows the Washtenaw County Brownfield Redevelopment Authority to capture new taxes on projects with an approved Brownfield Plan. Taxes may be captured for up to 30 years and the DDA has first right of refusal on the new taxes for projects within the DDA district. The contamination present at the First and William site could qualify it as a "facility."

To the extent the Allen Creek Greenway is developed as one large project, contamination in one portion of the "site" may create eligibility for Brownfield funding that can be used anywhere within the project's boundaries even if the sites are not contiguous, so long as the various sites complement the redevelopment. In other words, one portion of the site may be contaminated and planned for open space use (First and William) with no increase in the taxable value. However, another portion of the site (e.g. the flood fringe portions of 415 W. Washington or 721 N. Main) may include redevelopment that increases the taxable value and generate taxes that may be used for environmental remediation on the First and William site.

Selected Federal and State Grants
Promising sources of funds include

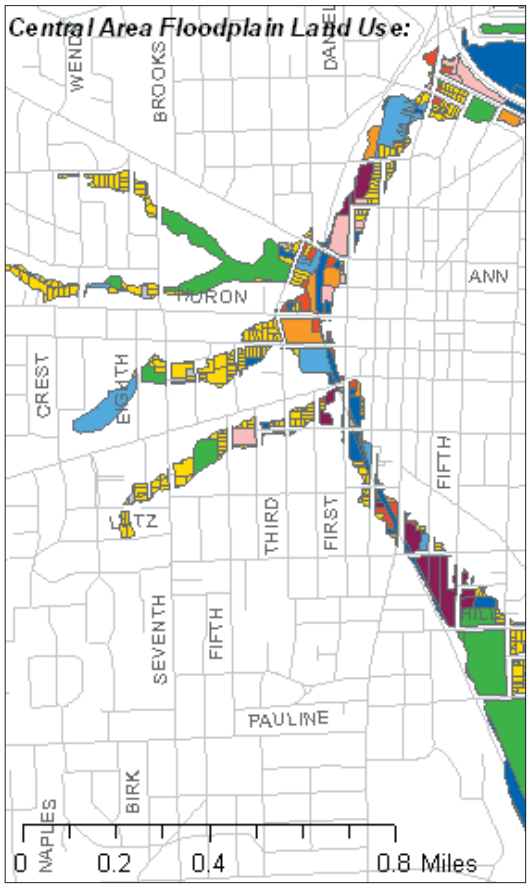
- Michigan Natural Resources Trust Fund
- National Park Service Land and Water Conservation Fund
- National Park Service Rivers, Trails and Conservation Assistance Program ("Rivers & Trails")
- Pre-Disaster Mitigation Grant Program
- Flood Mitigation Assistance Program
- Transportation Enhancement Program
- Congestion Mitigation and Air Quality Improvement Program
- Michigan Department of Environmental Quality (MDEQ) Coastal Management Program
- MDEQ Non-point Source Program
- MDEQ Brownfield Redevelopment Assistance
- Private Foundation Grants

Requirements and funding amounts for these sources can be found in the Appendix.

Resources for Greenway Maintenance

Once developed, ongoing maintenance of the Greenway and its open spaces is appropriately funded by:

- that portion of the new six-year Park Maintenance and Capital Improvements Millage dedicated to park maintenance and repairs. This 1.10 mill is expected to raise $4,866,585 in revenue in its first year (FY 2007-2008) and between 60% and 80% of the total millage revenue is to be used for maintenance and repairs over the entire park system.
- that portion of the General Fund allocated yearly to the parks and recreation system. The funding distribution guidelines for the new Park millage specify that maintenance and repairs of pathways, trails, boardwalks and greenways is to be covered by both the General Fund and the millage, and snow and ice control maintenance is to be funded exclusively by the General Fund.
- a "business improvement district" (BID) comprised of private land owners and business corporations formed as an association whose purpose is to maintain the Greenway open space. Typically, BID associations maintain foreground spaces immediately adjacent to their member properties and interests.



In addition to existing City resources, the Adopt-A-Park model should be promoted to engage private citizens and community groups to monitor and maintain discrete portions of the Greenway and its parks.

Conclusions

To recap, the following seven items are the more major decision points for resolution by Council and the community.

1. **Mixed-use of the flood fringe** on 415 W. Washington and 721 N. Main involves discussion of floodplain policy, and the results could have impacts well beyond use of the City's three sites in the Allen Creek valley.
2. **Floodplain policy** and the decision to prohibit or permit future work on new or existing buildings in the floodplain, i.e., to meet or go beyond current local, State and Federal statutes, is but one needed action; the other is realization that the existence of a floodplain hazard is a symptom of upstream conditions, and that the effort work to minimize

flooding and mitigate related hazards also includes implementing solutions to **watershed–wide problems**.

3. The Greenway, to be successful, **requires a commitment** of both the community's human and dollar resources, and determining the method to insure commitment over time.
4. **The University** is an important partner in the Greenway's long term vision, specifically in linking paths to the Stadium Boulevard bridge over AARR track and alternate off-road routing within The University's Athletic Campus.
5. **MDOT and the AARR** must be approached and encouraged to support the Greenway in concept and in place, by sharing its right-of-way for use as a rail-with-trail.
6. Discussions with **Norfolk Southern Rail Road** must also continue so that the Ann Arbor community south of the river can cross its tracks at logical and intuitive locations as a necessary part of the solution to stop currently illegal crossings.
7. The Allen Creek Greenway's **becoming a reality** involves both the leap of faith to deliberately do something now as recognition of the fact that a first step is the beginning of a much longer term implementation process.

To conclude, the Greenway as an urban gathering space, a place of refuge, a green retreat, and a cultural and civic destination is a desirable achievement for these City-owned sites. The floodway portions can begin to be transformed in a short period into the initial phase of a Greenway with landscaping, seating areas and activity spaces. The residents, downtown workers and visitors can begin to use and appreciate the amenities of the Greenway soon after the City vacates the two garage sites.

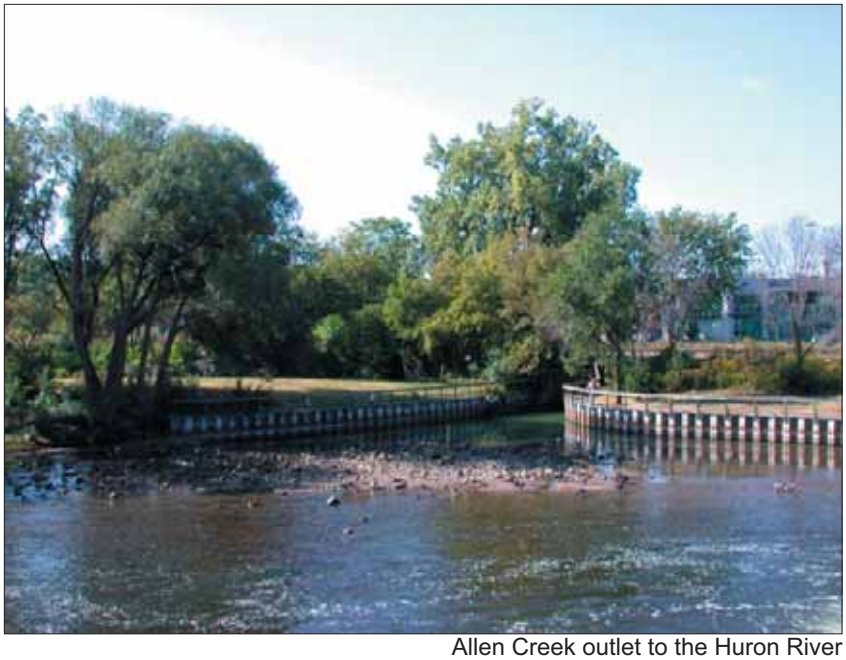
City Council can decide the direction of the floodway portions of the Greenway within the next six months so that initial implementation can begin once the sites are available. The community is clearly eager to participate in the planning process as Council addresses decision about the use of flood fringe and upland portions of the City's parcels. Both the nearby residential neighborhoods and retail/office associations would welcome the opportunity to assist in the design of this Greenway as a focal point.

Consideration of the floodway portions of the sites is the first step in a much larger community planning effort. As new information about site conditions becomes available, as policy decisions are made, and as other sites become available, next

steps leading to confirming and implementing the longer term vision can be taken.

Funding is a critical component in planning the development of these sites as the Greenway. The initial development may be modest, based on available funding. In addition to existing park funds, there are many opportunities for grants; potential sources were discussed earlier in the report.

Lastly, we conclude the tenure of the Task Force by expressing our appreciation for the opportunity to have examined the many facets of the vision for a Greenway along one edge of downtown Ann Arbor leading to the Huron River. ACGTF members have striven to fully understand the implications of the data we had before us and to consider with great care the different points of view within our group and the wider community. We fully support the idea and the reality of an Allen Creek Greenway and look forward to its evolution with time.



Allen Creek outlet to the Huron River

Section 5. Appendix

Acknowledgements

Public Participation Process

Funding Sources

Floodplain Information

Water Quality Sizing Information

Acknowledgements

The Task Force was assisted by many persons in the community. They include

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Public Participation in the Work of the Allen Creek Greenway Task Force

Since the late 1970s, people in Ann Arbor have talked about the potential for a greenway adjacent to the downtown area, within the Allen Creek floodplain. In an effort to explore this idea, the Ann Arbor City Council created the Allen Creek Greenway Task Force in August 2005.

Part of the Task Force's charge was to consult with the public during its planning stages. Effective public participation on any issue, especially one which is in its planning stages and that includes many technical and abstract elements, requires a certain amount of public education. This was approached through many different methods to reach the broadest audience possible. These include: exhibits, with continually updated information, displayed throughout the length of the process in several public locations; an information repository held in the main public library; public lectures discussing the concept of urban greenways held early in the process; Task Force business meetings and public workshops made open to the public and televised on CTN with repeated broadcasts shown through out the week; and a website containing a plethora of back-ground information, public meeting summaries, meeting minutes and current work products was maintained throughout the Task Force effort and can be found at http://www.a2gov.org/greenway/.

The hallmark of the public participation process was three public workshops held on April 22, April 29 and August 2, 2006. Over the course of the three events, more than 130 citizens came out to express their diverse opinions. Each workshop had two main parts – first, an educational presentation concerning the work of the Task Force and the Greenway and second, public participation based on the information presented using different methods of public engagement to collect information.

The first public workshop was designed to engage the public in a discussion of the "Big Picture" of the Allen Creek Greenway. Several questions were posed to attendees covering different aspects of a greenway, such as personal vision, connections between other parks and path-ways, role of the greenway in transportation, and architecture on the three main city-owned sites. Lively discussion in small groups was facilitated by a moderator and recorded. A summary of the discussions, showing the diversity of public views about the Greenway is provided in the Appendix.

The second public workshop focused specifically on the three city-owned sites to be included in the Allen Creek Greenway. The Task Force developed three visions for each site that provided a vision of an "Open Space Emphasis," "Blended Space Emphasis" and an "Architectural Emphasis" to reflect the amount of architecture that could be included in the three sites. Comments based on the pros and cons of each vision were recorded. The summary of public comment is provided in the Appendix.

The final public workshop, held near the end of the Task Force's work, presented information about the work of the Task Force to that date and how they had incorporated what they heard and what they learned from the public from the first two workshops. New visions for the three city-owned sites were presented and public testimony was taken from the public. A summary of each public comment is provided in the Appendix.

Citizens who could otherwise not attend a public meeting were provided information to respond to on the Internet. Workbooks of information and methods, times and alternative ways to participate were also provided to all workshop attendees and available for downloading from the Internet. Citizens were also given the option of responding and providing comment through mail, fax and e-mail.

Selected Grant Sources

Selected Grants for Acquisition of Land and Easements

Michigan Natural Resources Trust Fund

This State program provides matching grants for local outdoor recreation needs including land acquisition. Acquisitions that create or improve natural resource-based outdoor recreation opportunities and protect natural resources are favored. Improvements to Huron River water quality and the addition of recreational opportunities afforded by the greenway could make the project competitive.

- Approximately $20-$25 million is available each year
- No maximum for acquisition projects
- Requires at least a 25% local match

National Park Service Land and Water Conservation Fund

The State Side Grant Program provides matching grants to local governments for the acquisition, as well as the development and planning of public outdoor recreation areas and facilities. 75% of the total funds have gone to locally sponsored projects to provide close-to-home recreation opportunities that are readily accessible to youth, adults, and senior citizens.

- FY 2003: $94,383,000 was available to States and Michigan received $2,769,402
- Minimum award: $25,000; Maximum: $500,000
- 50% local match required
- Availability of funds for acquisition varies by year; no acquisition projects were funded in 2005.

Pre-Disaster Mitigation Grant Program

Once the City finalizes its Flood Hazard Mitigation Plan as a component of its Multi-Hazard Mitigation Plan, Ann Arbor will be eligible to compete for federal funds from this program, which includes grants for the acquisition of land for open space that will reduce overall risks to the population and structures.

- Minimum total award for state is $500,000; Maximum award for state is $15,000,000 for 2007. All states will receive no less than $500,000 providing that the state submits grants totaling at least that amount.

Selected Grants for Park and Trail Development

Michigan Natural Resources Trust Fund

In addition to grants for land acquisition (see above), this is a source of matching grants for the development of outdoor recreation facilities and amenities that protect natural resources.

- Maximum for development projects is $500,000
- Requires at least a 25% local match
- For development projects, applicant must control entire site

National Park Service Land and Water Conservation Fund

In addition to funding land acquisition (see above), the State Side section of this grant program provides grants for the development and planning of public outdoor recreation areas and facilities, favoring projects that provide close-to-home recreation opportunities accessible to youth, adults, and senior citizens.

- FY 2003: $94,383,000 was available to States and Michigan received $2,769,402
- 50% local match required

National Park Service Rivers, Trails and Conservation Assistance Program ("Rivers & Trails")
Provides in-kind assistance to locally led efforts to conserve rivers, preserve open space, and develop trails and greenways.

- Provides dedicated professional staff to assist with project planning, management and coordination, identification of funding sources, and facilitation and consensus building.
- Project assistance typically one to three years during a project's infancy.

Pre-Disaster Mitigation Grant Program
In addition to funds for the acquisition of flood-prone properties (see above), this FEMA program provides grants for mitigation projects that could include demolition, creation of ponds, bioswales, water features, etc.

- Minimum total award for state is $500,000; Maximum award for state is $15,000,000 for 2007. All states will receive no less than $500,000 providing that the state submits grants totaling at least that amount

Flood Mitigation Assistance Program
Another FEMA program that provides grants to implement measures that reduce or eliminate the long-term risk of flood damage to structures insurable under the National Flood Insurance Program.

Transportation Enhancement Program
The Transportation Equity Act for the 21st Century Federal (TEA-21) sets aside 10% from the State's Dept. of Transportation allocation for this program administered by the Michigan Department of Transportation to fund projects that promote non-motorized transportation, support community redevelopment, recognize the diversity of potential users, and ensure accessibility and the safety and security of non-motorized users.

- Michigan funded $20,468,400 in 2006
- 20% minimum match

Congestion Mitigation and Air Quality Improvement Program
Another TEA-21-funded program. Projects must produce a demonstrable, cost-effective reduction in vehicle emissions.

- Michigan distributes funds based on population, with about 2/3 of state funding going to SE Michigan.
- SEMCOG region splits funding 50/50 between transit and other eligible projects.
- Funds pedestrian and bicycle projects providing alternative commuting choices such as non-motorized facilities linking people to work, shopping, or other necessities.
- Requires 20% match

Michigan Department of Environmental Quality (MDEQ) Coastal Management Program
A federal coastal program administered by NOAA in partnership with local states. Michigan's program includes the entire state shoreline along the Great lakes and connecting waters. Planning projects do not have to be located within the coastal boundary but must have a direct benefit to coastal resources by providing storm water protection or cleaning up contaminated properties that affect water property.

- Approximately 40 projects funded each year
- Maximum up to $50,000
- Most types require a 50% match; State funds may be used as match (e.g. MNRTF)

MDEQ Non-point Source Program
Awards planning and implementation grants through the State's Clean Michigan Initiative and the federal Clean Water Act.

- For planning and implementation of projects on a watershed basis that prevent, eliminate, or reduce polluted runoff and/or erosion.
- Planning grants requires 10% local match
- Implementation grants require 25% local match

MDEQ Brownfield Redevelopment Assistance
Provides grants and loans to help redevelop Brownfield sites with priority given to projects that incorporate other state initiatives such as green building and greenway concepts, walkable city concepts, non-point source controls, cool city neighborhoods, and traditional downtowns.

- Loan rates are 2%, with no payments the first five years of the 15 year term.
- Applicant can be a local unit of government or a brownfield redevelopment authority
- Must demonstrate financial need and local contribution.
- Redevelopment must be identified or likely

Private Foundation Grants
Available from a variety of local and national foundations. In cases where the award amounts are too small to justify time and effort by City staff, non-profit organizations and citizen's groups may apply for small grants to fund discrete elements of the greenway and/or its parks.

Floodplain and Floodway Information

Background

The Federal Emergency Management Agency (FEMA) created flood maps called Flood Insurance Ratio Maps (FIRMs). These maps generally used topographic information from United States Geological Survey (USGS) maps. USGS maps use a very large scale and are not very precise (10-foot contour intervals). They show the general location of floodways and floodplains. City must use them in order for the City and its residents to be eligible for National Flood Insurance Program (to get flood insurance for homes and businesses in floodplains and floodways). Proposed development projects must FIELD VERIFY [emphasis in original notes] flood elevations since FEMA maps are not precise.

Rule: Can't build new residential in floodway; prohibited by the State. Can build residential in floodplain, as long as the lowest floor elevation is at least 1 foot above the elevation of a 100-year flood and an MDEQ permit is issued. Must show no net loss of flood storage capacity (e.g. new buildings should allow floodwaters to flow under them), AND no increase of flood stage at property line (e.g. can't increase flooding on neighbor's property).

Rule: Can build non-residential in floodplain and floodway as long as an MDEQ permit is obtained and the structure is elevated or flood-proofed to an elevation 1 foot above the 100-year flood.

Rehab Rule: Renovation of a building in the floodplain/floodway cannot exceed 50% of the value of the structure; residential rehabs must elevate the entire structure to 1 foot above the 100 year flood elevation; non-residential can choose to either elevate the structure 1 foot above the 100 year flood level or flood proof. If a petitioner does not propose to add to the building footprint or add more than 50% of value, no flood requirement exists.

Historic Preservation Rule: Modifications to historic properties that do not increase the building footprint are exempt from floodplain requirements in the state building code.

Provided by Jerry Hancock on March 15, 2005. A study is underway to obtain more precise mapping of floodway and floodplain boundaries.

Current Floodplain Regulations

Pertaining to the three city-owned sites in the Allen Creek floodplain

General Criteria

Construction projects within the Allen Creek Drain easement require a permit from the Washtenaw County Drain Commissioner

Construction projects within the floodplain require a permit from the Michigan Department of Environmental Quality (MDEQ). Flood flow may not be obstructed in a manner that causes a rise in flood elevations at the property line.

State, County, and City all require no net loss of flood storage capacity; i.e. no fill without compensatory dredging.

Floodway Requirements

State law prohibits new or expanded residential uses.

The lowest floor of any new non-residential structure must be elevated or flood-proofed to an elevation 1 foot above the 100-year flood elevation.

Flood Fringe Requirement

In the area of the floodplain outside the floodway, the lowest floor of any new residential structure must be elevated to an elevation 1 foot above the 100-year flood elevation.

The lowest floor of any new non-residential structure must be elevated or flood-proofed to an elevation 1 foot above the 100-year flood elevation.

Other Considerations

Flood Mitigation Plan – The City received a 75/25 grant from the Michigan State Police (MSP) Emergency Management to develop a Flood Mitigation Plan. The purpose of the plan is to develop strategies to reduce flood losses, minimize damage to public and private property and protect public health and safety. The grant ends in September 2005 unless an extension is requested. Public input is being sought to assist in selecting mitigation strategies. City Staff will be working directly with City Planning Commission and City Council to develop the final plan recommendations. The final recommended plan will be submitted to City Council and the MSP for consideration.

Map Modernization - All of the floodplains in Washtenaw County are in the process of being converted to digital format by the Federal Emergency Management Agency (FEMA). The Michigan Department of Environmental Quality is a Cooperating Technical Partner in that process and has funded a restudy of the Main branch and the West Park-Miller branch of Allen Creek. The consultants are currently in the process of surveying and data analysis. While we currently do not know if the flood elevations and boundaries will be moving up or down, by small or great amounts, we do know they will change. The first draft maps should be available late fall 2005 for review. It is anticipated that revised FEMA maps will be presented to City Council for adoption to become official in late 2006.

Observations

At this point in the Map Modernization/revision process, we know that floodplain boundaries, floodway boundaries, and base flood elevations are all likely to change. For example, a residential building approved at site plan stage adjacent to the floodway, could be in the floodway after the maps are revised and thus not be permitted by the MDEQ. It is advisable that decisions made about specific sites take into consideration the likelihood that floodplain boundaries, floodway boundaries, and base flood elevations will be subject to change during the Map Modernization project.

Prepared by Jerry Hancock, Certified Floodplain Manager
Land Development Coordinator, Systems Planning Unit, Public Services Area June 2005

Water Quality Sizing Information for the Allen Creek Greenway Task Force

Surface flooding begins along Allen creek at approximately a 1.5-year storm event. The 1.5-year storm event is equal to the bankfull storm event in Washtenaw County, or approximately 2.3 inches of rain in a 24 hour period. Storing volumes of water beyond the bankfull event could interfere with flooding patterns. Controlling the bankfull storm event for the runoff from each site would provide water quality benefits without significantly exacerbating flooding. Since each of the three City owned sites receives direct surface runoff from adjacent properties controlling two (2) times the bankfull event will also be estimated.

Assumptions for evaluation
Floodway area developed into green space (C=0.30).
Flood fringe developed with 70% impervious area (C=0.75)
Water quality improvements are more effective in shallow water systems. 1.5 foot maximum depth assumed as the average depth of basins for this exercise.

First and William
Size of site = 1.00 acre
89% floodway
Full site runoff coefficient C=0.35

Volume required to control First Flush storm on-site = 635 cubic feet
- At 1.5 feet of depth this would take a 21 x 21 foot area

Volume required to control Bankfull storm on-site = 2,860 cubic feet
- At 1.5 feet of depth this would take a 44 x 44 foot area

2 X Bankfull = 5,720 cubic feet
- At 1.5 feet of depth this would take a 62 x 62 foot area

Comments: Given that the site is only 125 feet wide at the widest point, it may be difficult to fit in a surface treatment BMP facility much larger than the size necessary to treat the first flush without significantly reducing other potential uses. Also since there is known soil contamination, water quality improvements might be better accomplished through the use of water quality catch basins, such as Stormceptor, or catch basin filter systems. Stormceptor Catch Basin units cost approximately $6,000.00 plus installation. Two or three of these units could improve water quality from the storm water generated from this sites in events smaller that the bankfull event.

415 W. Washington
Size of site = 2.50 acre
32.4% floodway
Full site runoff coefficient C=0.60

Volume required to control First Flush storm on-site = 2,723 cubic feet
- At 1.5 feet of depth this would take a 43 x 43 foot area

Volume required to control Bankfull storm on-site = 12,255 cubic feet
- At 1.5 feet of depth this would take a 90 x 90 foot area

2 X Bankfull = 24,510 cubic feet
- At 1.5 feet of depth this would take a 128 x 128 foot area

Comments: Fitting in a shallow basin with native plant material, sized to control the bankfull storm event from the site, appears to be the most logical size facility that could be accommodated on the east side of the site. Anything larger than that would be difficult to fit in due to the size of the site and utility constraints.

721 N. Main St.
Size of site = 5.20 acre
47.1% floodway
Full site runoff coefficient C=0.54

Volume required to control First Flush storm on-site = 5,097 cubic feet

- At 1 foot of depth this would take a 58 x 58 foot area

Volume required to control Bankfull storm on-site = 22,941 cubic feet

- At 1.5 feet of depth this would take a 124 x 124 foot area

2 X Bankfull = 45,882 cubic feet

- At 1.5 feet of depth this would take a 175 x 175 foot area

Comments: There is adequate space on this site to accommodate the largest facility listed above and maybe larger. Treating the bankfull storm event for the site and the adjacent properties could be accomplished. Treating larger events could exacerbate flooding in the area.

APPENDIX H

EDR RADIUS MAP

(ON ELECTRONIC COPY ONLY)

415 West Washington
415 W. Washington
Ann Arbor, MI 48103

Inquiry Number: 3493977.2s
January 14, 2013

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

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GEOCHECK ADDENDUM

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

415 W. WASHINGTON
ANN ARBOR, MI 48103

COORDINATES

Latitude (North):	42.2806000 - 42° 16' 50.16''
Longitude (West):	83.7521000 - 83° 45' 7.56''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	273067.0
UTM Y (Meters):	4684386.0
Elevation:	809 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	42083-C7 ANN ARBOR WEST, MI
Most Recent Revision:	1983
East Map:	42083-C6 ANN ARBOR EAST, MI
Most Recent Revision:	1983

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	2009, 2010
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 7 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
CITY OF ANN ARBOR REMED PMT 392 9 415 W WASHINGTON ANN ARBOR, MI 48107	AIRS WDS	N/A
CITY OF ANN ARBOR 415 W WASHINGTON ST ANN ARBOR, MI 48103	RCRA NonGen / NLR	MIP200000776
PARKS & RECREATION BLDG 415 W WASHINGTON ST ANN ARBOR, MI 48103	LUST Facility Status: Open UST	N/A

EXECUTIVE SUMMARY

CITY OF ANN ARBOR 415 W WASHINGTON ST ANN ARBOR, MI 48103	RCRA NonGen / NLR FINDS	MID985640275
ANN ARBOR PARKS AND RECREATION 415 W WASHINGTON ST ANN ARBOR, MI 48103	FINDS	N/A

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators

Federal institutional controls / engineering controls registries

US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls
LUCIS ---------- Land Use Control Information System

EXECUTIVE SUMMARY

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Solid Waste Facilities Database

State and tribal leaking storage tank lists

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

AST ---------- Aboveground Tanks
INDIAN UST ---------- Underground Storage Tanks on Indian Land
FEMA UST ---------- Underground Storage Tank Listing

State and tribal voluntary cleanup sites

INDIAN VCP ---------- Voluntary Cleanup Priority Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
ODI ---------- Open Dump Inventory
SWRCY ---------- Recycling Facilities
HIST LF ---------- Inactive Solid Waste Facilities
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL ---------- Clandestine Drug Labs
CDL ---------- Clandestine Drug Lab Listing
US HIST CDL ---------- National Clandestine Laboratory Register

Local Land Records

LIENS 2 ---------- CERCLA Lien Information
LIENS ---------- Lien List

Records of Emergency Release Reports

HMIRS ---------- Hazardous Materials Information Reporting System
SPILLS ---------- Pollution Emergency Alerting System

Other Ascertainable Records

DOT OPS ---------- Incident and Accident Data
DOD ---------- Department of Defense Sites
FUDS ---------- Formerly Used Defense Sites

EXECUTIVE SUMMARY

CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
MINES	Mines Master Index File
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems
ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
RADINFO	Radiation Information Database
FINDS	Facility Index System/Facility Registry System
RAATS	RCRA Administrative Action Tracking System
RMP	Risk Management Plans
UIC	Underground Injection Wells Database
DRYCLEANERS	Drycleaning Establishments
NPDES	List of Active NPDES Permits
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US AIRS	Aerometric Information Retrieval System Facility Subsystem
PRP	Potentially Responsible Parties
Financial Assurance	Financial Assurance Information Listing
EPA WATCH LIST	EPA WATCH LIST
US FIN ASSUR	Financial Assurance Information
PCB TRANSFORMER	PCB Transformer Registration Database
2020 COR ACTION	2020 Corrective Action Program List
COAL ASH	Coal Ash Disposal Sites
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS list

CERCLIS: The Comprehensive Environmental Response, Compensation and Liability Information System contains data on potentially hazardous waste sites that have been reported to the USEPA by states,

municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

A review of the CERCLIS list, as provided by EDR, and dated 11/02/2012 has revealed that there is 1 CERCLIS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ARMEN CLEANERS	603 S. ASHLEY STREET	SSE 1/4 - 1/2 (0.383 mi.)	O61	108

Federal CERCLIS NFRAP site List

CERC-NFRAP: Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

A review of the CERC-NFRAP list, as provided by EDR, and dated 11/02/2012 has revealed that there is 1 CERC-NFRAP site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ARMEN'S CLEANERS	***630 S ASHLEY***	***SSE 1/4 - 1/2 (0.406 mi.)***	***O66***	***116***

Federal RCRA generators list

RCRA-CESQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-CESQG list, as provided by EDR, and dated 09/11/2012 has revealed that there are 8 RCRA-CESQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GT PRODUCTS INC	***315 S. 1ST ST.***	***SSE 0 - 1/8 (0.031 mi.)***	***B11***	***19***
MORNINGSIDE ANN ARBOR LLC	305 W LIBERTY ST	S 0 - 1/8 (0.052 mi.)	13	24
ROSS-BEAKES COLLISION	***314 W ANN ST***	***NNE 1/8 - 1/4 (0.136 mi.)***	***30***	***49***
SIR SPEEDY	***350 S MAIN ST***	***SE 1/8 - 1/4 (0.157 mi.)***	***32***	***60***
UNIVERSITY OF MICHIGAN	400 S 4TH ST	SW 1/8 - 1/4 (0.164 mi.)	H36	65
EMRE FUEL INC	***402 S MAIN ST***	***SE 1/8 - 1/4 (0.183 mi.)***	***38***	***69***
NATIONAL CITY BANK	101 S MAIN ST	ENE 1/8 - 1/4 (0.186 mi.)	I39	74
SHEESH	207 N MAIN ST	NE 1/8 - 1/4 (0.219 mi.)	43	80

State- and tribal - equivalent CERCLIS

SHWS: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Environmental Quality's' Contaminated Sites List on Diskette With Address.

A review of the SHWS list, as provided by EDR, and dated 10/31/2012 has revealed that there are 9 SHWS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
396-424 W. WASHINGTON/ANNARBOR Facility Status: Evaluation conducted	396-424 W. WASHINGTON S	E 0 - 1/8 (0.006 mi.)	A8	18
EATON CORPORATION Facility Status: Interim Response conducted	315 SOUTH FIRST STREET	SSE 0 - 1/8 (0.113 mi.)	25	44
U OF M ARGUS BUILDING Facility Status: See Leaking Underground Storage Tank Site Database	400 FOURTH ST	SW 1/8 - 1/4 (0.164 mi.)	H34	64
ARMEN CLEANERS Facility Status: Interim Response in progress	***630 S. ASHLEY STREET***	***SSE 1/4 - 1/2 (0.406 mi.)***	***O67***	***119***
H AND K CAMPUS PROPERTIES Facility Status: Evaluation conducted	212-216 SOUTH STATE STR	E 1/2 - 1 (0.548 mi.)	73	125

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported Facility Status: Evaluation conducted	***815 WILDT ST***	***NNE 1/2 - 1 (0.602 mi.)***	***75***	***126***
SHEFFIELD PHARMACEUTICALS Facility Status: Interim Response in progress	***912 N MAIN ST***	***NNE 1/2 - 1 (0.661 mi.)***	***76***	***127***
MICH. CON BROADWAY SITE Facility Status: Interim Response in progress	***841 BROADWAY***	***NE 1/2 - 1 (0.783 mi.)***	***78***	***128***
ANN ARBOR ART TRAIN Facility Status: Interim Response in progress	***1100 N MAIN ST***	***NNE 1/2 - 1 (0.873 mi.)***	***80***	***129***

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Environmental Quality's Leaking Underground Storage Tank (LUST) Database.

A review of the LUST list, as provided by EDR, and dated 11/05/2012 has revealed that there are 25 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ANN ARBOR IMPLEMENT CO Facility Status: Closed	***210 S 1ST ST***	***ESE 0 - 1/8 (0.041 mi.)***	***12***	***23***
LIBERTY STREET Facility Status: Open	221 W LIBERTY	ESE 0 - 1/8 (0.072 mi.)	C17	32
WCP INVESTMENTS PARTNERSHIP Facility Status: Closed	***117 N FIRST ST***	***NE 0 - 1/8 (0.090 mi.)***	***D19***	***34***

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BUDGET RENT A CAR Facility Status: Closed	***200 S ASHLEY ST***	***E 0 - 1/8 (0.103 mi.)***	***E22***	***39***
ASHLEY TERRANCE DEVELOPMENT Facility Status: Closed	***208 WEST HURON STREET***	***NE 1/8 - 1/4 (0.130 mi.)***	***F29***	***48***
U OF M ARGUS BLDG Facility Status: Open	400 4TH ST	SW 1/8 - 1/4 (0.164 mi.)	H35	64
EMRE FUEL INC Facility Status: Closed	***402 S MAIN ST***	***SE 1/8 - 1/4 (0.183 mi.)***	***38***	***69***
MAIN STREET GAS STATION Facility Status: Closed	***428 SOUTH MAIN***	***SSE 1/8 - 1/4 (0.233 mi.)***	***K44***	***81***
UNIVERSITY FUEL MART Facility Status: Closed	***300 N MAIN ST***	***NE 1/4 - 1/2 (0.261 mi.)***	***48***	***85***
A & L PARTS INC Facility Status: Closed	***521 S ASHLEY***	***SSE 1/4 - 1/2 (0.266 mi.)***	***L49***	***88***
CITY OF ANN ARBOR Facility Status: Closed	***100 NORTH 5TH AVENUE***	***E 1/4 - 1/2 (0.307 mi.)***	***M51***	***90***
CITY OF ANN ARBOR FIRE DEPT Facility Status: Closed	***111 N 5TH AVE***	***E 1/4 - 1/2 (0.307 mi.)***	***M52***	***91***
COMERICA BANK Facility Status: Closed	***300 E HURON ST***	***E 1/4 - 1/2 (0.308 mi.)***	***M53***	***95***
COMERICA BANK Facility Status: Closed	***312-314 E HURON***	***E 1/4 - 1/2 (0.320 mi.)***	***M54***	***97***
ANN ARBOR CO Facility Status: Closed	***324 E HURON ST***	***E 1/4 - 1/2 (0.331 mi.)***	***M55***	***98***
BEAKES STREET SERVICE STATION Facility Status: Closed	***101 BEAKES ST***	***NNE 1/4 - 1/2 (0.352 mi.)***	***56***	***101***
DE LONG BBQ PIT Facility Status: Closed	***314 DETROIT ST***	***NE 1/4 - 1/2 (0.366 mi.)***	***58***	***103***
JAPANESE AUTO Facility Status: Open	***563 S MAIN ST***	***SSE 1/4 - 1/2 (0.369 mi.)***	***N60***	***107***
CAMPUS AUTO Facility Status: Closed	***202 S DIVISION ST***	***E 1/4 - 1/2 (0.387 mi.)***	***62***	***109***
BRAUM FAMILY AGENCY Facility Status: Open	***601 S MAIN ST***	***SSE 1/4 - 1/2 (0.396 mi.)***	***N63***	***111***
FINGERLE LUMBER CO Facility Status: Closed	***202 E MADISON***	***SSE 1/4 - 1/2 (0.420 mi.)***	***71***	***122***

Lower Elevation	Address	Direction / Distance	Map ID	Page
ILLIS SERVICE Facility Status: Closed	***401 W HURON ST***	***NNW 0 - 1/8 (0.064 mi.)***	***14***	***26***
BILL MUNCYS SERVICE Facility Status: Closed	***423 MILLER AVE***	***N 1/8 - 1/4 (0.213 mi.)***	***J42***	***78***
DALE KRULL CONST Facility Status: Closed	***221 FELCH ST***	***N 1/4 - 1/2 (0.402 mi.)***	***P65***	***114***
C.B DEVELOPMENT Facility Status: Closed	***220 FELCH ST***	***NNE 1/4 - 1/2 (0.409 mi.)***	***P69***	***120***

EXECUTIVE SUMMARY

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environmental Quality's Michigan UST database.

A review of the UST list, as provided by EDR, and dated 11/05/2012 has revealed that there are 10 UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MODERN CAR WASH	318 W LIBERTY ST	SSE 0 - 1/8 (0.006 mi.)	B9	18
J B'S AUTO SERVICE	325 WEST LIBERTY ST	SSE 0 - 1/8 (0.008 mi.)	B10	19
ANN ARBOR IMPLEMENT CO	***210 S 1ST ST***	***ESE 0 - 1/8 (0.041 mi.)***	***12***	***23***
WCP INVESTMENTS PARTNERSHIP	***117 N FIRST ST***	***NE 0 - 1/8 (0.090 mi.)***	***D19***	***34***
BUDGET RENT A CAR	***200 S ASHLEY ST***	***E 0 - 1/8 (0.103 mi.)***	***E22***	***39***
RO-AN REALTY CO	218-220 W HURON ST	ENE 0 - 1/8 (0.117 mi.)	F26	44
ASHLEY TERRANCE DEVELOPMENT	***208 WEST HURON STREET***	***NE 1/8 - 1/4 (0.130 mi.)***	***F29***	***48***
EMRE FUEL INC	***402 S MAIN ST***	***SE 1/8 - 1/4 (0.183 mi.)***	***38***	***69***
MAIN STREET GAS STATION	***428 SOUTH MAIN***	***SSE 1/8 - 1/4 (0.233 mi.)***	***K44***	***81***

Lower Elevation	Address	Direction / Distance	Map ID	Page
BILL MUNCYS SERVICE	***423 MILLER AVE***	***N 1/8 - 1/4 (0.213 mi.)***	***J42***	***78***

State and tribal institutional control / engineering control registries

AUL: A listing of sites with institutional and/or engineering controls in place.

A review of the AUL list, as provided by EDR, and dated 03/28/2012 has revealed that there are 3 AUL sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
DE LONG BBQ PIT	***314 DETROIT ST***	***NE 1/4 - 1/2 (0.366 mi.)***	***58***	***103***
FINGERLE LUMBER CO	617 SOUTH FIFTH AVENUE	SSE 1/4 - 1/2 (0.463 mi.)	72	124

Lower Elevation	Address	Direction / Distance	Map ID	Page
BILL MUNCYS SERVICE	423 MILLER AVE.	N 1/8 - 1/4 (0.213 mi.)	J41	77

State and tribal Brownfields sites

BROWNFIELDS: Brownfields and USTfield Site Database.

A review of the BROWNFIELDS list, as provided by EDR, and dated 07/27/2012 has revealed that there is 1 BROWNFIELDS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ARMEN CLEANERS	***630 S. ASHLEY STREET***	***SSE 1/4 - 1/2 (0.406 mi.)***	***O67***	***119***

EXECUTIVE SUMMARY

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: The EPA's listing of Brownfields properties from the Cleanups in My Community program, which provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

A review of the US BROWNFIELDS list, as provided by EDR, and dated 12/10/2012 has revealed that there are 2 US BROWNFIELDS sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
226 WEST LIBERTY	226 WEST LIBERTY	SE 0 - 1/8 (0.068 mi.)	C15	27
200 SOUTH ASHLEY STREET	200 SOUTH ASHLEY STREET	E 0 - 1/8 (0.103 mi.)	E24	40

Local Lists of Hazardous waste / Contaminated Sites

DEL SHWS: Sites that have been delisted or deleted from the List of Contaminated Sites.The available documentation for the site does support it's listing or the site no longer meets criteria specified in rules.

A review of the DEL SHWS list, as provided by EDR, and dated 11/08/2012 has revealed that there is 1 DEL SHWS site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MONTGOMERY PUMPING STATION	***432 MONTGOMERY***	***WSW 1/2 - 1 (0.582 mi.)***	***74***	***125***

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 09/11/2012 has revealed that there are 10 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ANN ARBOR YMCA	400 W WASHINGTON ST	E 0 - 1/8 (0.002 mi.)	A7	16
PAINTERS SUPPLY AND EQUIPMENT	***211 W LIBERTY ST***	***ESE 0 - 1/8 (0.077 mi.)***	***C18***	***33***
THERMO ANALYTICAL ENVR RESEACH	***117 N 1ST ST***	***NE 0 - 1/8 (0.090 mi.)***	***D20***	***35***
ASHLEY GROUP LLC	213-215 S ASHLEY ST	E 0 - 1/8 (0.102 mi.)	E21	37
RO AN REALITY CO	***208 W HURON ST***	***NE 1/8 - 1/4 (0.130 mi.)***	***F28***	***46***
WEST WASHINGTON STREET ASSOCIA	***112 W WASHINGTON ST***	***E 1/8 - 1/4 (0.157 mi.)***	***G33***	***62***
GREAT COPY CO	***110 E WASHINGTON ST***	***E 1/8 - 1/4 (0.173 mi.)***	***G37***	***68***
CITY OF ANN ARBOR	***111 N MAIN ST***	***ENE 1/8 - 1/4 (0.188 mi.)***	***I40***	***76***
2020 COMMUNICATIONS	106 N 4TH AVE	ENE 1/8 - 1/4 (0.249 mi.)	46	83

Lower Elevation	Address	Direction / Distance	Map ID	Page
ANN ARBOR CIRCUITS INC	***424 W WASHINGTON ST***	***W 0 - 1/8 (0.002 mi.)***	***A6***	***13***

EXECUTIVE SUMMARY

BEA: Baseline Environmental Assessment.

A review of the BEA list, as provided by EDR, and dated 11/26/2012 has revealed that there are 14 BEA sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	221 W LIBERTY ST	ESE 0 - 1/8 (0.072 mi.)	C16	32
Not reported	***200 S ASHLEY***	***E 0 - 1/8 (0.103 mi.)***	***E23***	***40***
Not reported	204 W HURON	NE 1/8 - 1/4 (0.130 mi.)	F27	46
Not reported	110 MILLER	NE 1/8 - 1/4 (0.237 mi.)	45	83
Not reported	507-511 S. ASHLEY	SSE 1/8 - 1/4 (0.249 mi.)	L47	85
A & L PARTS INC	***521 S ASHLEY***	***SSE 1/4 - 1/2 (0.266 mi.)***	***L49***	***88***
Not reported	502 S MAIN ST	SSE 1/4 - 1/2 (0.271 mi.)	K50	89
Not reported	551 S FOURTH	SSE 1/4 - 1/2 (0.362 mi.)	57	103
DE LONG BBQ PIT	***314 DETROIT ST***	***NE 1/4 - 1/2 (0.366 mi.)***	***58***	***103***
MAIN MADISON PROPERTIES	552 - 564 S MAIN ST	SSE 1/4 - 1/2 (0.366 mi.)	N59	106
CAMPUS AUTO	***202 S DIVISION ST***	***E 1/4 - 1/2 (0.387 mi.)***	***62***	***109***
Not reported	601 S MAIN	SSE 1/4 - 1/2 (0.396 mi.)	N64	114

Lower Elevation	Address	Direction / Distance	Map ID	Page
ANN ARBOR ART CTR (FORMER STAN	220 FELCH	NNE 1/4 - 1/2 (0.408 mi.)	P68	120
Not reported	220 FELCH STREET	NNE 1/4 - 1/2 (0.409 mi.)	P70	122

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

A review of the EDR MGP list, as provided by EDR, has revealed that there are 2 EDR MGP sites within approximately 1 mile of the target property.

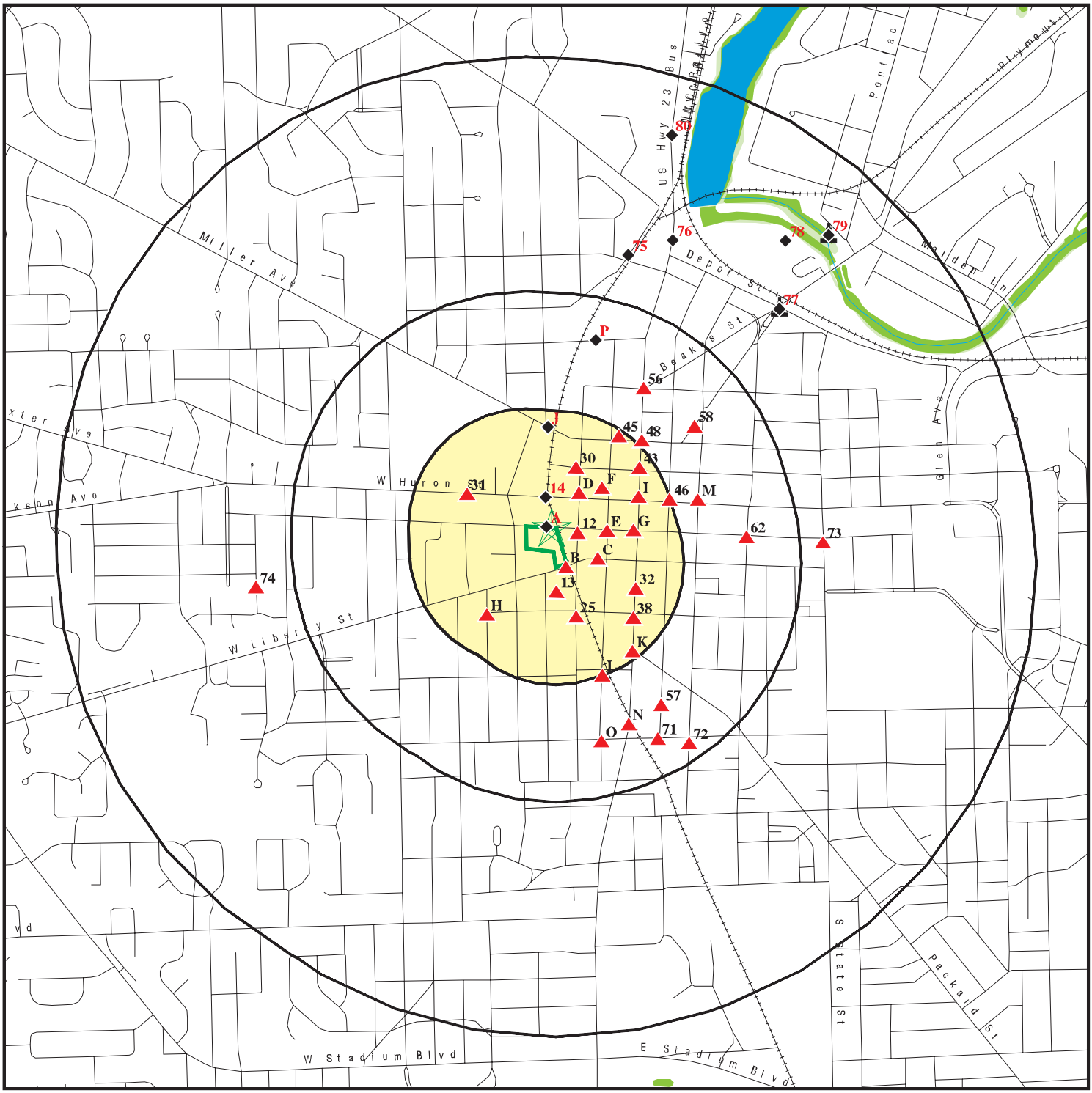
Lower Elevation	Address	Direction / Distance	Map ID	Page
CITY GAS WORKS	BEAKES STREET	NE 1/2 - 1 (0.666 mi.)	77	128
THE ANN ARBOR GAS CO	BROADWAY STREET	NE 1/2 - 1 (0.852 mi.)	79	129

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 27 records.

Site Name	Database(s)
BRIARWOOD SERVICE CENTER-AMOCO	AUL
HIDEAWAY LANE	SHWS
MICH CON BEAKES ST	SHWS
UNIV OF MICH HOSPITAL FULLER RD	SHWS
UM NORTH CAMPUS LANDFILL AREA	SHWS
AVFUEL BULK FACILITY	SHWS
UNIVERSITY OF MICH LF NO 1	SHWS
M14 ROLLOVER	CERCLIS
UNIVERSITY OF MICHIGAN LANDFILL #1	CERC-NFRAP
MADISON & MAIN STREETS	BROWNFIELDS
SHELL STATION	LUST, UST
MARATHON UNIT #1793	LUST, UST
ST JOSEPH MERCY HEALTH SYSTEM	LUST, UST
ANN ARBOR PIPE & SUPPLY	LUST, UST
LIBERTY STREET	UST
MI DEPT/NATURAL RESOURCES AND ENVI	RCRA NonGen / NLR
COUNTY OF WASHTENAW ROAD COMMISSI	RCRA NonGen / NLR
MI DEPT/TRANSPORTATION	RCRA NonGen / NLR, FINDS
401 WEST TOUHY AVENUE	HMIRS
WEST MICHIGAN MART DOCK MUSKEGON L	ERNS
PARCELS B & C	BEA
	BEA
UNKNOWN	BEA
	BEA
	BEA
EATON CORP - ANN ARBOR	BEA
	BEA

OVERVIEW MAP - 3493977.2s



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Oil & Gas pipelines from USGS

National Wetland Inventory

State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 415 West Washington ADDRESS: 415 W. Washington Ann Arbor MI 48103 LAT/LONG: 42.2806 / 83.7521	CLIENT: Tetra Tech GEO CONTACT: Joy Gryzenia INQUIRY #: 3493977.2s DATE: January 14, 2013 12:21 pm

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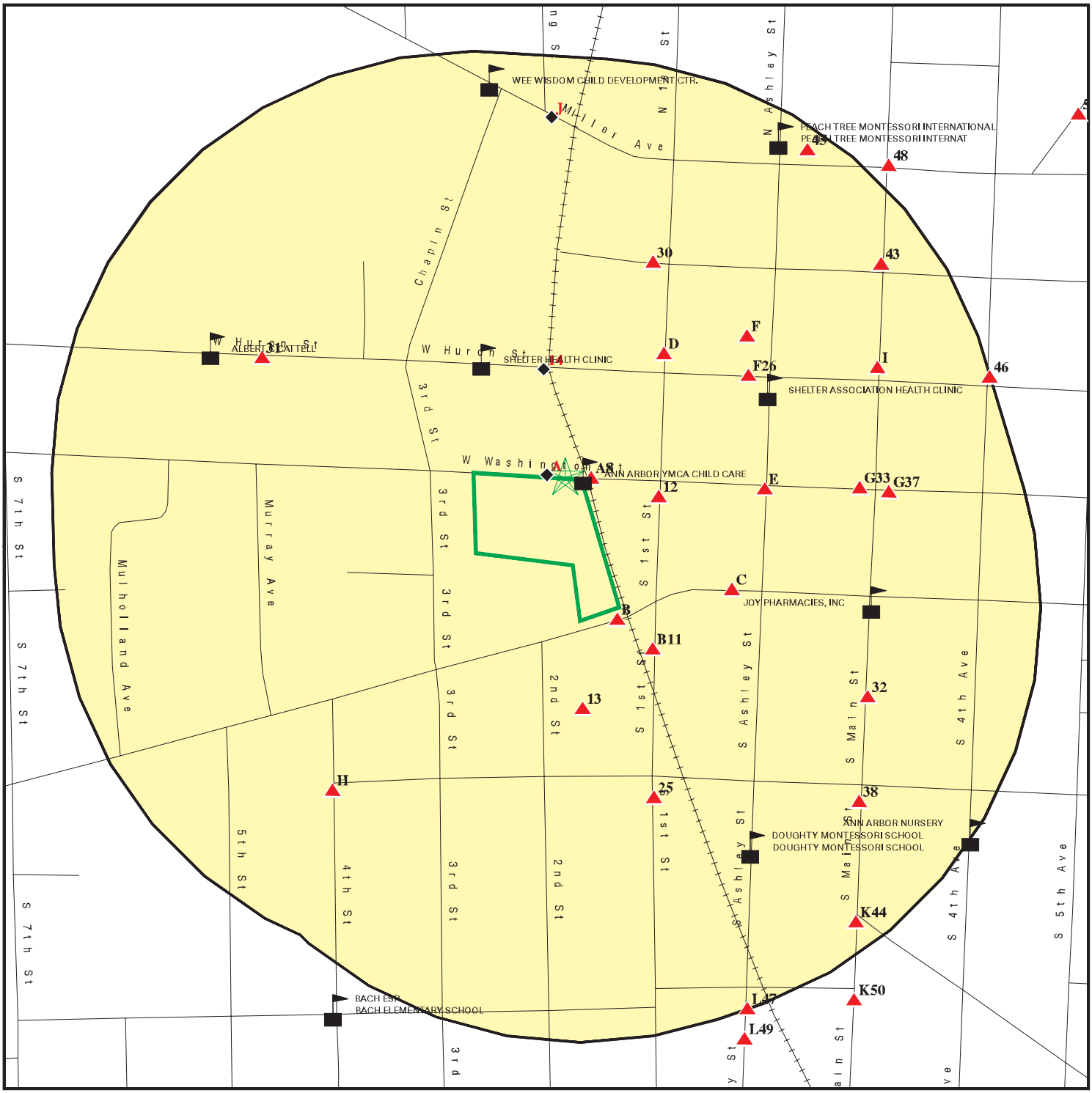
DETAIL MAP - 3493977.2s



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

Indian Reservations BIA

Oil & Gas pipelines from USGS

0 1/16 1/8 1/4 Miles

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 415 West Washington	CLIENT: Tetra Tech GEO
ADDRESS: 415 W. Washington Ann Arbor MI 48103	CONTACT: Joy Gryzenia
LAT/LONG: 42.2806 / 83.7521	INQUIRY #: 3493977.2s DATE: January 14, 2013 12:25 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS	0.500		0	0	1	NR	NR	1
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP	0.500		0	0	1	NR	NR	1
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		2	6	NR	NR	NR	8
Federal institutional controls / engineering controls registries								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	1.000		2	1	1	5	NR	9
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
WDS	TP	1	NR	NR	NR	NR	NR	1
State and tribal leaking storage tank lists								
LUST	0.500	1	5	5	15	NR	NR	26
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
UST	0.250	1	6	4	NR	NR	NR	11

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
AUL	0.500		0	1	2	NR	NR	3
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	1	NR	NR	1
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		2	0	0	NR	NR	2
Local Lists of Landfill / Solid Waste Disposal Sites								
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HIST LF	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	TP		NR	NR	NR	NR	NR	0
DEL SHWS	1.000		0	0	0	1	NR	1
CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
LIENS	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
SPILLS	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250	2	5	5	NR	NR	NR	12
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	0	0	NR	0
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
MINES	0.250		0	0	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
FINDS	TP	2	NR	NR	NR	NR	NR	2
RAATS	TP		NR	NR	NR	NR	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
AIRS	TP	1	NR	NR	NR	NR	NR	1
BEA	0.500		2	3	9	NR	NR	14
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	2	NR	2

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 **CITY OF ANN ARBOR REMED PMT 392 96** **AIRS S107702967**
Target **415 W WASHINGTON** **WDS N/A**
Property **ANN ARBOR, MI 48107**

Site 1 of 8 in cluster A

Actual:
809 ft.

AIRS:

EI Year:	1996
State Registration Number:	N5977
Naics Code:	Not reported
Contact Name:	Not reported
Contact Phone:	Not reported
Contact Address:	Not reported
Contact City,St,Zip:	Not reported
Permit Number:	Not reported
Date Received:	Not reported
State Registration Number:	N5977
Country:	Not reported
Application Reason:	Not reported
Record Type:	Not reported
State County FIPS:	Not reported
Facility Category:	Not reported
SIC Primary:	4953
Tribal Code:	Not reported
Supplemental Location Text:	Not reported
Dun & Brad Street Number:	Not reported
Business Name:	CITY OF ANN ARBOR
Principal Product:	CLEAN SOIL, GW AND AIR USING BACT
Principal Product Description:	SVES FOR BTEX EMPACTED GW & SOILS
UTM Zone (Geo Coordinates Universal Transverse Mercator System):	16
UTM Horizontal Coord:	273000
UTM Vertical Coord:	4684420
Mailing Name:	CITY OF ANN ARBOR
Mailing Contact Person:	HOMAYOON PIROOZ PE
Mailing Street:	100 N FIFTH AVE PO BOX 8647
Mailing City:	ANN ARBOR
Mailing State:	MI
Mailing Zip:	48107
Mailing Zip 4 Extension:	8647
Compliance Person:	HOMAYOON PIROOZ PE
Compliance Area Code:	313
Compliance Phone Number:	9942744
Emission Inventory Contact Person:	FRANCIS J BIEHL EX 524
EI Contact Area Code:	810
EI Contact Phone Number:	5536322
Permit Contact Person:	HOMAYOON PIROOZ PE
Permit Contact Person Area Code:	313
Permit Contact Person Phone Number:	9942744
Federal Employer Id Number:	386004534
# Of Employees:	0
Reporting Year:	1996
Date Record Was Created:	1995-09-09 00:00:00

WDS:

Site Id:	MID985640275
WMD Id:	407030
Site Specific Name:	CITY OF ANN ARBOR PARKS SERVICE HEADQUARTERS
Mailing Address:	4251 STONE SCHOOL RD
Mailing City/State/Zip:	48108

CITY OF ANN ARBOR REMED PMT 392 96 (Continued) **S107702967**

Mailing County: WASHTENAW

Site Id: MIP200000776
WMD Id: 435876
Site Specific Name: CITY OF ANN ARBOR
Mailing Address: 415 W WASHINGTON ST
Mailing City/State/Zip: 48103
Mailing County: WASHTENAW

A2 Target Property **CITY OF ANN ARBOR**
415 W WASHINGTON ST
ANN ARBOR, MI 48103

RCRA NonGen / NLR **1007101781**
MIP200000776

Site 2 of 8 in cluster A

Actual: 809 ft.

RCRA NonGen / NLR:
Date form received by agency: 01/01/1980
Facility name: CITY OF ANN ARBOR
Facility address: 415 W WASHINGTON ST
ANN ARBOR, MI 48103
EPA ID: MIP200000776
Contact: MARK TUSSING
Contact address: 415 W WASHINGTON ST
ANN ARBOR, MI 48103
Contact country: US
Contact telephone: (000) 000-0000
Contact email: Not reported
EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: CITY OF ANN ARBOR
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Municipal
Owner/Operator Type: Operator
Owner/Op start date: 01/01/1970
Owner/Op end date: Not reported

Owner/operator name: CITY OF ANN ARBOR
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Municipal
Owner/Operator Type: Owner
Owner/Op start date: 01/01/1970
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No

CITY OF ANN ARBOR (Continued) **1007101781**

Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Hazardous Waste Summary:

Waste code:	D001
Waste name:	IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Violation Status:	No violations found

A3 Target Property **PARKS & RECREATION BLDG**
415 W WASHINGTON ST
ANN ARBOR, MI 48103

LUST U000266403
UST N/A

Site 3 of 8 in cluster A

Actual: 809 ft.

LUST:

Facility ID:	00008428
Source:	STATE OF MICHIGAN
Owner Name:	City of Ann Arbor
Owner Address:	PO Box 8647 100 N Fifth Ave
Owner City,St,Zip:	Ann Arbor, MI 48107
Owner Contact:	Not reported
Owner Phone:	(734) 794-6000
Country:	USA
District:	Jackson District Office
Site Name:	Parks & Recreation Bldg
Latitude:	42.28043
Longitude:	-83.75225
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0371-92
Release Date:	03/06/1992
Substance Released:	Gasoline
Release Status:	Open
Release Closed Date:	Not reported
Leak Number:	C-0549-89

PARKS & RECREATION BLDG (Continued) **U000266403**

Release Date: 09/19/1989
Substance Released: Not reported
Release Status: Open
Release Closed Date: Not reported

Leak Number: C-1222-89
Release Date: 12/20/1989
Substance Released: Not reported
Release Status: Open
Release Closed Date: Not reported

UST:
Facility ID: 00008428
Facility Type: CLOSED
Latitude: 42.28043
Longitude: -83.75225
Owner Name: CITY OF ANN ARBOR
Owner Address: PO BOX 8647 100 N FIFTH AVE
Owner City,St,Zip: ANN ARBOR, MI 48107
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (734) 794-6000
Contact: DANIEL J. CULLEN
Contact Phone: (734) 994-6696
Date of Collection: 01/11/2001
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Datum: NAD83
Source: STATE OF MICHIGAN
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)
Method of Collection: Address Matching-House Number

Tank ID: 1
Tank Status: Removed from Ground
Capacity: 6000
Install Date: 04/02/1982
Product: Gasoline
Remove Date: 02/19/1993
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Galvanized Steel
Piping Type: Suction: No Valve At Tank
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 2
Tank Status: Removed from Ground
Capacity: 6000
Install Date: 04/02/1982
Product: Gasoline
Remove Date: 02/19/1993
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Suction: No Valve At Tank
Construction Material: Asphalt Coated or Bare Steel

PARKS & RECREATION BLDG (Continued) **U000266403**

Impressed Device: No

Tank ID: 3
Tank Status: Removed from Ground
Capacity: 1000
Install Date: 04/02/1982
Product: Diesel
Remove Date: 12/19/1989
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

A4 **CITY OF ANN ARBOR** **RCRA NonGen / NLR** **1000691306**
Target **415 W WASHINGTON ST** **FINDS** **MID985640275**
Property **ANN ARBOR, MI 48103**

Site 4 of 8 in cluster A

Actual: 809 ft.

RCRA NonGen / NLR:
Date form received by agency: 04/08/2008
Facility name: CITY OF ANN ARBOR
Facility address: 415 W WASHINGTON ST
ANN ARBOR, MI 48103
EPA ID: MID985640275
Mailing address: 4251 STONE SCHOOL RD
ANN ARBOR, MI 48108
Contact: MICHAEL BERGREN
Contact address: 415 W WASHINGTON ST
ANN ARBOR, MI 48103
Contact country: US
Contact telephone: (734) 323-5618
Contact email: Not reported
EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 04/09/2008
Owner/Op end date: Not reported

Owner/operator name: NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private

CITY OF ANN ARBOR (Continued) **1000691306**

Owner/Operator Type: Owner
Owner/Op start date: 04/09/2008
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 10/01/2007
Facility name: CITY OF ANN ARBOR
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 06/11/2007
Facility name: CITY OF ANN ARBOR
Classification: Small Quantity Generator

Date form received by agency: 10/05/2002
Facility name: CITY OF ANN ARBOR
Classification: Small Quantity Generator

Date form received by agency: 04/07/1992
Facility name: CITY OF ANN ARBOR
Classification: Small Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110001300618

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource

CITY OF ANN ARBOR (Continued) **1000691306**

Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

A5
Target Property
Actual: 809 ft.

ANN ARBOR PARKS AND RECREATION
415 W WASHINGTON ST
ANN ARBOR, MI 48103

FINDS **1014733669**
N/A

Site 5 of 8 in cluster A

FINDS:

Registry ID: 110042382971

Environmental Interest/Information System

US National Pollutant Discharge Elimination System (NPDES) module of the Compliance Information System (ICIS) tracks surface water permits issued under the Clean Water Act. Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

A6
West
< 1/8
0.002 mi.
8 ft.

Relative: Lower

Actual: 808 ft.

ANN ARBOR CIRCUITS INC
424 W WASHINGTON ST
ANN ARBOR, MI 48103

RCRA NonGen / NLR **1000102250**
FINDS **MID020827192**

Site 6 of 8 in cluster A

RCRA NonGen / NLR:

Date form received by agency:	08/21/2002
Facility name:	ANN ARBOR CIRCUITS INC
Facility address:	424 W WASHINGTON ST ANN ARBOR, MI 48103
EPA ID:	MID020827192
Contact:	F ABBOTT BROWN
Contact address:	424 W WASHINGTON ST ANN ARBOR, MI 48103
Contact country:	US
Contact telephone:	(313) 665-1444
Contact email:	Not reported
EPA Region:	05
Land type:	Other land type
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported

ANN ARBOR CIRCUITS INC (Continued) **1000102250**

Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 12/22/2002
Owner/Op end date: Not reported

Owner/operator name: NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 12/22/2002
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 12/21/2000
Facility name: ANN ARBOR CIRCUITS INC
Classification: Not a generator, verified

Date form received by agency: 02/18/1997
Facility name: ANN ARBOR CIRCUITS INC
Classification: Small Quantity Generator

Date form received by agency: 02/12/1990
Facility name: ANN ARBOR CIRCUITS INC
Classification: Large Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

ANN ARBOR CIRCUITS INC (Continued) **1000102250**

Facility Has Received Notices of Violations:
- Regulation violated: Not reported
- Area of violation: Generators - Pre-transport
- Date violation determined: 02/05/1997
- Date achieved compliance: 04/30/1997
- Violation lead agency: State
  - Enforcement action: WRITTEN INFORMAL
  - Enforcement action date: 02/05/1997
  - Enf. disposition status: Not reported
  - Enf. disp. status date: Not reported
  - Enforcement lead agency: State
  - Proposed penalty amount: 0
  - Final penalty amount: 0
  - Paid penalty amount: 0

- Regulation violated: Not reported
- Area of violation: Generators - General
- Date violation determined: 10/31/1988
- Date achieved compliance: 02/07/1989
- Violation lead agency: State
  - Enforcement action: Not reported
  - Enforcement action date: Not reported
  - Enf. disposition status: Not reported
  - Enf. disp. status date: Not reported
  - Enforcement lead agency: Not reported
  - Proposed penalty amount: 0
  - Final penalty amount: 0
  - Paid penalty amount: 0

- Regulation violated: Not reported
- Area of violation: Generators - General
- Date violation determined: 09/20/1988
- Date achieved compliance: 02/07/1989
- Violation lead agency: State
  - Enforcement action: WRITTEN INFORMAL
  - Enforcement action date: 09/20/1988
  - Enf. disposition status: Not reported
  - Enf. disp. status date: Not reported
  - Enforcement lead agency: State
  - Proposed penalty amount: 0
  - Final penalty amount: 0
  - Paid penalty amount: 0

Evaluation Action Summary:
- Evaluation date: 04/30/1997
- Evaluation: FOLLOW-UP INSPECTION
- Area of violation: Not reported
- Date achieved compliance: Not reported
- Evaluation lead agency: State

- Evaluation date: 02/05/1997
- Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
- Area of violation: Generators - Pre-transport
- Date achieved compliance: 04/30/1997
- Evaluation lead agency: State

ANN ARBOR CIRCUITS INC (Continued) **1000102250**

Evaluation date: 02/07/1989
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 10/31/1988
Evaluation: COMPLIANCE SCHEDULE EVALUATION
Area of violation: Generators - General
Date achieved compliance: 02/07/1989
Evaluation lead agency: State

Evaluation date: 09/14/1988
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 02/07/1989
Evaluation lead agency: State

FINDS:

Registry ID: 110002117236

Environmental Interest/Information System

US EPA TRIS (Toxics Release Inventory System) contains information from facilities on the amounts of over 300 listed toxic chemicals that these facilities release directly to air, water, land, or that are transported off-site.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

A7 **ANN ARBOR YMCA** **RCRA NonGen / NLR** **1008880911**
East **400 W WASHINGTON ST** **MIK356241422**
< 1/8 **ANN ARBOR, MI 48103**
0.002 mi.
10 ft. **Site 7 of 8 in cluster A**

Relative:
Higher

Actual:
811 ft.

RCRA NonGen / NLR:
Date form received by agency: 10/31/2005
Facility name: ANN ARBOR YMCA
Facility address: 400 W WASHINGTON ST
ANN ARBOR, MI 48103
EPA ID: MIK356241422
Contact: RICHARD ANDERSON
Contact address: 400 W WASHINGTON ST
ANN ARBOR, MI 48103
Contact country: US
Contact telephone: (734) 661-8057
Contact email: Not reported
EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

ANN ARBOR YMCA (Continued) **1008880911**

Owner/Operator Summary:

Owner/operator name:	ANN ARBOR YMCA
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	04/01/2005
Owner/Op end date:	Not reported

Owner/operator name:	ANN ARBOR YMCA
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	04/01/2005
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Hazardous Waste Summary:

Waste code:	D001
Waste name:	IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

A8
East
< 1/8
0.006 mi.
31 ft.

396-424 W. WASHINGTON/ANNARBOR YMCA — **SHWS** — **S110126804**
396-424 W. WASHINGTON ST. — **N/A**
ANN ARBOR, MI 48103

Site 8 of 8 in cluster A

Relative:
Higher

Actual:
812 ft.

SHWS:

Facility ID:	81000555
Facility Status:	**Evaluation conducted**
Source:	Not reported
SAM Score:	36
SAM Score Date:	05/31/2005
Township:	02S
Range:	06E
Section:	29
Quarter:	Not reported
Quarter/Quarter:	Not reported
Pollutants:	Not reported

B9
SSE
< 1/8
0.006 mi.
32 ft.

MODERN CAR WASH — **UST** — **U002303306**
318 W LIBERTY ST — **N/A**
ANN ARBOR, MI 48103

Site 1 of 3 in cluster B

Relative:
Higher

Actual:
817 ft.

UST:

Facility ID:	00016297
Facility Type:	CLOSED
Latitude:	42.27948
Longitude:	-83.75158
Owner Name:	DONALD DEWHIRST
Owner Address:	3496 DALEVIEW DR
Owner City,St,Zip:	ANN ARBOR, MI 48105-9686
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(313) 323-7994
Contact:	DONALD DEWHIRST
Contact Phone:	(734) 995-0117
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number
Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	1000
Install Date:	04/25/1966
Product:	Gasoline
Remove Date:	11/13/1995
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel
Impressed Device:	No

MODERN CAR WASH (Continued) **U002303306**

Tank ID: 2
Tank Status: Removed from Ground
Capacity: 600
Install Date: 01/01/1966
Product: Gasoline
Remove Date: 11/13/1995
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Unknown
Impressed Device: No

B10 **J B'S AUTO SERVICE** **UST** **U004192816**
SSE **325 WEST LIBERTY ST** **N/A**
< 1/8 **ANN ARBOR, MI 48103**
0.008 mi.
42 ft. **Site 2 of 3 in cluster B**

Relative: Higher
Actual: 817 ft.

UST 2:
Owner Name: OWNER ADDRESS UNKNOWN
Owner Address: Not reported
Active Tanks: 3

B11 **GT PRODUCTS INC** **RCRA-CESQG** **1000128636**
SSE **315 S. 1ST ST.** **FINDS** **MID044256089**
< 1/8 **ANN ARBOR, MI 48104**
0.031 mi.
166 ft. **Site 3 of 3 in cluster B**

Relative: Higher
Actual: 820 ft.

RCRA-CESQG:
Date form received by agency: 06/06/2006
Facility name: MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Facility address: 315 S 1ST ST
ANN ARBOR, MI 48104
EPA ID: MID044256089
Mailing address: 223 W ERIE ST
CHICAGO, IL 60610
Contact: RONALD MUCHA
Contact address: 315 S 1ST ST
ANN ARBOR, MI 48104
Contact country: US
Contact telephone: (312) 280-7770
Contact email: Not reported
EPA Region: 05
Land type: Private
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely

GT PRODUCTS INC (Continued) **1000128636**

hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	12/01/2004
Owner/Op end date:	Not reported

Owner/operator name:	MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	12/01/2004
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency:	03/01/2006
Facility name:	MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Site name:	EATON CORPORATION
Classification:	Not a generator, verified

Date form received by agency:	06/15/2005
Facility name:	MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Classification:	Not a generator, verified

Date form received by agency:	05/06/2004
Facility name:	MORNINGSIDE ANN ARBOR COMMERCIAL LLC

GT PRODUCTS INC (Continued) **1000128636**

Classification: Large Quantity Generator

Date form received by agency: 03/01/2004
Facility name: MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Site name: EATON CORPORATION
Classification: Large Quantity Generator

Date form received by agency: 06/10/2003
Facility name: MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Classification: Large Quantity Generator

Date form received by agency: 05/15/2002
Facility name: MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Classification: Large Quantity Generator

Date form received by agency: 03/01/2002
Facility name: MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Site name: EATON CORPORATION
Classification: Large Quantity Generator

Date form received by agency: 03/05/2001
Facility name: MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Classification: Large Quantity Generator

Date form received by agency: 03/23/1998
Facility name: MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Classification: Small Quantity Generator

Date form received by agency: 11/19/1980
Facility name: MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Classification: Not a generator, verified

Date form received by agency: 08/18/1980
Facility name: MORNINGSIDE ANN ARBOR COMMERCIAL LLC
Classification: Large Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Facility Has Received Notices of Violations:
Regulation violated: FR - 265.54(d)
Area of violation: Generators - General
Date violation determined: 08/20/2003
Date achieved compliance: 01/29/2004
Violation lead agency: EPA
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 12/17/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported

GT PRODUCTS INC (Continued) **1000128636**

Enforcement lead agency: EPA
Proposed penalty amount: 0
Final penalty amount: 0
Paid penalty amount: 0

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 03/04/1998
Date achieved compliance: 04/08/1999
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/04/1998
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: 0
Final penalty amount: 0
Paid penalty amount: 0

Regulation violated: Not reported
Area of violation: LDR - General
Date violation determined: 02/27/1998
Date achieved compliance: 04/08/1999
Violation lead agency: EPA
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/04/1998
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: 0
Final penalty amount: 0
Paid penalty amount: 0

Evaluation Action Summary:
Evaluation date: 08/20/2003
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 01/29/2004
Evaluation lead agency: EPA

Evaluation date: 02/27/1998
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: LDR - General
Date achieved compliance: 04/08/1999
Evaluation lead agency: EPA

Evaluation date: 02/27/1998
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 04/08/1999
Evaluation lead agency: State

FINDS:

Registry ID: 110002117245

Environmental Interest/Information System

GT PRODUCTS INC (Continued) **1000128636**

NCDB (National Compliance Data Base) supports implementation of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TSCA). The system tracks inspections in regions and states with cooperative agreements, enforcement actions, and settlements.

US EPA TRIS (Toxics Release Inventory System) contains information from facilities on the amounts of over 300 listed toxic chemicals that these facilities release directly to air, water, land, or that are transported off-site.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

HAZARDOUS WASTE BIENNIAL REPORTER

12
ESE
< 1/8
0.041 mi.
218 ft.

ANN ARBOR IMPLEMENT CO **LUST U000715216**
210 S 1ST ST **UST N/A**
ANN ARBOR, MI 48104 **WDS**

Relative:
Higher

Actual:
821 ft.

LUST:

Facility ID:	00035555
Source:	STATE OF MICHIGAN
Owner Name:	Ann Arbor Implement Co
Owner Address:	3614 Windwheel Pt
Owner City,St,Zip:	Pinckney, MI 48169-8437
Owner Contact:	Not reported
Owner Phone:	(734) 663-2495
Country:	USA
District:	Jackson District Office
Site Name:	Ann Arbor Implement
Latitude:	42.28031
Longitude:	-83.75120
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0744-93
Release Date:	06/11/1993
Substance Released:	Gasoline
Release Status:	Closed
Release Closed Date:	10/06/1993

UST:

Facility ID:	00035555
Facility Type:	CLOSED
Latitude:	42.28031

ANN ARBOR IMPLEMENT CO (Continued) **U000715216**

Longitude:	-83.75120
Owner Name:	ANN ARBOR IMPLEMENT CO
Owner Address:	3614 WINDWHEEL PT
Owner City,St,Zip:	PINCKNEY, MI 48169-8437
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(734) 663-2495
Contact:	PAUL E. LOHR
Contact Phone:	(734) 663-2495
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number

Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	1000
Install Date:	01/01/1976
Product:	Gasoline
Remove Date:	06/11/1993
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Galvanized Steel
Piping Type:	Suction: Valve at Tank
Construction Material:	Asphalt Coated or Bare Steel
Impressed Device:	No

WDS:

Site Id:	MIG000040501
WMD Id:	417046
Site Specific Name:	ANN ARBOR IMPLEMENT
Mailing Address:	210 S 1ST ST
Mailing City/State/Zip:	48104
Mailing County:	WASHTENAW

13
South
< 1/8
0.052 mi.
273 ft.

MORNINGSIDE ANN ARBOR LLC **RCRA-CESQG** **1010564624**
305 W LIBERTY ST **MIK784869687**
ANN ARBOR, MI 48103

Relative:
Higher

Actual:
819 ft.

RCRA-CESQG:

Date form received by agency:	04/06/2007
Facility name:	MORNINGSIDE ANN ARBOR LLC
Facility address:	305 W LIBERTY ST ANN ARBOR, MI 48103
EPA ID:	MIK784869687
Mailing address:	202 E WASHINGTON ST ANN ARBOR, MI 48104
Contact:	RONALD MUCHA
Contact address:	305 W LIBERTY ST ANN ARBOR, MI 48103
Contact country:	US

MORNINGSIDE ANN ARBOR LLC (Continued) **1010564624**

Contact telephone: (734) 761-8449
Contact email: Not reported
EPA Region: 05
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: MORNINGSIDE ANN ARBOR LLC
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 12/01/2004
Owner/Op end date: Not reported

Owner/operator name: MORNINGSIDE ANN ARBOR LLC
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 12/01/2004
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

MORNINGSIDE ANN ARBOR LLC (Continued) **1010564624**

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

14
NNW
< 1/8
0.064 mi.
338 ft.

ILLIS SERVICE **LUST 1000951246**
401 W HURON ST **WDS N/A**
ANN ARBOR, MI 48103

Relative:
Lower

Actual:
800 ft.

LUST:
Facility ID: 50001678
Source: STATE OF MICHIGAN
Owner Name: Nrt Owner
Owner Address: Unknown
Owner City,St,Zip: Unknown, MI 99999
Owner Contact: Not reported
Owner Phone: Not reported
Country: USA
District: Jackson District Office
Site Name: Illi's Service
Latitude: 42.28138
Longitude: -83.75292
Date of Collection: 01/11/2001
Method of Collection: Address Matching-House Number
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)

Leak Number: C-0445-85
Release Date: 10/06/1988
Substance Released: Not reported
Release Status: Closed
Release Closed Date: 08/08/1994

WDS:
Site Id: MIG000020521
WMD Id: 453032
Site Specific Name: ILLIS AUTO SERVICE
Mailing Address: 401 W HURON ST
Mailing City/State/Zip: 48103
Mailing County: WASHTENAW

C15
SE
< 1/8
0.068 mi.
358 ft.

226 WEST LIBERTY
226 WEST LIBERTY
ANN ARBOR, MI 48104

Site 1 of 4 in cluster C

US BROWNFIELDS **1009806364**
N/A

Relative:
Higher

Actual:
827 ft.

US BROWNFIELDS:

Recipient name:	Washtenaw County
Grant type:	Assessment
Property name:	226 WEST LIBERTY
Property #:	09-09-29-224-002
Parcel size:	0.2
Property Description:	Mainly an Auto Repair and Body Shop
Latitude:	42.2799
Longitude:	-83.75088
HCM label:	Not reported
Map scale:	Not reported
Point of reference:	Not reported
Datum:	North American Datum of 1983
ACRES property ID:	37481
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	6275
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	Not reported
Cleanup funding entity:	Not reported
Grant type:	P
Accomplishment type:	Phase II Environmental Assessment
Accomplishment count:	0
Cooperative agreement #:	96583901
Ownership entity:	Private
Current owner:	Dr. Gui Ponce de Leon
Did owner change:	N
Cleanup required:	Yes
Video available:	No
Photo available:	Yes
Institutional controls required:	N
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	No
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported

226 WEST LIBERTY (Continued) **1009806364**

Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Y
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Not reported
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
Unknown found:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	0.2
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	0.2
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported

Recipient name:	Washtenaw County
Grant type:	Assessment
Property name:	226 WEST LIBERTY
Property #:	09-09-29-224-002
Parcel size:	0.2
Property Description:	Mainly an Auto Repair and Body Shop
Latitude:	42.2799
Longitude:	-83.75088
HCM label:	Not reported
Map scale:	Not reported
Point of reference:	Not reported
Datum:	North American Datum of 1983
ACRES property ID:	37481
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported

226 WEST LIBERTY (Continued) **1009806364**

Cleanup funding source:	Not reported
Assessment funding:	5525
Assessment funding source:	Private/Other Funding
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	PMA Consultants, LLC
Cleanup funding entity:	Not reported
Grant type:	P
Accomplishment type:	Phase II Environmental Assessment
Accomplishment count:	0
Cooperative agreement #:	96583901
Ownership entity:	Private
Current owner:	Dr. Gui Ponce de Leon
Did owner change:	N
Cleanup required:	Yes
Video available:	No
Photo available:	Yes
Institutional controls required:	N
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	No
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Y
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Not reported
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported

226 WEST LIBERTY (Continued) **1009806364**

Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
Unknown found:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	0.2
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	0.2
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported

Recipient name:	Washtenaw County
Grant type:	Assessment
Property name:	226 WEST LIBERTY
Property #:	09-09-29-224-002
Parcel size:	0.2
Property Description:	Mainly an Auto Repair and Body Shop
Latitude:	42.2799
Longitude:	-83.75088
HCM label:	Not reported
Map scale:	Not reported
Point of reference:	Not reported
Datum:	North American Datum of 1983
ACRES property ID:	37481
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	1500
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	Not reported
Cleanup funding entity:	Not reported
Grant type:	P
Accomplishment type:	Phase I Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	96583901
Ownership entity:	Private
Current owner:	Dr. Gui Ponce de Leon
Did owner change:	N
Cleanup required:	Yes
Video available:	No
Photo available:	Yes
Institutional controls required:	N
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported

226 WEST LIBERTY (Continued) **1009806364**

IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	No
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Y
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Not reported
Petro products cleaned:	Not reported
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Not reported
Soil cleaned up:	Not reported
Surface water cleaned:	Not reported
Unknown found:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	0.2
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	0.2
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported

C16
ESE
< 1/8
0.072 mi.
382 ft.

Relative:
Higher

Actual:
827 ft.

BEA S106521766
N/A

221 W LIBERTY ST
ANN ARBOR CITY, MI 48103

Site 2 of 4 in cluster C

BEA:

Secondary Address:	Not reported
BEA Number:	564
District:	Jackson
Date Received:	08/04/2004
Submitter Name:	221 West Liberty, L.L.C.
Petition Determination:	Affirmed
Petition Disclosure:	1
Category:	No Hazardous Substance(s)
Determination 20107A:	Pending
Reviewer:	englishc
Division Assigned:	Storage Tank Division

C17
ESE
< 1/8
0.072 mi.
382 ft.

Relative:
Higher

Actual:
827 ft.

LUST S108986888
N/A

LIBERTY STREET
221 W LIBERTY
ANN ARBOR, MI 99999

Site 3 of 4 in cluster C

LUST:

Facility ID:	50005381
Source:	STATE OF MICHIGAN
Owner Name:	OWNER ADDRESS UNKNOWN
Owner Address:	Not Recorded
Owner City,St,Zip:	Not Recorded, XX 99999
Owner Contact:	Not reported
Owner Phone:	Not reported
Country:	USA
District:	Jackson District Office
Site Name:	Liberty Street
Latitude:	42.27939
Longitude:	-83.75013
Date of Collection:	Not reported
Method of Collection:	Interpolation-Map
Accuracy:	15
Accuracy Value Unit:	METERS
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Not reported
Leak Number:	C-0534-04
Release Date:	07/13/2004
Substance Released:	Not reported
Release Status:	Open
Release Closed Date:	Not reported

C18 **PAINTERS SUPPLY AND EQUIPMENT CO** **RCRA NonGen / NLR** **1004724985**
ESE **211 W LIBERTY ST** **FINDS** **MIR000022046**
< 1/8 **ANN ARBOR, MI 48104**
0.077 mi.
407 ft. **Site 4 of 4 in cluster C**

Relative:
Higher

Actual:
828 ft.

RCRA NonGen / NLR:

Date form received by agency:	06/09/2003
Facility name:	PAINTERS SUPPLY AND EQUIPMENT CO
Facility address:	211 W LIBERTY ST ANN ARBOR, MI 48104
EPA ID:	MIR000022046
Mailing address:	PO BOX 1477 TAYLOR, MI 48180
Contact:	DONALD WITT
Contact address:	211 W LIBERTY ST ANN ARBOR, MI 48104
Contact country:	US
Contact telephone:	(313) 946-1282
Contact email:	Not reported
EPA Region:	05
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	06/10/2003
Owner/Op end date:	Not reported

Owner/operator name:	NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	06/10/2003
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No

PAINTERS SUPPLY AND EQUIPMENT CO (Continued) **1004724985**

Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 03/03/1997
Facility name: PAINTERS SUPPLY AND EQUIPMENT CO
Classification: Conditionally Exempt Small Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110003700086

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

D19 **WCP INVESTMENTS PARTNERSHIP** **LUST U000714759**
NE **117 N FIRST ST** **UST N/A**
< 1/8 **ANN ARBOR, MI 48104**
0.090 mi.
474 ft. **Site 1 of 2 in cluster D**

Relative:
Higher

Actual:
819 ft.

LUST:
Facility ID: 00035012
Source: STATE OF MICHIGAN
Owner Name: Wcp Investments Partnership
Owner Address: 425 N Main St
Owner City,St,Zip: Ann Arbor, MI 48104-1157
Owner Contact: Not reported
Owner Phone: (734) 663-3213
Country: USA
District: Jackson District Office
Site Name: Wcp Investments Partnership
Latitude: 42.28171
Longitude: -83.75113
Date of Collection: 01/11/2001
Method of Collection: Address Matching-House Number
Accuracy: 100
Accuracy Value Unit: FEET

WCP INVESTMENTS PARTNERSHIP (Continued) **U000714759**

Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)

Leak Number: C-3069-91
Release Date: 03/19/1991
Substance Released: Unknown
Release Status: Closed
Release Closed Date: 08/06/1993

UST:
Facility ID: 00035012
Facility Type: CLOSED
Latitude: 42.28171
Longitude: -83.75113
Owner Name: WCP INVESTMENTS PARTNERSHIP
Owner Address: 425 N MAIN ST
Owner City,St,Zip: ANN ARBOR, MI 48104-1157
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (734) 663-3213
Contact: THOMAS PORTER
Contact Phone: (734) 663-3213
Date of Collection: 01/11/2001
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Datum: NAD83
Source: STATE OF MICHIGAN
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)
Method of Collection: Address Matching-House Number

Tank ID: 1
Tank Status: Removed from Ground
Capacity: 15000
Install Date: Not reported
Product: UNK
Remove Date: 07/06/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel,Unknown
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel,Unknown
Impressed Device: No

D20 **THERMO ANALYTICAL ENVR RESEACH GROUP** **RCRA NonGen / NLR** **1000364973**
NE **117 N 1ST ST** **FINDS** **MID981961550**
< 1/8 **ANN ARBOR, MI 48104**
0.090 mi.
474 ft. **Site 2 of 2 in cluster D**

Relative:
Higher

Actual:
819 ft.

RCRA NonGen / NLR:
Date form received by agency: 08/24/1987
Facility name: THERMO ANALYTICAL ENVR RESEACH GROUP
Facility address: 117 N 1ST ST
ANN ARBOR, MI 48104
EPA ID: MID981961550
Contact: JOSEPH HNATOW

THERMO ANALYTICAL ENVR RESEACH GROUP (Continued) **1000364973**

Contact address: 117 N 1ST ST
ANN ARBOR, MI 48104
Contact country: US
Contact telephone: (313) 662-3104
Contact email: Not reported
EPA Region: 05
Land type: Other land type
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 01/03/1970
Owner/Op end date: Not reported

Owner/operator name: NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 01/03/1970
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT

THERMO ANALYTICAL ENVR RESEACH GROUP (Continued) **1000364973**

WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Facility Has Received Notices of Violations:
- Regulation violated: Not reported
- Area of violation: Generators - General
- Date violation determined: 07/14/1987
- Date achieved compliance: 08/27/1987
- Violation lead agency: State
  - Enforcement action: WRITTEN INFORMAL
  - Enforcement action date: 07/31/1987
  - Enf. disposition status: Not reported
  - Enf. disp. status date: Not reported
  - Enforcement lead agency: State
  - Proposed penalty amount: 0
  - Final penalty amount: 0
  - Paid penalty amount: 0

Evaluation Action Summary:
- Evaluation date: 07/14/1987
- Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
- Area of violation: Generators - General
- Date achieved compliance: 08/27/1987
- Evaluation lead agency: State

FINDS:

Registry ID: 110003626470

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

E21
East
< 1/8
0.102 mi.
540 ft.

ASHLEY GROUP LLC **RCRA NonGen / NLR** **1007101146**
213-215 S ASHLEY ST **MIK939489498**
ANN ARBOR, MI 48104

Site 1 of 4 in cluster E

Relative:
Higher

Actual:
833 ft.

RCRA NonGen / NLR:
- Date form received by agency: 11/20/2001
- Facility name: ASHLEY GROUP LLC
- Facility address: 213-215 S ASHLEY ST
  ANN ARBOR, MI 48104
- EPA ID: MIK939489498
- Mailing address: 121 PEARL ST
  YPSILANTI, MI 48197
- Contact: BILL KINLEY
- Contact address: 213-215 S ASHLEY ST
  ANN ARBOR, MI 48104
- Contact country: US
- Contact telephone: (734) 487-9640
- Contact email: Not reported

ASHLEY GROUP LLC (Continued) **1007101146**

EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: ASHLEY GROUP LLC
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 11/20/2001
Owner/Op end date: Not reported

Owner/operator name: ASHLEY GROUP LLC
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 11/20/2001
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

E22 **BUDGET RENT A CAR** **LUST U001148628**
East **200 S ASHLEY ST** **UST N/A**
< 1/8 **ANN ARBOR, MI 48104**
0.103 mi.
543 ft. **Site 2 of 4 in cluster E**

Relative:
Higher

Actual:
833 ft.

LUST:

Facility ID:	00037272
Source:	STATE OF MICHIGAN
Owner Name:	Budget Rent A Car System Inc
Owner Address:	4225 Naperville Rd
Owner City,St,Zip:	Lisle, IL 60532
Owner Contact:	Not reported
Owner Phone:	(630) 955-7203
Country:	USA
District:	Jackson District Office
Site Name:	Budget Rent-a-car
Latitude:	42.28033
Longitude:	-83.75003
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0508-93
Release Date:	04/28/1993
Substance Released:	Gasoline
Release Status:	Closed
Release Closed Date:	08/05/1993

UST:

Facility ID:	00037272
Facility Type:	CLOSED
Latitude:	42.28033
Longitude:	-83.75003
Owner Name:	BUDGET RENT A CAR SYSTEM INC
Owner Address:	4225 NAPERVILLE RD
Owner City,St,Zip:	LISLE, IL 60532
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(630) 955-7203
Contact:	DAVID MCDONALD
Contact Phone:	(734) 941-8198
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number
Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	6000
Install Date:	04/01/1988
Product:	Gasoline,8

BUDGET RENT A CAR (Continued) **U001148628**

Remove Date: 04/28/1993
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Pressure
Construction Material: Double Walled,Fiberglass Reinforced plastic
Impressed Device: No

E23 **BEA S108414364**
East **200 S ASHLEY** **WDS N/A**
< 1/8 **ANN ARBOR CITY, MI 48104**
0.103 mi.
543 ft. **Site 3 of 4 in cluster E**

Relative:
Higher

Actual:
833 ft.

BEA:
Secondary Address: Not reported
BEA Number: 803
District: Jackson
Date Received: 03/01/2007
Submitter Name: Tierra Equities
Petition Determination: Affirmed
Petition Disclosure: 1
Category: No Hazardous Substance(s)
Determination 20107A: Affirmed
Reviewer: katkov
Division Assigned: Environmental Response Division

WDS:
Site Id: MIG000019366
WMD Id: 453592
Site Specific Name: BUDGET RENT A CAR
Mailing Address: 200 S ASHLEY ST
Mailing City/State/Zip: 48104
Mailing County: WASHTENAW

E24 **200 SOUTH ASHLEY STREET** **US BROWNFIELDS 1009828827**
East **200 SOUTH ASHLEY STREET** **N/A**
< 1/8 **ANN ARBOR, MI 48104**
0.103 mi.
543 ft. **Site 4 of 4 in cluster E**

Relative:
Higher

Actual:
833 ft.

US BROWNFIELDS:
Recipient name: Washtenaw County
Grant type: Assessment
Property name: 200 SOUTH ASHLEY STREET
Property #: 09-09-29-146-006
Parcel size: 0.1
Property Description: Main use as a gasoline station and car rental business
Latitude: 42.28064
Longitude: -83.74931
HCM label: Address Matching-House Number
Map scale: 1:24,000
Point of reference: Center of a Facility or Station
Datum: North American Datum of 1983
ACRES property ID: 21901
Start date: Not reported

200 SOUTH ASHLEY STREET (Continued) **1009828827**

Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	1500
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	EPA
Cleanup funding entity:	Not reported
Grant type:	P
Accomplishment type:	Phase I Environmental Assessment
Accomplishment count:	1
Cooperative agreement #:	96583901
Ownership entity:	Private
Current owner:	Gui Ponce de Leon
Did owner change:	N
Cleanup required:	Yes
Video available:	No
Photo available:	Yes
Institutional controls required:	U
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Unknown
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Not reported
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Y
Petro products cleaned:	Y

200 SOUTH ASHLEY STREET (Continued) **1009828827**

Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Y
Soil cleaned up:	Y
Surface water cleaned:	Not reported
Unknown found:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	0.1
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported

Recipient name:	Washtenaw County
Grant type:	Assessment
Property name:	200 SOUTH ASHLEY STREET
Property #:	09-09-29-146-006
Parcel size:	0.1
Property Description:	Main use as a gasoline station and car rental business
Latitude:	42.28064
Longitude:	-83.74931
HCM label:	Address Matching-House Number
Map scale:	1:24,000
Point of reference:	Center of a Facility or Station
Datum:	North American Datum of 1983
ACRES property ID:	21901
Start date:	Not reported
Completed date:	Not reported
Acres cleaned up:	Not reported
Cleanup funding:	Not reported
Cleanup funding source:	Not reported
Assessment funding:	5650
Assessment funding source:	US EPA - Brownfields Assessment Cooperative Agreement
Redevelopment funding:	Not reported
Redev. funding source:	Not reported
Redev. funding entity name:	Not reported
Redevelopment start date:	Not reported
Assessment funding entity:	EPA
Cleanup funding entity:	Not reported
Grant type:	P
Accomplishment type:	Phase II Environmental Assessment
Accomplishment count:	0
Cooperative agreement #:	96583901
Ownership entity:	Private
Current owner:	Gui Ponce de Leon
Did owner change:	N
Cleanup required:	Yes
Video available:	No
Photo available:	Yes

200 SOUTH ASHLEY STREET (Continued) **1009828827**

Institutional controls required:	U
IC Category proprietary controls:	Not reported
IC cat. info. devices:	Not reported
IC cat. gov. controls:	Not reported
IC cat. enforcement permit tools:	Not reported
IC in place date:	Not reported
IC in place:	Unknown
State/tribal program date:	Not reported
State/tribal program ID:	Not reported
State/tribal NFA date:	Not reported
Air contaminated:	Not reported
Air cleaned:	Not reported
Asbestos found:	Not reported
Asbestos cleaned:	Not reported
Controled substance found:	Not reported
Controled substance cleaned:	Not reported
Drinking water affected:	Not reported
Drinking water cleaned:	Not reported
Groundwater affected:	Not reported
Groundwater cleaned:	Not reported
Lead contaminant found:	Not reported
Lead cleaned up:	Not reported
No media affected:	Not reported
Unknown media affected:	Not reported
Other cleaned up:	Not reported
Other metals found:	Not reported
Other metals cleaned:	Not reported
Other contaminants found:	Not reported
Other contams found description:	Not reported
PAHs found:	Not reported
PAHs cleaned up:	Not reported
PCBs found:	Not reported
PCBs cleaned up:	Not reported
Petro products found:	Y
Petro products cleaned:	Y
Sediments found:	Not reported
Sediments cleaned:	Not reported
Soil affected:	Y
Soil cleaned up:	Y
Surface water cleaned:	Not reported
Unknown found:	Not reported
VOCs found:	Not reported
VOCs cleaned:	Not reported
Cleanup other description:	Not reported
Num. of cleanup and re-dev. jobs:	Not reported
Past use greenspace acreage:	Not reported
Past use residential acreage:	Not reported
Past use commercial acreage:	0.1
Past use industrial acreage:	Not reported
Future use greenspace acreage:	Not reported
Future use residential acreage:	Not reported
Future use commercial acreage:	Not reported
Future use industrial acreage:	Not reported
Greenspace acreage and type:	Not reported
Superfund Fed. landowner flag:	Not reported

25
SSE
< 1/8
0.113 mi.
597 ft.

EATON CORPORATION — **SHWS** — **S108632632**
315 SOUTH FIRST STREET — **N/A**
ANN ARBOR, MI 48103

Relative:
Higher

Actual:
820 ft.

SHWS:

Facility ID:	81000540
Facility Status:	**Interim Response conducted**
Source:	Not reported
SAM Score:	35
SAM Score Date:	03/27/2007
Township:	02S
Range:	06E
Section:	29
Quarter:	Not reported
Quarter/Quarter:	Not reported
Pollutants:	Not reported

F26
ENE
< 1/8
0.117 mi.
618 ft.

RO-AN REALTY CO — **UST** — **U003082898**
218-220 W HURON ST — **N/A**
ANN ARBOR, MI 48104

Site 1 of 4 in cluster F

Relative:
Higher

Actual:
829 ft.

UST:

Facility ID:	00036339
Facility Type:	CLOSED
Latitude:	42.28156
Longitude:	-83.75027
Owner Name:	RO-AN REALTY CO
Owner Address:	320 N MAIN SUITE 102 % BROOK MCCRAY SMITH PC
Owner City,St,Zip:	ANN ARBOR, MI 48104
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(734) 994-1337
Contact:	BROOK MCCRAY SMITH
Contact Phone:	(734) 994-1337
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number
Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	Not reported
Install Date:	Not reported
Product:	Gasoline
Remove Date:	05/01/1993
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Not reported
Construction Material:	Unknown
Impressed Device:	No

RO-AN REALTY CO (Continued) **U003082898**

Tank ID:	2
Tank Status:	**Removed from Ground**
Capacity:	Not reported
Install Date:	Not reported
Product:	Gasoline
Remove Date:	05/01/1993
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Not reported
Construction Material:	Unknown
Impressed Device:	No

Tank ID:	NRT3
Tank Status:	**Removed from Ground**
Capacity:	Not reported
Install Date:	Not reported
Product:	Not reported
Remove Date:	05/01/1993
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Construction Material:	Not reported
Impressed Device:	No

Tank ID:	NRT4
Tank Status:	**Removed from Ground**
Capacity:	Not reported
Install Date:	Not reported
Product:	Not reported
Remove Date:	05/01/1993
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Construction Material:	Not reported
Impressed Device:	No

Tank ID:	NRT5
Tank Status:	**Removed from Ground**
Capacity:	Not reported
Install Date:	Not reported
Product:	Not reported
Remove Date:	05/01/1993
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Construction Material:	Not reported
Impressed Device:	No

Tank ID: NRT6

RO-AN REALTY CO (Continued) **U003082898**

Tank Status:	**Removed from Ground**
Capacity:	Not reported
Install Date:	Not reported
Product:	Not reported
Remove Date:	05/01/1993
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Construction Material:	Not reported
Impressed Device:	No

F27 **BEA** **S107466504**
NE **204 W HURON** **N/A**
1/8-1/4 **ANN ARBOR CITY, MI 48104**
0.130 mi.
688 ft. **Site 2 of 4 in cluster F**

Relative:
Higher

Actual:
828 ft.

BEA:

Secondary Address:	Not reported
BEA Number:	669
District:	Jackson
Date Received:	11/22/2005
Submitter Name:	Ashley Terrace Holdings LLC
Petition Determination:	Affirmed
Petition Disclosure:	1
Category:	No Hazardous Substance(s)
Determination 20107A:	No Request
Reviewer:	katkov
Division Assigned:	Environmental Response Division

Secondary Address:	Not reported
BEA Number:	670
District:	Jackson
Date Received:	11/22/2005
Submitter Name:	Ashley Terrace Condominiums LLC
Petition Determination:	Affirmed
Petition Disclosure:	1
Category:	No Hazardous Substance(s)
Determination 20107A:	No Request
Reviewer:	katkov
Division Assigned:	Environmental Response Division

F28 **RO AN REALITY CO** **RCRA NonGen / NLR** **1000866017**
NE **208 W HURON ST** **FINDS** **MID985661651**
1/8-1/4 **ANN ARBOR, MI 48104**
0.130 mi.
688 ft. **Site 3 of 4 in cluster F**

Relative:
Higher

Actual:
828 ft.

RCRA NonGen / NLR:

Date form received by agency:	05/07/1993
Facility name:	RO AN REALITY CO
Facility address:	208 W HURON ST ANN ARBOR, MI 48104
EPA ID:	MID985661651
Mailing address:	218 THRU 220 W HURON ST

RO AN REALITY CO (Continued) **1000866017**

ANN ARBOR, MI 48104
Contact: ANDREW GULVEZAN
Contact address: 208 W HURON ST
ANN ARBOR, MI 48104
Contact country: US
Contact telephone: (313) 741-1444
Contact email: Not reported
EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 05/08/1993
Owner/Op end date: Not reported

Owner/operator name: NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 05/08/1993
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE

RO AN REALITY CO (Continued) **1000866017**

MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110003682391

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

F29 **ASHLEY TERRANCE DEVELOPMENT** **LUST U004051408**
NE **208 WEST HURON STREET** **UST N/A**
1/8-1/4 **ANN ARBOR, MI 48025**
0.130 mi.
688 ft. **Site 4 of 4 in cluster F**

Relative:
Higher

Actual:
828 ft.

LUST:

Facility ID:	00041872
Source:	STATE OF MICHIGAN
Owner Name:	Ashley Terrace Holdings LLC
Owner Address:	30600 Telegraph RdSuite 4290
Owner City,St,Zip:	Bingham Farms, MI 48025
Owner Contact:	Not reported
Owner Phone:	(248) 203-6458
Country:	USA
District:	Jackson District Office
Site Name:	Ashley Terrance Development
Latitude:	42.28161
Longitude:	-83.75020
Date of Collection:	10/07/2006
Method of Collection:	GPS Code Meas. Standard Positioning Service SA Off
Accuracy:	40
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0249-06
Release Date:	07/24/2006
Substance Released:	Gasoline,Diesel
Release Status:	Closed
Release Closed Date:	01/08/2008

UST:

Facility ID:	00041872
Facility Type:	CLOSED
Latitude:	42.28161
Longitude:	-83.75020
Owner Name:	ASHLEY TERRACE HOLDINGS LLC
Owner Address:	30600 TELEGRAPH RDSUITE 4290
Owner City,St,Zip:	BINGHAM FARMS, MI 48025

ASHLEY TERRANCE DEVELOPMENT (Continued) **U004051408**

Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(248) 203-6458
Contact:	Jim Hehle
Contact Phone:	(248) 203-6458
Date of Collection:	10/07/2006
Accuracy:	40
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	GPS Code Meas. Standard Positioning Service SA Off

Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	1000
Install Date:	Not reported
Product:	Gasoline
Remove Date:	07/12/2006
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Not reported
Construction Material:	Unknown
Impressed Device:	No

Tank ID:	2
Tank Status:	**Removed from Ground**
Capacity:	650
Install Date:	Not reported
Product:	Gasoline
Remove Date:	07/12/2006
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel
Impressed Device:	No

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30 **ROSS-BEAKES COLLISION** **RCRA-CESQG** **1000376340**
NNE **314 W ANN ST** **FINDS** **MID981532377**
1/8-1/4 **ANN ARBOR, MI 48104**
0.136 mi.
719 ft.

Relative:
Higher

Actual:
813 ft.

RCRA-CESQG:

Date form received by agency:	03/17/2008
Facility name:	ROSS-BEAKES COLLISION
Facility address:	314 W ANN ST ANN ARBOR, MI 48104
EPA ID:	MID981532377
Contact:	KEN WISNIEWSKI
Contact address:	314 W ANN ST ANN ARBOR, MI 48104
Contact country:	US
Contact telephone:	(734) 662-4141

ROSS-BEAKES COLLISION (Continued) **1000376340**

Contact email: Not reported
EPA Region: 05
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: KEN WISNIEWSKI
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 01/02/2007
Owner/Op end date: Not reported

Owner/operator name: KEN WISNIEWSKI
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 01/02/2007
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

ROSS-BEAKES COLLISION (Continued) **1000376340**

Historical Generators:

Date form received by agency: 08/13/2007
Facility name: ROSS-BEAKES COLLISION
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 03/20/2007
Facility name: ROSS-BEAKES COLLISION
Classification: Small Quantity Generator

Date form received by agency: 08/08/2006
Facility name: ROSS-BEAKES COLLISION
Classification: Small Quantity Generator

Date form received by agency: 02/21/2005
Facility name: ROSS-BEAKES COLLISION
Classification: Small Quantity Generator

Date form received by agency: 07/15/2004
Facility name: ROSS-BEAKES COLLISION
Classification: Small Quantity Generator

Date form received by agency: 04/01/2003
Facility name: ROSS-BEAKES COLLISION
Classification: Small Quantity Generator

Date form received by agency: 07/31/1986
Facility name: ROSS-BEAKES COLLISION
Classification: Small Quantity Generator

Hazardous Waste Summary:

Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110003620387

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

31
WNW
1/8-1/4
0.143 mi.
754 ft.

FULLSERV INC
603 WEST HURON STREET
ANN ARBOR, MI 48103

MANIFEST

1009224134
N/A

Relative:
Higher

Actual:
820 ft.

NY MANIFEST:

EPA ID:	MIG999999993
Country:	USA
Mailing Name:	FULLSERV INC
Mailing Contact:	TOMMY JOHNSON
Mailing Address:	603 WEST HURON STREET
Mailing Address 2:	Not reported
Mailing City:	ANN ARBOR
Mailing State:	MI
Mailing Zip:	48103
Mailing Zip4:	Not reported
Mailing Country:	USA
Mailing Phone:	313-913-0690

Document ID:	NYB8380881
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MI041
Trans2 State ID:	Not reported
Generator Ship Date:	961108
Trans1 Recv Date:	961108
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	961127
Part A Recv Date:	961120
Part B Recv Date:	961224
Generator EPA ID:	MIG999999993
Trans1 EPA ID:	MID981094618
Trans2 EPA ID:	Not reported
TSDF ID:	NYD045604964
Waste Code:	D011 - SILVER 5.0 MG/L TCLP
Quantity:	00055
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	011
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	R Material recovery of more than 75 percent of the total material.
Specific Gravity:	100
Year:	96

Document ID:	NYB8378883
Manifest Status:	Completed copy
Trans1 State ID:	MI041
Trans2 State ID:	Not reported
Generator Ship Date:	970221
Trans1 Recv Date:	970221
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	970227
Part A Recv Date:	970305
Part B Recv Date:	970313
Generator EPA ID:	MIG999999993
Trans1 EPA ID:	MID981094618
Trans2 EPA ID:	Not reported
TSDF ID:	NYD045604964

FULLSERV INC (Continued) **1009224134**

Waste Code: D011 - SILVER 5.0 MG/L TCLP
Quantity: 00020
Units: G - Gallons (liquids only)* (8.3 pounds)
Number of Containers: 004
Container Type: DF - Fiberboard or plastic drums (glass)
Handling Method: R Material recovery of more than 75 percent of the total material.
Specific Gravity: 100
Year: 97

Document ID: NYB8381412
Manifest Status: Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID: MI041
Trans2 State ID: Not reported
Generator Ship Date: 970110
Trans1 Recv Date: 970110
Trans2 Recv Date: Not reported
TSD Site Recv Date: 970123
Part A Recv Date: 970130
Part B Recv Date: 970205
Generator EPA ID: MIG999999993
Trans1 EPA ID: MID981094618
Trans2 EPA ID: Not reported
TSDF ID: NYD045604964
Waste Code: D011 - SILVER 5.0 MG/L TCLP
Quantity: 00035
Units: G - Gallons (liquids only)* (8.3 pounds)
Number of Containers: 007
Container Type: DF - Fiberboard or plastic drums (glass)
Handling Method: R Material recovery of more than 75 percent of the total material.
Specific Gravity: 100
Year: 97

Document ID: NYB8378361
Manifest Status: Completed copy
Trans1 State ID: MI041
Trans2 State ID: Not reported
Generator Ship Date: 970425
Trans1 Recv Date: 970425
Trans2 Recv Date: Not reported
TSD Site Recv Date: 970502
Part A Recv Date: 970507
Part B Recv Date: 970516
Generator EPA ID: MIG999999993
Trans1 EPA ID: MID981094618
Trans2 EPA ID: Not reported
TSDF ID: NYD045604964
Waste Code: D011 - SILVER 5.0 MG/L TCLP
Quantity: 00030
Units: G - Gallons (liquids only)* (8.3 pounds)
Number of Containers: 006
Container Type: DF - Fiberboard or plastic drums (glass)
Handling Method: R Material recovery of more than 75 percent of the total material.
Specific Gravity: 100
Year: 97

FULLSERV INC (Continued) **1009224134**

Document ID: NYG0183123
Manifest Status: Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID: MI041
Trans2 State ID: Not reported
Generator Ship Date: 970613
Trans1 Recv Date: 970613
Trans2 Recv Date: Not reported
TSD Site Recv Date: 970701
Part A Recv Date: 970708
Part B Recv Date: 970801
Generator EPA ID: MIG999999993
Trans1 EPA ID: MID981094618
Trans2 EPA ID: Not reported
TSDF ID: NYD045604964
Waste Code: D011 - SILVER 5.0 MG/L TCLP
Quantity: 00035
Units: G - Gallons (liquids only)* (8.3 pounds)
Number of Containers: 007
Container Type: DF - Fiberboard or plastic drums (glass)
Handling Method: R Material recovery of more than 75 percent of the total material.
Specific Gravity: 100
Year: 97

Document ID: NYG0184032
Manifest Status: Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID: MI041
Trans2 State ID: Not reported
Generator Ship Date: 970814
Trans1 Recv Date: 970814
Trans2 Recv Date: Not reported
TSD Site Recv Date: 970826
Part A Recv Date: 970909
Part B Recv Date: 970923
Generator EPA ID: MIG999999993
Trans1 EPA ID: MID981094618
Trans2 EPA ID: Not reported
TSDF ID: NYD045604964
Waste Code: D011 - SILVER 5.0 MG/L TCLP
Quantity: 00015
Units: G - Gallons (liquids only)* (8.3 pounds)
Number of Containers: 003
Container Type: DF - Fiberboard or plastic drums (glass)
Handling Method: R Material recovery of more than 75 percent of the total material.
Specific Gravity: 100
Year: 97

Document ID: NYG0185499
Manifest Status: Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID: MI041
Trans2 State ID: Not reported
Generator Ship Date: 971117
Trans1 Recv Date: 971117
Trans2 Recv Date: Not reported
TSD Site Recv Date: 971125
Part A Recv Date: 971202

FULLSERV INC (Continued) **1009224134**

Part B Recv Date:	971223
Generator EPA ID:	MIG999999993
Trans1 EPA ID:	MID981094618
Trans2 EPA ID:	Not reported
TSDF ID:	NYD045604964
Waste Code:	D011 - SILVER 5.0 MG/L TCLP
Quantity:	00060
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	012
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	R Material recovery of more than 75 percent of the total material.
Specific Gravity:	100
Year:	97

Document ID:	NYG0184518
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MI041
Trans2 State ID:	Not reported
Generator Ship Date:	970908
Trans1 Recv Date:	970908
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	970923
Part A Recv Date:	970917
Part B Recv Date:	971015
Generator EPA ID:	MIG999999993
Trans1 EPA ID:	MID981094618
Trans2 EPA ID:	Not reported
TSDF ID:	NYD045604964
Waste Code:	D011 - SILVER 5.0 MG/L TCLP
Quantity:	00020
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	004
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	R Material recovery of more than 75 percent of the total material.
Specific Gravity:	100
Year:	97

Document ID:	NYG0183636
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MI041
Trans2 State ID:	Not reported
Generator Ship Date:	970722
Trans1 Recv Date:	970722
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	970730
Part A Recv Date:	Not reported
Part B Recv Date:	970818
Generator EPA ID:	MIG999999993
Trans1 EPA ID:	MID981094618
Trans2 EPA ID:	Not reported
TSDF ID:	NYD045604964
Waste Code:	D011 - SILVER 5.0 MG/L TCLP
Quantity:	00030
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	006

FULLSERV INC (Continued) **1009224134**

Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	R Material recovery of more than 75 percent of the total material.
Specific Gravity:	100
Year:	97

Document ID:	NYG0874539
Manifest Status:	Completed after the designated time period for a TSDF to get a copy to the DEC
Trans1 State ID:	MI041
Trans2 State ID:	Not reported
Generator Ship Date:	971223
Trans1 Recv Date:	971223
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	971230
Part A Recv Date:	980115
Part B Recv Date:	980127
Generator EPA ID:	MIG999999993
Trans1 EPA ID:	MID981094618
Trans2 EPA ID:	Not reported
TSDF ID:	NYD045604964
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00030
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	006
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	100
Year:	97

Document ID:	NYG0499293
Manifest Status:	Not reported
Trans1 State ID:	MID981094618
Trans2 State ID:	Not reported
Generator Ship Date:	01/08/1999
Trans1 Recv Date:	01/08/1999
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	01/11/1999
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MIG999999993
Trans1 EPA ID:	NYD045604964
Trans2 EPA ID:	Not reported
TSDF ID:	MI041
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00015
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	003
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Year:	99

Document ID:	NYG1180143
Manifest Status:	Not reported
Trans1 State ID:	MID981094618

FULLSERV INC (Continued) **1009224134**

Trans2 State ID:	Not reported
Generator Ship Date:	02/19/1999
Trans1 Recv Date:	02/19/1999
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	02/25/1999
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MIG999999993
Trans1 EPA ID:	NYD045604964
Trans2 EPA ID:	Not reported
TSDF ID:	MI041
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00040
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	008
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	R Material recovery of more than 75 percent of the total material.
Specific Gravity:	01.00
Year:	99

Document ID:	NYG1180638
Manifest Status:	Not reported
Trans1 State ID:	MID981094618
Trans2 State ID:	Not reported
Generator Ship Date:	03/23/1999
Trans1 Recv Date:	03/23/1999
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	03/29/1999
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MIG999999993
Trans1 EPA ID:	NYD045604964
Trans2 EPA ID:	Not reported
TSDF ID:	MI041
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00025
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	005
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Year:	99

Document ID:	NYG0499419
Manifest Status:	Not reported
Trans1 State ID:	MID981094618
Trans2 State ID:	Not reported
Generator Ship Date:	03/20/1998
Trans1 Recv Date:	03/20/1998
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	03/30/1998
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MIG999999993
Trans1 EPA ID:	NYD045604964

FULLSERV INC (Continued) **1009224134**

Trans2 EPA ID: Not reported
TSDF ID: MI041
Waste Code: D002 - NON-LISTED CORROSIVE WASTES
Quantity: 00035
Units: G - Gallons (liquids only)* (8.3 pounds)
Number of Containers: 007
Container Type: DF - Fiberboard or plastic drums (glass)
Handling Method: R Material recovery of more than 75 percent of the total material.
Specific Gravity: 01.00
Year: 98

Document ID: NYG0499536
Manifest Status: Not reported
Trans1 State ID: MID981094618
Trans2 State ID: Not reported
Generator Ship Date: 01/23/1998
Trans1 Recv Date: 01/23/1998
Trans2 Recv Date: Not reported
TSD Site Recv Date: 02/03/1998
Part A Recv Date: Not reported
Part B Recv Date: Not reported
Generator EPA ID: MIG999999993
Trans1 EPA ID: NYD045604964
Trans2 EPA ID: Not reported
TSDF ID: MI041
Waste Code: D002 - NON-LISTED CORROSIVE WASTES
Quantity: 00035
Units: G - Gallons (liquids only)* (8.3 pounds)
Number of Containers: 007
Container Type: DF - Fiberboard or plastic drums (glass)
Handling Method: R Material recovery of more than 75 percent of the total material.
Specific Gravity: 01.00
Year: 98

Document ID: NYG0499743
Manifest Status: Not reported
Trans1 State ID: MID981094618
Trans2 State ID: Not reported
Generator Ship Date: 02/11/1998
Trans1 Recv Date: 02/11/1998
Trans2 Recv Date: Not reported
TSD Site Recv Date: 02/26/1998
Part A Recv Date: Not reported
Part B Recv Date: Not reported
Generator EPA ID: MIG999999993
Trans1 EPA ID: NYD045604964
Trans2 EPA ID: Not reported
TSDF ID: MI041
Waste Code: D002 - NON-LISTED CORROSIVE WASTES
Quantity: 00025
Units: G - Gallons (liquids only)* (8.3 pounds)
Number of Containers: 005
Container Type: DF - Fiberboard or plastic drums (glass)
Handling Method: T Chemical, physical, or biological treatment.
Specific Gravity: 01.00

FULLSERV INC (Continued) **1009224134**

Year: 98

Document ID: NYG0606051
Manifest Status: Not reported
Trans1 State ID: MID981094618
Trans2 State ID: Not reported
Generator Ship Date: 06/26/1998
Trans1 Recv Date: 06/26/1998
Trans2 Recv Date: Not reported
TSD Site Recv Date: 07/02/1998
Part A Recv Date: Not reported
Part B Recv Date: Not reported
Generator EPA ID: MIG999999993
Trans1 EPA ID: NYD045604964
Trans2 EPA ID: Not reported
TSDF ID: MI041
Waste Code: D002 - NON-LISTED CORROSIVE WASTES
Quantity: 00025
Units: G - Gallons (liquids only)* (8.3 pounds)
Number of Containers: 005
Container Type: DF - Fiberboard or plastic drums (glass)
Handling Method: T Chemical, physical, or biological treatment.
Specific Gravity: 01.00
Year: 98

Document ID: NYG0606672
Manifest Status: Not reported
Trans1 State ID: MID981094618
Trans2 State ID: Not reported
Generator Ship Date: 07/28/1998
Trans1 Recv Date: 07/28/1998
Trans2 Recv Date: Not reported
TSD Site Recv Date: 08/04/1998
Part A Recv Date: Not reported
Part B Recv Date: Not reported
Generator EPA ID: MIG999999993
Trans1 EPA ID: NYD045604964
Trans2 EPA ID: Not reported
TSDF ID: MI041
Waste Code: D002 - NON-LISTED CORROSIVE WASTES
Quantity: 00030
Units: G - Gallons (liquids only)* (8.3 pounds)
Number of Containers: 006
Container Type: DF - Fiberboard or plastic drums (glass)
Handling Method: T Chemical, physical, or biological treatment.
Specific Gravity: 01.00
Year: 98

Document ID: NYG0607248
Manifest Status: Not reported
Trans1 State ID: MID981094618
Trans2 State ID: Not reported
Generator Ship Date: 08/26/1998
Trans1 Recv Date: 08/26/1998

FULLSERV INC (Continued) **1009224134**

Trans2 Recv Date:	Not reported
TSD Site Recv Date:	08/31/1998
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MIG999999993
Trans1 EPA ID:	NYD045604964
Trans2 EPA ID:	Not reported
TSDF ID:	MI041
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00020
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	004
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Year:	98

Document ID:	NYG0607635
Manifest Status:	Not reported
Trans1 State ID:	MID981094618
Trans2 State ID:	Not reported
Generator Ship Date:	09/28/1998
Trans1 Recv Date:	09/28/1998
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	10/06/1998
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	MIG999999993
Trans1 EPA ID:	NYD045604964
Trans2 EPA ID:	Not reported
TSDF ID:	MI041
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00020
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	004
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Year:	98

Click this hyperlink while viewing on your computer to access
4 additional NY_MANIFEST: record(s) in the EDR Site Report.

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32 **SIR SPEEDY** **RCRA-CESQG** **1004724989**
SE **350 S MAIN ST** **FINDS** **MIR000022152**
1/8-1/4 **ANN ARBOR, MI 48104**
0.157 mi.
827 ft.

Relative:
Higher

Actual:
838 ft.

RCRA-CESQG:

Date form received by agency:	03/10/1997
Facility name:	SIR SPEEDY
Facility address:	350 S MAIN ST ANN ARBOR, MI 48104
EPA ID:	MIR000022152
Contact:	BASSEM KHAFAGI
Contact address:	350 S MAIN ST

SIR SPEEDY (Continued) **1004724989**

ANN ARBOR, MI 48104
Contact country: US
Contact telephone: (313) 997-9100
Contact email: Not reported
EPA Region: 05
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: KHAFAGI BASSEM
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 01/01/1970
Owner/Op end date: Not reported

Owner/operator name: KHAFAGI BASSEM
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 01/01/1970
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No

SIR SPEEDY (Continued) **1004724989**

Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110003700184

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

G33 **WEST WASHINGTON STREET ASSOCIATES** **RCRA NonGen / NLR** **1001026222**
East **112 W WASHINGTON ST** **FINDS** **MIR000006551**
1/8-1/4 **ANN ARBOR, MI 48104**
0.157 mi.
829 ft. **Site 1 of 2 in cluster G**

Relative:
Higher

Actual:
838 ft.

RCRA NonGen / NLR:
Date form received by agency: 08/08/1995
Facility name: WEST WASHINGTON STREET ASSOCIATES
Facility address: 112 W WASHINGTON ST
ANN ARBOR, MI 48104
EPA ID: MIR000006551
Mailing address: 116 W WASHINGTON ST
ANN ARBOR, MI 48104
Contact: JON CARLSON
Contact address: 112 W WASHINGTON ST
ANN ARBOR, MI 48104
Contact country: US
Contact telephone: (734) 741-9371
Contact email: Not reported
EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: WEST WASHINGTON STREET ASSOCIATES
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported

WEST WASHINGTON STREET ASSOCIATES (Continued) **1001026222**

Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 01/01/1970
Owner/Op end date: Not reported

Owner/operator name: WEST WASHINGTON STREET ASSOCIATES
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 01/01/1970
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110003690471

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

H34 **U OF M ARGUS BUILDING** **SHWS** **S109029760**
SW **400 FOURTH ST** **N/A**
1/8-1/4 **ANN ARBOR, MI 48103**
0.164 mi.
865 ft. **Site 1 of 3 in cluster H**

Relative:
Higher

Actual:
824 ft.

SHWS:

Facility ID:	81000105
Facility Status:	**See Leaking Underground Storage Tank Site Database**
Source:	Not reported
SAM Score:	37
SAM Score Date:	11/01/2006
Township:	02S
Range:	06E
Section:	29
Quarter:	Not reported
Quarter/Quarter:	Not reported
Pollutants:	Not reported

H35 **U OF M ARGUS BLDG** **LUST** **S100427038**
SW **400 4TH ST** **N/A**
1/8-1/4 **ANN ARBOR, MI 48103**
0.164 mi.
865 ft. **Site 2 of 3 in cluster H**

Relative:
Higher

Actual:
824 ft.

LUST:

Facility ID:	50000735
Source:	STATE OF MICHIGAN
Owner Name:	Nrt Owner
Owner Address:	Unknown
Owner City,St,Zip:	Unknown, MI 99999
Owner Contact:	Not reported
Owner Phone:	Not reported
Country:	USA
District:	Jackson District Office
Site Name:	U Of M Argus Bldg.
Latitude:	42.27787
Longitude:	-83.75504
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0290-90
Release Date:	02/14/1990
Substance Released:	Not reported
Release Status:	Open
Release Closed Date:	Not reported

H36 **UNIVERSITY OF MICHIGAN** **RCRA-CESQG** **1007099060**
SW **400 S 4TH ST** **MIK613424787**
1/8-1/4 **ANN ARBOR, MI 48103**
0.164 mi.
865 ft. **Site 3 of 3 in cluster H**

Relative:
Higher

Actual:
824 ft.

RCRA-CESQG:

Date form received by agency:	03/19/2010
Facility name:	UNIVERSITY OF MICHIGAN
Facility address:	400 S 4TH ST ANN ARBOR, MI 48103
EPA ID:	MIK613424787
Mailing address:	1655 DEAN RD ANN ARBOR, MI 48109
Contact:	MICHAEL R DRESSLER
Contact address:	Not reported Not reported
Contact country:	Not reported
Contact telephone:	(734) 763-4568
Contact email:	Not reported
EPA Region:	05
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	UNIV OF MICHIGAN BOARD OF REGENTS
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	State
Owner/Operator Type:	Owner
Owner/Op start date:	01/01/1963
Owner/Op end date:	Not reported

Owner/operator name:	UNIV OF MICHIGAN BOARD OF REGENTS
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	State
Owner/Operator Type:	Operator
Owner/Op start date:	01/01/1963
Owner/Op end date:	Not reported

UNIVERSITY OF MICHIGAN (Continued) **1007099060**

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 03/19/2010
Facility name: UNIVERSITY OF MICHIGAN
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 10/27/2009
Facility name: UNIVERSITY OF MICHIGAN
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 09/14/2009
Facility name: UNIVERSITY OF MICHIGAN
Classification: Large Quantity Generator

Date form received by agency: 08/26/2003
Facility name: UNIVERSITY OF MICHIGAN
Classification: Conditionally Exempt Small Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: D003
Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

Waste code: F002
Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND

UNIVERSITY OF MICHIGAN (Continued) **1007099060**

1,1,2-TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE LISTED IN F001, F004, OR F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Biennial Reports:

Last Biennial Reporting Year: 2011

Annual Waste Handled:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Amount (Lbs): 66

Waste code: D003
Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.
Amount (Lbs): 6

Waste code: F002
Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2-TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE LISTED IN F001, F004, OR F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Amount (Lbs): 6000

Violation Status: No violations found

G37 **GREAT COPY CO** **RCRA NonGen / NLR** **1000158456**
East **110 E WASHINGTON ST** **FINDS** **MID091606947**
1/8-1/4 **ANN ARBOR, MI 48104**
0.173 mi.
913 ft. **Site 2 of 2 in cluster G**

Relative:
Higher

Actual:
839 ft.

RCRA NonGen / NLR:

Date form received by agency:	12/31/2001
Facility name:	GREAT COPY CO
Facility address:	110 E WASHINGTON ST ANN ARBOR, MI 48104
EPA ID:	MID091606947
Mailing address:	PO BOX 8110 ANN ARBOR, MI 48107
Contact:	BILL TERNES
Contact address:	110 E WASHINGTON ST ANN ARBOR, MI 48104
Contact country:	US
Contact telephone:	(313) 994-0222
Contact email:	Not reported
EPA Region:	05
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	01/01/2002
Owner/Op end date:	Not reported

Owner/operator name:	NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	01/01/2002
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No

GREAT COPY CO (Continued) **1000158456**

Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 09/02/1988
Facility name: GREAT COPY CO
Classification: Small Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110003607605

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

38
SE
1/8-1/4
0.183 mi.
966 ft.

EMRE FUEL INC
402 S MAIN ST
ANN ARBOR, MI 48104

RCRA-CESQG **1000466046**
FINDS **MID985607720**
LUST
UST
WDS

Relative:
Higher

Actual:
837 ft.

RCRA-CESQG:
Date form received by agency: 12/31/2001
Facility name: EMRE FUEL INC
Facility address: 402 S MAIN ST
ANN ARBOR, MI 48104
EPA ID: MID985607720
Contact: NABIL HASSAN
Contact address: 402 S MAIN ST
ANN ARBOR, MI 48104
Contact country: US
Contact telephone: (313) 761-1170
Contact email: Not reported
EPA Region: 05
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar

EMRE FUEL INC (Continued) **1000466046**

month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	AMOCO OIL CO
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	06/07/2001
Owner/Op end date:	Not reported

Owner/operator name:	AMOCO OIL CO
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	06/07/2001
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency:	08/08/2001
Facility name:	EMRE FUEL INC
Classification:	Small Quantity Generator

Date form received by agency: 03/05/1991

EMRE FUEL INC (Continued) **1000466046**

Facility name: EMRE FUEL INC
Classification: Small Quantity Generator

Date form received by agency: 01/01/1980
Facility name: EMRE FUEL INC
Classification: Not a generator, verified

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110003653877

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

LUST:
Facility ID: 00005811
Source: STATE OF MICHIGAN
Owner Name: Emre Fuel Inc
Owner Address: 402 S Main St
Owner City,St,Zip: Ann Arbor, MI 48104
Owner Contact: Not reported
Owner Phone: (734) 766-1170
Country: USA
District: Jackson District Office
Site Name: Amoco SS #5447
Latitude: 42.27782
Longitude: -83.74921
Date of Collection: 05/03/2002
Method of Collection: GPS Code Meas. Standard Positioning Service SA Off
Accuracy: 10
Accuracy Value Unit: METERS
Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)

Leak Number: C-0296-02
Release Date: 05/22/2002
Substance Released: Gasoline
Release Status: Closed

EMRE FUEL INC (Continued) **1000466046**

Release Closed Date: 05/30/2003

Leak Number: C-2274-91
Release Date: 10/25/1991
Substance Released: Unknown
Release Status: Closed
Release Closed Date: 01/10/1995

UST:
Facility ID: 00005811
Facility Type: ACTIVE
Latitude: 42.27782
Longitude: -83.74921
Owner Name: EMRE FUEL INC
Owner Address: 402 S MAIN ST
Owner City,St,Zip: ANN ARBOR, MI 48104
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (734) 766-1170
Contact: John Abed
Contact Phone: (734) 761-1170
Date of Collection: 05/03/2002
Accuracy: 10
Accuracy Value Unit: METERS
Horizontal Datum: NAD83
Source: STATE OF MICHIGAN
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)
Method of Collection: GPS Code Meas. Standard Positioning Service SA Off

Tank ID: 1
Tank Status: Removed from Ground
Capacity: 550
Install Date: 04/28/1970
Product: Used Oil
Remove Date: 10/25/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 2
Tank Status: Removed from Ground
Capacity: 8000
Install Date: 04/28/1970
Product: Gasoline
Remove Date: 10/25/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

EMRE FUEL INC (Continued) **1000466046**

Tank ID: 3
Tank Status: Removed from Ground
Capacity: 12000
Install Date: 04/28/1970
Product: Gasoline
Remove Date: 10/25/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 4
Tank Status: Removed from Ground
Capacity: 12000
Install Date: 04/28/1970
Product: Gasoline
Remove Date: 10/25/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 5
Tank Status: Currently In Use
Capacity: 12000
Install Date: 10/25/1991
Product: Gasoline
Remove Date: Not reported
Tank Release Detection: Automatic Tank Gauging
Pipe Realease Detection: Automatic Line Leak Detectors,Line Tightness Testing
Piping Material: Fiberglass reinforced plastic
Piping Type: Pressure
Construction Material: Cathodically Protected Steel
Impressed Device: No

Tank ID: 6
Tank Status: Currently In Use
Capacity: 12000
Install Date: 10/25/1991
Product: Gasoline
Remove Date: Not reported
Tank Release Detection: Automatic Tank Gauging
Pipe Realease Detection: Automatic Line Leak Detectors,Line Tightness Testing
Piping Material: Fiberglass reinforced plastic
Piping Type: Pressure
Construction Material: Cathodically Protected Steel
Impressed Device: No

Tank ID: 7

EMRE FUEL INC (Continued) **1000466046**

Tank Status:	**Currently In Use**
Capacity:	12000
Install Date:	10/25/1991
Product:	Gasoline
Remove Date:	Not reported
Tank Release Detection:	Automatic Tank Gauging
Pipe Realease Detection:	Line Tightness Testing
Piping Material:	Fiberglass reinforced plastic
Piping Type:	Pressure
Construction Material:	Cathodically Protected Steel
Impressed Device:	No

Tank ID:	8
Tank Status:	**Removed from Ground**
Capacity:	560
Install Date:	10/25/1991
Product:	Used Oil
Remove Date:	05/31/2008
Tank Release Detection:	Automatic Tank Gauging,Inventory Control,Manual Tank Gauging,Tank Tightness Testing
Pipe Realease Detection:	Automatic Line Leak Detectors,Line Tightness Testing
Piping Material:	Fiberglass reinforced plastic
Piping Type:	Pressure
Construction Material:	Cathodically Protected Steel
Impressed Device:	No

WDS:

Site Id:	MID985607720
WMD Id:	404664
Site Specific Name:	SOUTH MAIN BP
Mailing Address:	402 S MAIN ST
Mailing City/State/Zip:	48104
Mailing County:	WASHTENAW

I39 **NATIONAL CITY BANK** **RCRA-CESQG** **1007880051**
ENE **101 S MAIN ST** **MIK354217168**
1/8-1/4 **ANN ARBOR, MI 48104**
0.186 mi.
981 ft. **Site 1 of 2 in cluster I**

Relative:
Higher

Actual:
837 ft.

RCRA-CESQG:

Date form received by agency:	12/27/2004
Facility name:	NATIONAL CITY BANK
Facility address:	101 S MAIN ST ANN ARBOR, MI 48104
EPA ID:	MIK354217168
Contact:	BART QUINLEY
Contact address:	101 S MAIN ST ANN ARBOR, MI 48104
Contact country:	US
Contact telephone:	(734) 721-5511
Contact email:	Not reported
EPA Region:	05
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time;

NATIONAL CITY BANK (Continued) **1007880051**

or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	NATIONAL CITY BANK
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	12/27/2004
Owner/Op end date:	Not reported

Owner/operator name:	NATIONAL CITY BANK
Owner/operator address:	Not reported
	Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	12/27/2004
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Hazardous Waste Summary:

Waste code:	D001
Waste name:	IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE

NATIONAL CITY BANK (Continued) **1007880051**

FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

I40 **CITY OF ANN ARBOR** **RCRA NonGen / NLR** **1000828199**
ENE **111 N MAIN ST** **FINDS** **MID985652627**
1/8-1/4 **ANN ARBOR, MI 48104**
0.188 mi.
992 ft. **Site 2 of 2 in cluster I**

Relative:
Higher

Actual:
837 ft.

RCRA NonGen / NLR:

Date form received by agency:	12/31/2001
Facility name:	CITY OF ANN ARBOR
Facility address:	111 N MAIN ST ANN ARBOR, MI 48104
EPA ID:	MID985652627
Mailing address:	PO BOX 8647 ANN ARBOR, MI 48107
Contact:	DAN CULLEN
Contact address:	111 N MAIN ST ANN ARBOR, MI 48104
Contact country:	US
Contact telephone:	(313) 994-6696
Contact email:	Not reported
EPA Region:	05
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	01/01/2002
Owner/Op end date:	Not reported

Owner/operator name:	NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	01/01/2002
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No

CITY OF ANN ARBOR (Continued) **1000828199**

Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 10/19/1992
Facility name: CITY OF ANN ARBOR
Classification: Small Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110003675844

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

J41 **BILL MUNCYS SERVICE** **AUL** **S109278301**
North **423 MILLER AVE.** **N/A**
1/8-1/4 **ANN ARBOR CITY, MI 48103**
0.213 mi.
1127 ft. **Site 1 of 2 in cluster J**

Relative:
Lower

Actual:
798 ft.

AUL:
Status: Recorded
Site Name: Not reported
Property: 423 Miller Ave., Ann Arbor
Land Use Restriction Type: RC
Program Type: Part 213
Program Support Assigned User: Nicholas Swartz
Program Support Assigned Date: 5/13/2009 11:19:22.66
Legal Description Of Property: Migrated
Based On The Deq Ref #: 11121305057

BILL MUNCYS SERVICE (Continued) **S109278301**

MDEQ Reference Number:	RC-RRD-213-05-057	
Property Or Description Restricted Area:	Bill Muncy's Service	
Lead Division:	STD	
File Name Of Hyperlinked Legal Doc:	U:\\KERMIT\\11121305057.pdf	
Mapped Polygons Area In Acres:	0.2177	
Mapped Polygons Area In Square Miles:	2.9999999999999997E-4	
Date Data Entry Started:	5/13/2009 00:00:00	
Date Data Entry Finished:	5/13/2009 00:00:00	
Individual Or Staff Assoc With The Mapping:		Nicholas Swartz
Program Used To Map Restricted Features:		ArcInfo 9.3 and IcoMap 4.2
Map Comments:		Property polygon is NOT mapped in KERMIT as of 10/10/2008. LUR is mapped in KERMIT as of 20090513 - Nick Swartz
Comment:		Request received on 6/15/2005.
Date Legal Paperwork Stamped/Filed/Register Of Deeds:		11/10/1999 00:00:00
Commercial I Land Use Restriction:	0	
Commercial Ii Land Use Restriction:	0	
Commercial Iii Land Use Restriction:	0	
Commercial Iv Land Use Restriction:	0	
Industrial Land Use Restriction:	0	
Residential Land Use Restriction:	0	
Recreational Land Use Restriction:	0	
Multiple Land-Use Restrictions:	0	
Site Specific Restrictions:	1	
Groundwater Consumption Restrictions:	1	
Groundwater Contact Restrictions:	0	
Special Well Construction Requirements:	0	
Special Building Restrictions:	0	
Excavation And Soil Movement Restrictions:		1
Soil Movement Requirements:		0
There Is A Restriction On All Construction:		0
Monitoring Well Protected, No Tampering Or Removal:		0
There Is An Exposure Barrier In Place:		0
There Is A Health And Safety Plan:		1
There Is A Permanent Marker On The Site:		0

J42 **BILL MUNCYS SERVICE** **LUST U001148462**
North **423 MILLER AVE** **UST N/A**
1/8-1/4 **ANN ARBOR, MI 48103** **WDS**
0.213 mi.
1127 ft. **Site 2 of 2 in cluster J**

Relative:
Lower

Actual:
798 ft.

LUST:

Facility ID:	00037093
Source:	STATE OF MICHIGAN
Owner Name:	Bill Muncys Serv
Owner Address:	423 Miller Ave
Owner City,St,Zip:	Ann Arbor, MI 48103-3339
Owner Contact:	Not reported
Owner Phone:	(734) 994-0873
Country:	USA
District:	Jackson District Office
Site Name:	Bill Muncys Service
Latitude:	42.28363
Longitude:	-83.75263
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET

BILL MUNCYS SERVICE (Continued) **U001148462**

Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)

Leak Number: C-0073-99
Release Date: 02/02/1999
Substance Released: Unknown,Unknown
Release Status: Closed
Release Closed Date: 01/14/2000

UST:
Facility ID: 00037093
Facility Type: CLOSED
Latitude: 42.28363
Longitude: -83.75263
Owner Name: BILL MUNCYS SERV
Owner Address: 423 MILLER AVE
Owner City,St,Zip: ANN ARBOR, MI 48103-3339
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (734) 994-0873
Contact: WM E MUNCY
Contact Phone: (734) 994-0873
Date of Collection: 01/11/2001
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Datum: NAD83
Source: STATE OF MICHIGAN
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)
Method of Collection: Address Matching-House Number

Tank ID: 1
Tank Status: Closed in Ground
Capacity: 500
Install Date: Not reported
Product: Used Oil
Remove Date: 01/25/1999
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel
Piping Type: Suction: No Valve At Tank
Construction Material: Not reported
Impressed Device: No

WDS:
Site Id: MIG000010499
WMD Id: 457070
Site Specific Name: BILL MUNCY SERVICE
Mailing Address: 423 MILLER AVE
Mailing City/State/Zip: 48103
Mailing County: WASHTENAW

43
NE
1/8-1/4
0.219 mi.
1157 ft.

SHEESH
207 N MAIN ST
ANN ARBOR, MI 48154

RCRA-CESQG **1014924556**
MIK200922417

Relative:
Higher

Actual:
832 ft.

RCRA-CESQG:

Date form received by agency:	04/11/2011
Facility name:	SHEESH
Facility address:	207 N MAIN ST ANN ARBOR, MI 48154
EPA ID:	MIK200922417
Contact:	KHALED HAIBAI
Contact address:	Not reported Not reported
Contact country:	Not reported
Contact telephone:	(734) 779-0000
Contact email:	SEAN.KELLY@WASTE365.COM
EPA Region:	05
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	SHEESH
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	04/04/2011
Owner/Op end date:	Not reported

Owner/operator name:	SHEESH
Owner/operator address:	Not reported Not reported
Owner/operator country:	Not reported
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	04/04/2011
Owner/Op end date:	Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No

SHEESH (Continued) **1014924556**

Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Hazardous Waste Summary:

Waste code:	D001
Waste name:	IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Violation Status:	No violations found

K44 **MAIN STREET GAS STATION** **LUST U000266408**
SSE **428 SOUTH MAIN** **UST N/A**
1/8-1/4 **ANN ARBOR, MI 48107**
0.233 mi.
1232 ft. **Site 1 of 2 in cluster K**

Relative:
Higher

Actual:
837 ft.

LUST:

Facility ID:	00033752
Source:	STATE OF MICHIGAN
Owner Name:	City of Ann Arbor
Owner Address:	PO Box 8647 100 N Fifth Ave
Owner City,St,Zip:	Ann Arbor, MI 48107
Owner Contact:	Not reported
Owner Phone:	(734) 794-6000
Country:	USA
District:	Jackson District Office
Site Name:	Main Street Gas Station
Latitude:	42.27729
Longitude:	-83.74899
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-2113-91
Release Date:	10/18/1991
Substance Released:	Unknown,Unknown
Release Status:	Closed

MAIN STREET GAS STATION (Continued) **U000266408**

Release Closed Date: 09/21/1992

UST:

Facility ID:	00033752
Facility Type:	CLOSED
Latitude:	42.27729
Longitude:	-83.74899
Owner Name:	CITY OF ANN ARBOR
Owner Address:	PO BOX 8647 100 N FIFTH AVE
Owner City,St,Zip:	ANN ARBOR, MI 48107
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(734) 794-6000
Contact:	DANIEL J. CULLEN
Contact Phone:	(734) 994-6696
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number

Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	5000
Install Date:	Not reported
Product:	UNK
Remove Date:	02/14/1992
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel
Impressed Device:	No

Tank ID:	2
Tank Status:	**Removed from Ground**
Capacity:	1500
Install Date:	Not reported
Product:	UNK
Remove Date:	02/14/1992
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel
Impressed Device:	No

Tank ID:	3
Tank Status:	**Removed from Ground**
Capacity:	1500
Install Date:	Not reported
Product:	UNKNOWN
Remove Date:	02/14/1992

MAIN STREET GAS STATION (Continued) **U000266408**

Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Unknown
Impressed Device: No

Tank ID: 4
Tank Status: Removed from Ground
Capacity: 1500
Install Date: Not reported
Product: UNKNOWN
Remove Date: 02/14/1992
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Unknown
Impressed Device: No

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45 **BEA** **S108084201**
NE **110 MILLER** **N/A**
1/8-1/4 **ANN ARBOR CITY, MI**
0.237 mi.
1254 ft.

Relative:
Higher

Actual:
819 ft.

BEA:
Secondary Address: Not reported
BEA Number: 335
District: Jackson
Date Received: 01/04/2002
Submitter Name: Ann Arbor Real Estate Group LLC
Petition Determination: Affirmed
Petition Disclosure: 1
Category: No Hazardous Substance(s)
Determination 20107A: Affirmed
Reviewer: katkov
Division Assigned: Environmental Response Division

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46 **2020 COMMUNICATIONS** **RCRA NonGen / NLR** **1010320772**
ENE **106 N 4TH AVE** **MIK738994573**
1/8-1/4 **ANN ARBOR, MI 48104**
0.249 mi.
1317 ft.

Relative:
Higher

Actual:
842 ft.

RCRA NonGen / NLR:
Date form received by agency: 06/19/2007
Facility name: 2020 COMMUNICATIONS
Facility address: 106 N 4TH AVE
ANN ARBOR, MI 48104
EPA ID: MIK738994573
Contact: MARK SMITH
Contact address: 106 N 4TH AVE
ANN ARBOR, MI 48104
Contact country: US

2020 COMMUNICATIONS (Continued) **1010320772**

Contact telephone: (734) 327-5416
Contact email: Not reported
EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: MARK MCCLEARY
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 01/01/2006
Owner/Op end date: Not reported

Owner/operator name: MARK SMITH
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 01/01/2006
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 05/05/2006
Facility name: 2020 COMMUNICATIONS
Classification: Small Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET,

2020 COMMUNICATIONS (Continued) **1010320772**

WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

L47 **BEA** **S112087712**
SSE **507-511 S. ASHLEY** **N/A**
1/8-1/4 **ANN ARBOR CITY, MI 48103**
0.249 mi.
1317 ft. **Site 1 of 2 in cluster L**

Relative:
Higher

Actual:
820 ft.

BEA:

Secondary Address:	Not reported
BEA Number:	1186
District:	Jackson
Date Received:	07/30/2012
Submitter Name:	AQRE529, LLC
Petition Determination:	No Request
Petition Disclosure:	0
Category:	Not reported
Determination 20107A:	No Request
Reviewer:	hisket
Division Assigned:	RD

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48 **UNIVERSITY FUEL MART** **LUST** **U003866613**
NE **300 N MAIN ST** **UST** **N/A**
1/4-1/2 **ANN ARBOR, MI 48104** **WDS**
0.261 mi.
1378 ft.

Relative:
Higher

Actual:
824 ft.

LUST:

Facility ID:	00005725
Source:	STATE OF MICHIGAN
Owner Name:	Baydoun Ann Arbor LLC
Owner Address:	300 N Main St
Owner City,St,Zip:	Ann Arbor, MI 48104
Owner Contact:	Not reported
Owner Phone:	734-747-8210
Country:	USA
District:	Jackson District Office
Site Name:	Amoco Station #5172
Latitude:	42.28339
Longitude:	-83.74827
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0372-92
Release Date:	03/03/1992
Substance Released:	Gasoline
Release Status:	Closed
Release Closed Date:	10/10/1996

UNIVERSITY FUEL MART (Continued) **U003866613**

UST:

Facility ID:	00005725
Facility Type:	ACTIVE
Latitude:	42.28339
Longitude:	-83.74827
Owner Name:	BAYDOUN ANN ARBOR LLC
Owner Address:	300 N MAIN ST
Owner City,St,Zip:	ANN ARBOR, MI 48104
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	734-747-8210
Contact:	Abdoulh Baydoun
Contact Phone:	313-747-8210
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number
Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	6000
Install Date:	04/28/1958
Product:	Gasoline
Remove Date:	11/01/1988
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Galvanized Steel
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel,Cathodically Protected Steel,Lined Interier
Impressed Device:	No
Tank ID:	2
Tank Status:	**Removed from Ground**
Capacity:	6000
Install Date:	04/28/1962
Product:	Gasoline
Remove Date:	05/24/2003
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Flexible Piping, Enviroflex
Piping Type:	Pressure
Construction Material:	Cathodically Protected Steel, Lined Interior
Impressed Device:	Yes
Tank ID:	3
Tank Status:	**Removed from Ground**
Capacity:	8000
Install Date:	04/28/1984
Product:	Gasoline
Remove Date:	05/24/2003

UNIVERSITY FUEL MART (Continued) **U003866613**

Tank Release Detection: Automatic Tank Gauging
Pipe Realease Detection: Automatic Line Leak Detectors
Piping Material: Flexible Piping
Piping Type: Pressure
Construction Material: Cathodically Protected Steel, Lined Interior
Impressed Device: Yes

Tank ID: 4
Tank Status: Removed from Ground
Capacity: 10000
Install Date: 04/28/1970
Product: Gasoline
Remove Date: 05/23/2003
Tank Release Detection: Automatic Tank Gauging
Pipe Realease Detection: Automatic Line Leak Detectors
Piping Material: Flexible Piping
Piping Type: Pressure
Construction Material: Cathodically Protected Steel, Lined Interior
Impressed Device: Yes

Tank ID: 5
Tank Status: Currently In Use
Capacity: 12000
Install Date: 05/30/2003
Product: Gasoline
Remove Date: Not reported
Tank Release Detection: Automatic Tank Gauging, Inter Monitoring Double Walled Tank, Tank Tightness Testing
Pipe Realease Detection: Automatic Line Leak Detectors, Interstitial Monitoring Double Walled Piping
Piping Material: Double Walled
Piping Type: Pressure
Construction Material: Double Walled, Fiberglass Reinforced plastic
Impressed Device: No

Tank ID: 6
Tank Status: Currently In Use
Capacity: 6000
Install Date: 05/30/2003
Product: Gasoline
Remove Date: Not reported
Tank Release Detection: Automatic Tank Gauging, Inter Monitoring Double Walled Tank, Tank Tightness Testing
Pipe Realease Detection: Automatic Line Leak Detectors, Interstitial Monitoring Double Walled Piping
Piping Material: Double Walled
Piping Type: Pressure
Construction Material: Double Walled, Fiberglass Reinforced plastic
Impressed Device: No

WDS:
Site Id: MID985607571
WMD Id: 404649
Site Specific Name: AMOCO OIL CO 5172

UNIVERSITY FUEL MART (Continued) **U003866613**

Mailing Address: P O BOX 352917
Mailing City/State/Zip: 43635
Mailing County: Not reported

L49 **A & L PARTS INC** **LUST U000714612**
SSE **521 S ASHLEY** **UST N/A**
1/4-1/2 **ANN ARBOR, MI 48104** **BEA**
0.266 mi.
1404 ft. **Site 2 of 2 in cluster L**

Relative: Higher

Actual: 819 ft.

LUST:

Facility ID:	00015177
Source:	STATE OF MICHIGAN
Owner Name:	A & L Parts Inc
Owner Address:	529 S Main St
Owner City,St,Zip:	Ann Arbor, MI 48104-2920
Owner Contact:	Not reported
Owner Phone:	(734) 665-4411
Country:	USA
District:	Jackson District Office
Site Name:	A&l Parts
Latitude:	42.27567
Longitude:	-83.74987
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0564-92
Release Date:	04/08/1992
Substance Released:	Not reported
Release Status:	Closed
Release Closed Date:	11/12/1992

UST:

Facility ID:	00015177
Facility Type:	CLOSED
Latitude:	42.27567
Longitude:	-83.74987
Owner Name:	A & L PARTS INC
Owner Address:	529 S MAIN ST
Owner City,St,Zip:	ANN ARBOR, MI 48104-2920
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(734) 665-4411
Contact:	ROBERT WINKLE
Contact Phone:	(734) 665-4411
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number

A & L PARTS INC (Continued) **U000714612**

Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	6000
Install Date:	04/07/1976
Product:	Gasoline
Remove Date:	04/08/1992
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Galvanized Steel
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel,Cathodically Protected Steel
Impressed Device:	No

Tank ID:	2
Tank Status:	**Removed from Ground**
Capacity:	6000
Install Date:	04/07/1976
Product:	Gasoline
Remove Date:	04/08/1992
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Galvanized Steel
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel,Cathodically Protected Steel
Impressed Device:	No

BEA:

Secondary Address:	Not reported
BEA Number:	577
District:	Jackson
Date Received:	09/29/2004
Submitter Name:	Morningside Ann Arbor LLC
Petition Determination:	Affirmed
Petition Disclosure:	1
Category:	No Hazardous Substance(s)
Determination 20107A:	No Request
Reviewer:	katkov
Division Assigned:	Environmental Response Division

K50 **BEA S106802581**
SSE **502 S MAIN ST** **N/A**
1/4-1/2 **ANN ARBOR CITY, MI 48103**
0.271 mi.
1431 ft. **Site 2 of 2 in cluster K**

Relative:
Higher

Actual:
833 ft.

BEA:

Secondary Address:	Not reported
BEA Number:	604
District:	Jackson
Date Received:	02/08/2005
Submitter Name:	502 S Main LLC
Petition Determination:	Affirmed
Petition Disclosure:	1
Category:	No Hazardous Substance(s)
Determination 20107A:	Affirmed
Reviewer:	katkov

(Continued) **S106802581**

Division Assigned: Environmental Response Division

M51 **CITY OF ANN ARBOR** **LUST U000266115**
East **100 NORTH 5TH AVENUE** **UST N/A**
1/4-1/2 **ANN ARBOR, MI 48107**
0.307 mi.
1619 ft. **Site 1 of 5 in cluster M**

Relative:
Higher

Actual:
848 ft.

LUST:

Facility ID:	00010246
Source:	STATE OF MICHIGAN
Owner Name:	City of Ann Arbor
Owner Address:	PO Box 8647 100 N Fifth Ave
Owner City,St,Zip:	Ann Arbor, MI 48107
Owner Contact:	Not reported
Owner Phone:	(734) 794-6000
Country:	USA
District:	Jackson District Office
Site Name:	City Hall
Latitude:	42.28222
Longitude:	-83.74487
Date of Collection:	03/13/2002
Method of Collection:	GPS Code Meas. Standard Positioning Service SA Off
Accuracy:	10
Accuracy Value Unit:	METERS
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0155-11
Release Date:	09/28/2011
Substance Released:	Diesel
Release Status:	Closed
Release Closed Date:	01/30/2012

UST:

Facility ID:	00010246
Facility Type:	CLOSED
Latitude:	42.28222
Longitude:	-83.74487
Owner Name:	CITY OF ANN ARBOR
Owner Address:	PO BOX 8647 100 N FIFTH AVE
Owner City,St,Zip:	ANN ARBOR, MI 48107
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(734) 794-6000
Contact:	D L Dunn
Contact Phone:	(734) 994-2815
Date of Collection:	03/13/2002
Accuracy:	10
Accuracy Value Unit:	METERS
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	GPS Code Meas. Standard Positioning Service SA Off
Tank ID:	1

CITY OF ANN ARBOR (Continued) **U000266115**

Tank Status:	**Removed from Ground**
Capacity:	8300
Install Date:	04/11/1966
Product:	Diesel
Remove Date:	09/15/1991
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel
Impressed Device:	No

Tank ID:	2
Tank Status:	**Removed from Ground**
Capacity:	3000
Install Date:	09/15/1991
Product:	Diesel
Remove Date:	09/21/2011
Tank Release Detection:	Automatic Tank Gauging,Inter Monitoring Double Walled Tank
Pipe Realease Detection:	Interstitial Monitoring/Second Containment
Piping Material:	Double Walled
Piping Type:	Suction: Valve at Tank
Construction Material:	Double Walled
Impressed Device:	No

M52 **CITY OF ANN ARBOR FIRE DEPT** **RCRA-CESQG** **1000828449**
East **111 N 5TH AVE** **FINDS** **MID985655208**
1/4-1/2 **ANN ARBOR, MI 48104** **LUST**
0.307 mi. **UST**
1619 ft. **Site 2 of 5 in cluster M** **WDS**

Relative:
Higher

Actual:
847 ft.

RCRA-CESQG:

Date form received by agency:	09/19/2007
Facility name:	CITY OF ANN ARBOR FIRE DEPT
Facility address:	111 N 5TH AVE ANN ARBOR, MI 48104
EPA ID:	MID985655208
Contact:	MIKE MASTEN
Contact address:	111 N 5TH AVE ANN ARBOR, MI 48104
Contact country:	US
Contact telephone:	(734) 994-2773
Contact email:	Not reported
EPA Region:	05
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from

CITY OF ANN ARBOR FIRE DEPT (Continued) **1000828449**

the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: CITY OF ANN ARBOR FIRE DEPT
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Municipal
Owner/Operator Type: Operator
Owner/Op start date: 01/01/1978
Owner/Op end date: Not reported

Owner/operator name: CITY OF ANN ARBOR FIRE DEPT
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Municipal
Owner/Operator Type: Owner
Owner/Op start date: 01/01/1978
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 12/31/2001
Facility name: CITY OF ANN ARBOR FIRE DEPT
Classification: Not a generator, verified

Date form received by agency: 12/23/1992
Facility name: CITY OF ANN ARBOR FIRE DEPT
Classification: Small Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE

CITY OF ANN ARBOR FIRE DEPT (Continued) **1000828449**

FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110009393398

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

LUST:

Facility ID:	00012808
Source:	STATE OF MICHIGAN
Owner Name:	City Of Ann Arbor
Owner Address:	111 N 5th Ave
Owner City,St,Zip:	Ann Arbor, MI 48104-1405
Owner Contact:	Not reported
Owner Phone:	(734) 994-2772
Country:	USA
District:	Jackson District Office
Site Name:	Ann Arbor Fire Station #1
Latitude:	42.28154
Longitude:	-83.74628
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-1558-92
Release Date:	09/10/1992
Substance Released:	Diesel
Release Status:	Closed
Release Closed Date:	11/25/1992

UST:

Facility ID:	00012808
Facility Type:	CLOSED
Latitude:	42.28154
Longitude:	-83.74628
Owner Name:	CITY OF ANN ARBOR
Owner Address:	111 N 5TH AVE
Owner City,St,Zip:	ANN ARBOR, MI 48104-1405
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(734) 994-2772

CITY OF ANN ARBOR FIRE DEPT (Continued) **1000828449**

Contact:	DENNIS HASLEY
Contact Phone:	(734) 994-4907
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number

Tank ID:	1
Tank Status:	**Closed in Ground**
Capacity:	300
Install Date:	03/19/1977
Product:	Used Oil
Remove Date:	09/15/1991
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Galvanized Steel
Piping Type:	Not reported
Construction Material:	Fiberglass Reinforced plastic,Lined Interier
Impressed Device:	No

Tank ID:	2
Tank Status:	**Removed from Ground**
Capacity:	1000
Install Date:	03/19/1977
Product:	Gasoline
Remove Date:	08/08/1992
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Galvanized Steel
Piping Type:	Suction: No Valve At Tank
Construction Material:	Fiberglass Reinforced plastic,Lined Interier
Impressed Device:	No

Tank ID:	3
Tank Status:	**Removed from Ground**
Capacity:	3000
Install Date:	03/19/1977
Product:	Diesel,DIESEL
Remove Date:	08/08/1992
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Galvanized Steel
Piping Type:	Suction: No Valve At Tank
Construction Material:	Fiberglass Reinforced plastic,Lined Interier
Impressed Device:	No

WDS:

Site Id:	MID985655208
WMD Id:	408074
Site Specific Name:	CITY OF ANN ARBOR FIRE DEPT
Mailing Address:	111 N 5TH AVE

CITY OF ANN ARBOR FIRE DEPT (Continued) **1000828449**

Mailing City/State/Zip: 48104
Mailing County: WASHTENAW

M53 **COMERICA BANK** **LUST U000715355**
East **300 E HURON ST** **UST N/A**
1/4-1/2 **ANN ARBOR, MI 48226**
0.308 mi.
1625 ft. **Site 3 of 5 in cluster M**

Relative:
Higher

Actual:
848 ft.

LUST:

Facility ID:	00035726
Source:	STATE OF MICHIGAN
Owner Name:	Comerica Inc
Owner Address:	211 W FORT ST
Owner City,St,Zip:	DETROIT, MI 48226
Owner Contact:	Not reported
Owner Phone:	(313) 788-5697
Country:	USA
District:	Jackson District Office
Site Name:	Comerica Bank Property
Latitude:	42.28118
Longitude:	-83.74563
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0439-85
Release Date:	10/08/1991
Substance Released:	Not reported
Release Status:	Closed
Release Closed Date:	03/24/1993

UST:

Facility ID:	00035726
Facility Type:	CLOSED
Latitude:	42.28118
Longitude:	-83.74563
Owner Name:	COMERICA INC
Owner Address:	211 W FORT ST
Owner City,St,Zip:	DETROIT, MI 48226
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(313) 788-5697
Contact:	ROBERT L. EDER
Contact Phone:	(517) 788-5697
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number

COMERICA BANK (Continued) **U000715355**

Tank ID: 1
Tank Status: Removed from Ground
Capacity: 1000
Install Date: 01/01/1974
Product: Gasoline
Remove Date: 09/24/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Suction: No Valve At Tank
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 2
Tank Status: Removed from Ground
Capacity: 1000
Install Date: 01/01/1974
Product: Gasoline
Remove Date: 09/24/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 3
Tank Status: Removed from Ground
Capacity: 3000
Install Date: 01/01/1974
Product: Gasoline
Remove Date: 09/24/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Galvanized Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 4
Tank Status: Removed from Ground
Capacity: 1000
Install Date: Not reported
Product: Heating Oil
Remove Date: 10/10/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel
Piping Type: Suction: No Valve At Tank
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 5

COMERICA BANK (Continued) **U000715355**

Tank Status:	**Removed from Ground**
Capacity:	1000
Install Date:	Not reported
Product:	Used Oil
Remove Date:	10/10/1991
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Bare Steel
Piping Type:	Suction: No Valve At Tank
Construction Material:	Asphalt Coated or Bare Steel
Impressed Device:	No

M54 **COMERICA BANK** **LUST U000715327**
East **312-314 E HURON** **UST N/A**
1/4-1/2 **ANN ARBOR, MI 48326** **WDS**
0.320 mi.
1688 ft. **Site 4 of 5 in cluster M**

Relative:
Higher

Actual:
850 ft.

LUST:

Facility ID:	00035696
Source:	STATE OF MICHIGAN
Owner Name:	Comerica Bank
Owner Address:	3501 Hamlin Rd MC 2220
Owner City,St,Zip:	Auburn Hills, MI 48326
Owner Contact:	Maureen Jordan
Owner Phone:	(248) 371-5203
Country:	USA
District:	Jackson District Office
Site Name:	Comerica Bank
Latitude:	42.28118
Longitude:	-83.74545
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-2100-91
Release Date:	10/09/1991
Substance Released:	Unknown
Release Status:	Closed
Release Closed Date:	03/24/1993

UST:

Facility ID:	00035696
Facility Type:	CLOSED
Latitude:	42.28118
Longitude:	-83.74545
Owner Name:	COMERICA BANK
Owner Address:	3501 HAMLIN RD MC 2220
Owner City,St,Zip:	AUBURN HILLS, MI 48326
Owner Country:	USA
Owner Contact:	Maureen Jordan
Owner Phone:	(248) 371-5203
Contact:	Robert L Eder
Contact Phone:	(517) 788-5697

COMERICA BANK (Continued) **U000715327**

Date of Collection: 01/11/2001
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Datum: NAD83
Source: STATE OF MICHIGAN
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)
Method of Collection: Address Matching-House Number

Tank ID: 1
Tank Status: Removed from Ground
Capacity: 1500
Install Date: Not reported
Product: Used Oil
Remove Date: 09/24/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel
Piping Type: Suction: No Valve At Tank
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 2
Tank Status: Removed from Ground
Capacity: 1500
Install Date: Not reported
Product: Used Oil
Remove Date: 09/24/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel
Piping Type: Suction: No Valve At Tank
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

WDS:
Site Id: MIP200000569
WMD Id: 436033
Site Specific Name: COMERICA INC
Mailing Address: 312-314 N HURON ST
Mailing City/State/Zip: 48104
Mailing County: WASHTENAW

M55 **ANN ARBOR CO** **LUST U000266343**
East **324 E HURON ST** **UST N/A**
1/4-1/2 **ANN ARBOR, MI 48104** **WDS**
0.331 mi.
1750 ft. **Site 5 of 5 in cluster M**

Relative:
Higher

Actual:
851 ft.

LUST:
Facility ID: 00011653
Source: STATE OF MICHIGAN
Owner Name: AT&T Michigan
Owner Address: 308 S Akard Ste 1700
Owner City,St,Zip: Dallas, TX 75202-5399
Owner Contact: Lisa Espinosa

ANN ARBOR CO (Continued) **U000266343**

Owner Phone:	(800) 566-9347
Country:	USA
District:	Jackson District Office
Site Name:	Michigan Bell Telephone
Latitude:	42.28132
Longitude:	-83.74544
Date of Collection:	10/21/2003
Method of Collection:	GPS Code Meas. Standard Positioning Service SA Off
Accuracy:	10
Accuracy Value Unit:	METERS
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-2440-91
Release Date:	11/20/1991
Substance Released:	Unknown,Unknown
Release Status:	Closed
Release Closed Date:	11/16/1992

UST:

Facility ID:	00011653
Facility Type:	ACTIVE
Latitude:	42.28132
Longitude:	-83.74544
Owner Name:	AT&T MICHIGAN
Owner Address:	308 S AKARD STE 1700
Owner City,St,Zip:	DALLAS, TX 75202-5399
Owner Country:	USA
Owner Contact:	Lisa Espinosa
Owner Phone:	(800) 566-9347
Contact:	Envrionmental Management (Cheryl Allen)
Contact Phone:	(866) 492-6836
Date of Collection:	10/21/2003
Accuracy:	10
Accuracy Value Unit:	METERS
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	GPS Code Meas. Standard Positioning Service SA Off
Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	15000
Install Date:	05/08/1968
Product:	Diesel
Remove Date:	11/15/1991
Tank Release Detection:	Automatic Tank Gauging,Manual Tank Gauging
Pipe Realease Detection:	Interstitial Monitoring/Second Containment
Piping Material:	Cathodically Protected
Piping Type:	Suction: Valve at Tank
Construction Material:	Asphalt Coated or Bare Steel,Cathodically Protected Steel
Impressed Device:	No
Tank ID:	2
Tank Status:	**Removed from Ground**

ANN ARBOR CO (Continued) **U000266343**

Capacity:	15000
Install Date:	05/08/1968
Product:	Diesel
Remove Date:	11/15/1991
Tank Release Detection:	Automatic Tank Gauging,Manual Tank Gauging
Pipe Realease Detection:	Interstitial Monitoring/Second Containment
Piping Material:	Cathodically Protected
Piping Type:	Suction: Valve at Tank
Construction Material:	Asphalt Coated or Bare Steel,Cathodically Protected Steel
Impressed Device:	No

Tank ID:	3
Tank Status:	**Removed from Ground**
Capacity:	6000
Install Date:	05/08/1976
Product:	Kerosene
Remove Date:	07/09/1991
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel,Cathodically Protected Steel
Impressed Device:	No

Tank ID:	4
Tank Status:	**Currently In Use**
Capacity:	20000
Install Date:	05/14/1992
Product:	Kerosene
Remove Date:	Not reported
Tank Release Detection:	Automatic Tank Gauging,Inter Monitoring Double Walled Tank,Inter Monitoring/Second Containment,Inventory Control,Tank Tightness Testing,Vapor Monitoring
Pipe Realease Detection:	Not reported
Piping Material:	Double Walled,Fiberglass reinforced plastic,Secondary Containment
Piping Type:	Suction: Valve at Tank
Construction Material:	Double Walled,Fiberglass Reinforced plastic
Impressed Device:	No

WDS:

Site Id:	MIT270011018
WMD Id:	414461
Site Specific Name:	AMERITECH CORP
Mailing Address:	105 E BETHUNE ST
Mailing City/State/Zip:	48202
Mailing County:	WAYNE

56
NNE
1/4-1/2
0.352 mi.
1856 ft.

BEAKES STREET SERVICE STATION
101 BEAKES ST
ANN ARBOR, MI 48107

LUST **U000266122**
UST **N/A**

Relative:
Higher

Actual:
813 ft.

LUST:

Facility ID:	00010245
Source:	STATE OF MICHIGAN
Owner Name:	City of Ann Arbor
Owner Address:	PO Box 8647 100 N Fifth Ave
Owner City,St,Zip:	Ann Arbor, MI 48107
Owner Contact:	Not reported
Owner Phone:	(734) 794-6000
Country:	USA
District:	Jackson District Office
Site Name:	Beakes St
Latitude:	42.28506
Longitude:	-83.74831
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0587-89
Release Date:	09/27/1989
Substance Released:	Not reported
Release Status:	Closed
Release Closed Date:	08/23/1994

UST:

Facility ID:	00010245
Facility Type:	CLOSED
Latitude:	42.28506
Longitude:	-83.74831
Owner Name:	CITY OF ANN ARBOR
Owner Address:	PO BOX 8647 100 N FIFTH AVE
Owner City,St,Zip:	ANN ARBOR, MI 48107
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(734) 794-6000
Contact:	DANIEL J. CULLEN
Contact Phone:	(734) 994-6696
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number
Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	2000
Install Date:	04/11/1956
Product:	Gasoline

BEAKES STREET SERVICE STATION (Continued) **U000266122**

Remove Date: 09/27/1989
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 2
Tank Status: Removed from Ground
Capacity: 4000
Install Date: 04/11/1956
Product: Gasoline
Remove Date: 09/27/1989
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 3
Tank Status: Removed from Ground
Capacity: 3000
Install Date: 04/11/1956
Product: Gasoline
Remove Date: 09/27/1989
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Unknown
Impressed Device: No

Tank ID: 4
Tank Status: Removed from Ground
Capacity: 500
Install Date: 04/11/1956
Product: FUEL OIL
Remove Date: 09/27/1989
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Unknown
Impressed Device: No

Tank ID: 5
Tank Status: Removed from Ground
Capacity: 2000
Install Date: 04/11/1956
Product: Used Oil
Remove Date: 09/27/1989

BEAKES STREET SERVICE STATION (Continued) **U000266122**

Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Unknown
Impressed Device: No

57
SSE
1/4-1/2
0.362 mi.
1911 ft.

551 S FOURTH
ANN ARBOR CITY, MI 48104

BEA **S110300723**
N/A

Relative:
Higher

Actual:
833 ft.

BEA:
Secondary Address: Not reported
BEA Number: 1020
District: Jackson
Date Received: 03/17/2010
Submitter Name: Prestige Properties Ann Arbor LLC
Petition Determination: Affirmed
Petition Disclosure: 1
Category: No Hazardous Substance(s)
Determination 20107A: No Request
Reviewer: katkov
Division Assigned: RRD

58
NE
1/4-1/2
0.366 mi.
1932 ft.

DE LONG BBQ PIT
314 DETROIT ST
ANN ARBOR, MI 48104

LUST **U003790732**
UST **N/A**
AUL
BEA
WDS

Relative:
Higher

Actual:
832 ft.

LUST:
Facility ID: 00040666
Source: STATE OF MICHIGAN
Owner Name: Mav Corporation
Owner Address: 484 Deer Street
Owner City,St,Zip: Plymouth, MI 48170
Owner Contact: Not reported
Owner Phone: (734) 930-6700
Country: USA
District: Jackson District Office
Site Name: De Long Bbq Pit
Latitude: 42.28385
Longitude: -83.74625
Date of Collection: 10/05/2004
Method of Collection: Address Matching-House Number
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)

Leak Number: C-0160-01
Release Date: 03/14/2001
Substance Released: Other

DE LONG BBQ PIT (Continued) **U003790732**

Release Status: Closed
Release Closed Date: 08/07/2001

UST:
Facility ID: 00040666
Facility Type: CLOSED
Latitude: 42.28385
Longitude: -83.74625
Owner Name: MAV CORPORATION
Owner Address: 484 DEER STREET
Owner City,St,Zip: PLYMOUTH, MI 48170
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (734) 930-6700
Contact: ROB ALDRICH
Contact Phone: (734) 930-6700
Date of Collection: 10/05/2004
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Datum: NAD83
Source: STATE OF MICHIGAN
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)
Method of Collection: Address Matching-House Number

Tank ID: 1
Tank Status: Removed from Ground
Capacity: 1500
Install Date: Not reported
Product: Gasoline
Remove Date: 05/21/2001
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 2
Tank Status: Removed from Ground
Capacity: 1500
Install Date: Not reported
Product: Gasoline
Remove Date: 05/21/2001
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 3
Tank Status: Removed from Ground
Capacity: 10000
Install Date: Not reported
Product: Gasoline

DE LONG BBQ PIT (Continued) **U003790732**

Remove Date: 05/21/2001
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 4
Tank Status: Closed in Ground
Capacity: 1500
Install Date: Not reported
Product: Gasoline
Remove Date: 06/16/2002
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

AUL:
Status: Recorded
Site Name: Not reported
Property: Delong BBQ Pit
Land Use Restriction Type: NCA
Program Type: Part 213
Program Support Assigned User: Nicholas Swartz
Program Support Assigned Date: 5/15/2009 12:05:03.167
Legal Description Of Property: Not reported
Based On The Deq Ref #: 12121304282
MDEQ Reference Number: NCA-RRD-213-04-282
Property Or Description Restricted Area: DeLong BBQ Pit
Lead Division: STD
File Name Of Hyperlinked Legal Doc: U:\\KERMIT\\12121304282.pdf
Mapped Polygons Area In Acres: 5.3800000000000001E-2
Mapped Polygons Area In Square Miles: 0.0001
Date Data Entry Started: 5/15/2009 00:00:00
Date Data Entry Finished: 5/15/2009 00:00:00
Individual Or Staff Assoc With The Mapping: Nicholas Swartz
Program Used To Map Restricted Features: ArcInfo 9.3 and IcoMap 4.2
Map Comments: Property polygon is NOT mapped in KERMIT as of 10/09/2008. LUR is mapped in KERMIT as of 20090515 - Nick Swartz
Comment: Request received on 7/16/2004. 6/26/08, C&E Section received corrected copies. 8/13/2008, Linda scanned for plotting and linking.
Date Legal Paperwork Stamped/Filed/Register Of Deeds: 7/23/2001 00:00:00
Commercial I Land Use Restriction: 0
Commercial Ii Land Use Restriction: 0
Commercial Iii Land Use Restriction: 1
Commercial Iv Land Use Restriction: 1
Industrial Land Use Restriction: 0
Residential Land Use Restriction: 0
Recreational Land Use Restriction: 0
Multiple Land-Use Restrictions: 0
Site Specific Restrictions: 0
Groundwater Consumption Restrictions: 0

DE LONG BBQ PIT (Continued) **U003790732**

Groundwater Contact Restrictions: 0
Special Well Construction Requirements: 0
Special Building Restrictions: 0
Excavation And Soil Movement Restrictions: 0
Soil Movement Requirements: 0
There Is A Restriction On All Construction: 0
Monitoring Well Protected, No Tampering Or Removal: 0
There Is An Exposure Barrier In Place: 0
There Is A Health And Safety Plan: 0
There Is A Permanent Marker On The Site: 0

BEA:
Secondary Address: Not reported
BEA Number: 279
District: Jackson
Date Received: 03/07/2001
Submitter Name: MAV Development Company
Petition Determination: Denied
Petition Disclosure: 1
Category: No Hazardous Substance(s)
Determination 20107A: No Request
Reviewer: massonp
Division Assigned: Storage Tank Division

WDS:
Site Id: MIK219723194
WMD Id: 463439
Site Specific Name: M A V DEVELOPMENT CO
Mailing Address: 314 DETROIT ST
Mailing City/State/Zip: 48104
Mailing County: WASHTENAW

N59 **MAIN MADISON PROPERTIES** **BEA S106096714**
SSE **552 - 564 S MAIN ST** **N/A**
1/4-1/2 **ANN ARBOR CITY, MI 48104**
0.366 mi.
1935 ft. **Site 1 of 4 in cluster N**

Relative:
Higher

Actual:
819 ft.

BEA:
Secondary Address: Not reported
BEA Number: 487
District: Jackson
Date Received: 09/19/2003
Submitter Name: Main Madison Center LLC
Petition Determination: No Request
Petition Disclosure: 0
Category: No Hazardous Substance(s)
Determination 20107A: No Request
Reviewer: hisket
Division Assigned: Storage Tank Division

N60 **JAPANESE AUTO** **LUST** **U003758793**
SSE **563 S MAIN ST** **UST** **N/A**
1/4-1/2 **ANN ARBOR, MI 48104** **WDS**
0.369 mi.
1949 ft. **Site 2 of 4 in cluster N**

Relative:
Higher

Actual:
819 ft.

LUST:

Facility ID:	00040309
Source:	STATE OF MICHIGAN
Owner Name:	City of Ann Arbor
Owner Address:	PO Box 8647 100 N Fifth Ave
Owner City,St,Zip:	Ann Arbor, MI 48107
Owner Contact:	Not reported
Owner Phone:	(734) 794-6000
Country:	USA
District:	Jackson District Office
Site Name:	Japanese Auto
Latitude:	42.27446
Longitude:	-83.74882
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-1301-99
Release Date:	01/04/2000
Substance Released:	Unknown,Unknown
Release Status:	Open
Release Closed Date:	Not reported

UST:

Facility ID:	00040309
Facility Type:	CLOSED
Latitude:	42.27446
Longitude:	-83.74882
Owner Name:	CITY OF ANN ARBOR
Owner Address:	PO BOX 8647 100 N FIFTH AVE
Owner City,St,Zip:	ANN ARBOR, MI 48107
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(734) 794-6000
Contact:	JANINE MUELLER
Contact Phone:	(734) 994-6095
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number
Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	2000
Install Date:	Not reported
Product:	Used Oil

JAPANESE AUTO (Continued) **U003758793**

Remove Date: 12/15/1999
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

WDS:
Site Id: MIG000016014
WMD Id: 455423
Site Specific Name: JAPANESE AUTO PRO SERVICE
Mailing Address: 563 S MAIN ST
Mailing City/State/Zip: 48104
Mailing County: WASHTENAW

O61 **ARMEN CLEANERS** **CERCLIS** **1006812544**
SSE **603 S. ASHLEY STREET** **MIN000508741**
1/4-1/2 **ANN ARBOR, MI 48103**
0.383 mi.
2022 ft. **Site 1 of 3 in cluster O**

Relative:
Higher

Actual:
821 ft.

CERCLIS:
Site ID: 0508741
EPA ID: MIN000508741
Facility County: WASHTENAW
Short Name: ARMEN CLEANERS
Congressional District: 15
IFMS ID: B56K
SMSA Number: Not reported
USGC Hydro Unit: Not reported
Federal Facility: Not a Federal Facility
DMNSN Number: 0.00000
Site Orphan Flag: Not reported
RCRA ID: Not reported
USGS Quadrangle: Not reported
Site Init By Prog: R
NFRAP Flag: Not reported
Parent ID: Not reported
RST Code: Not reported
EPA Region: 05
Classification: Not reported
Site Settings Code: Not reported
NPL Status: Not on the NPL
DMNSN Unit Code: Not reported
RBRAC Code: Not reported
RResp Fed Agency Code: Not reported
Non NPL Status: Removal Only Site (No Site Assessment Work Needed)
Non NPL Status Date: 02/03/03
Site Fips Code: 26161
CC Concurrence Date: Not reported
CC Concurrence FY: Not reported
Alias EPA ID: Not reported
Site FUDS Flag: Not reported

CERCLIS Site Contact Name(s):
Contact ID: 5272229.00000

ARMEN CLEANERS (Continued) **1006812544**

Contact Name: JON GULCH
Contact Tel: (734) 692-7686
Contact Title: On-Scene Coordinator (OSC)
Contact Email: Not reported

Alias Comments: Not reported
Site Description: Michigan Department of Environmental Quality (MDEQ) asked for assistance in performing a Site Assessment and possible Time Critical Removal. The site is an active commercial laundry facility that uses Tetracholoroethylene. MDEQ has conducted emergency response actions to mitigate indoor levels of PERC that are evaporating out of the groundwater beneath several houses.

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62 **CAMPUS AUTO** **LUST U002303282**
East **202 S DIVISION ST** **UST N/A**
1/4-1/2 **ANN ARBOR, MI 48104** **BEA**
0.387 mi.
2044 ft.

Relative:
Higher

Actual:
864 ft.

LUST:
Facility ID: 00038007
Source: STATE OF MICHIGAN
Owner Name: John P & Nancy W Donwes
Owner Address: 202 S Division St
Owner City,St,Zip: Ann Arbor, MI 48104-2202
Owner Contact: Not reported
Owner Phone: (734) 761-3768
Country: USA
District: Jackson District Office
Site Name: Campus Auto Rental
Latitude: 42.28018
Longitude: -83.74428
Date of Collection: 01/11/2001
Method of Collection: Address Matching-House Number
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)

Leak Number: C-1075-94
Release Date: 09/22/1994
Substance Released: Gasoline
Release Status: Closed
Release Closed Date: 02/27/1995

UST:
Facility ID: 00038007
Facility Type: CLOSED
Latitude: 42.28018
Longitude: -83.74428
Owner Name: JOHN P & NANCY W DONWES
Owner Address: 202 S DIVISION ST
Owner City,St,Zip: ANN ARBOR, MI 48104-2202
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (734) 761-3768
Contact: NANCY W DOWNES
Contact Phone: (734) 761-3768

CAMPUS AUTO (Continued) **U002303282**

Date of Collection: 01/11/2001
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Datum: NAD83
Source: STATE OF MICHIGAN
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)
Method of Collection: Address Matching-House Number

Tank ID: 1
Tank Status: Removed from Ground
Capacity: 2000
Install Date: Not reported
Product: Gasoline
Remove Date: 09/01/1994
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Unknown
Impressed Device: No

BEA:
Secondary Address: Not reported
BEA Number: 6
District: Jackson
Date Received: 10/09/1995
Submitter Name: Great Lakes Bancorp
Petition Determination: Affirmed
Petition Disclosure: 1
Category: No Hazardous Substance(s)
Determination 20107A: Pending
Reviewer: temppm
Division Assigned: Environmental Response Division

Secondary Address: Not reported
BEA Number: 611
District: Jackson
Date Received: 03/17/2005
Submitter Name: McKinley Financial Center LLC
Petition Determination: No Request
Petition Disclosure: 0
Category: No Hazardous Substance(s)
Determination 20107A: No Request
Reviewer: massonp
Division Assigned: Environmental Response Division

Secondary Address: Not reported
BEA Number: 612
District: Jackson
Date Received: 03/17/2005
Submitter Name: Division Street Parking LLC
Petition Determination: No Request
Petition Disclosure: 0
Category: No Hazardous Substance(s)
Determination 20107A: No Request
Reviewer: massonp

CAMPUS AUTO (Continued) **U002303282**

Division Assigned: Environmental Response Division

Secondary Address: Not reported
BEA Number: 613
District: Jackson
Date Received: 03/17/2005
Submitter Name: McKinley Financial Holdings LLC
Petition Determination: No Request
Petition Disclosure: 0
Category: No Hazardous Substance(s)
Determination 20107A: No Request
Reviewer: massonp
Division Assigned: Environmental Response Division

N63 **BRAUM FAMILY AGENCY** **LUST U003561591**
SSE **601 S MAIN ST** **UST N/A**
1/4-1/2 **ANN ARBOR, MI 48104** **WDS**
0.396 mi.
2091 ft. **Site 3 of 4 in cluster N**

Relative:
Higher

Actual:
819 ft.

LUST:
Facility ID: 00009879
Source: STATE OF MICHIGAN
Owner Name: Krishna Associates LLC
Owner Address: 5640 Haggerty Rd
Owner City,St,Zip: Canton, MI 48187
Owner Contact: Not reported
Owner Phone: (734) 981-4626
Country: USA
District: Jackson District Office
Site Name: Hop In #505
Latitude: 42.27370
Longitude: -83.74888
Date of Collection: 10/21/2003
Method of Collection: GPS Code Meas. Standard Positioning Service SA Off
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)

Leak Number: C-0381-94
Release Date: 04/26/1994
Substance Released: Gasoline
Release Status: Open
Release Closed Date: Not reported

UST:
Facility ID: 00039228
Facility Type: CLOSED
Latitude: 42.27385
Longitude: -83.74897
Owner Name: BRAUM FAMILY AGENCY
Owner Address: % BARBARA A BRAUN HAFNER 1932 BRIM DR
Owner City,St,Zip: TOLEDO, OH 43613
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (419) 259-8592

BRAUM FAMILY AGENCY (Continued) **U003561591**

Contact:	Cynthia K Jayson
Contact Phone:	(734) 769-8100
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number

Tank ID:	1
Tank Status:	**Closed in Ground**
Capacity:	550
Install Date:	Not reported
Product:	Used Oil
Remove Date:	10/09/1996
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel
Impressed Device:	No

Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	6000
Install Date:	04/28/1960
Product:	Gasoline
Remove Date:	09/01/1996
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Fiberglass reinforced plastic
Piping Type:	Pressure
Construction Material:	Asphalt Coated or Bare Steel,Lined Interier
Impressed Device:	No

Tank ID:	2
Tank Status:	**Removed from Ground**
Capacity:	6000
Install Date:	04/28/1960
Product:	Gasoline
Remove Date:	09/01/1996
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Fiberglass reinforced plastic
Piping Type:	Pressure
Construction Material:	Asphalt Coated or Bare Steel,Lined Interier
Impressed Device:	No

Tank ID:	3
Tank Status:	**Removed from Ground**
Capacity:	3000
Install Date:	04/28/1960

BRAUM FAMILY AGENCY (Continued) **U003561591**

Product: Gasoline
Remove Date: 09/01/1996
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Fiberglass reinforced plastic
Piping Type: Pressure
Construction Material: Asphalt Coated or Bare Steel,Lined Interier
Impressed Device: No

Tank ID: 4
Tank Status: **Removed from Ground**
Capacity: 3000
Install Date: 04/28/1960
Product: Gasoline
Remove Date: 09/01/1996
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Fiberglass reinforced plastic
Piping Type: Pressure
Construction Material: Asphalt Coated or Bare Steel,Lined Interier
Impressed Device: No

Tank ID: 5
Tank Status: **Removed from Ground**
Capacity: 2000
Install Date: 04/28/1960
Product: Gasoline
Remove Date: 09/01/1996
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Fiberglass reinforced plastic
Piping Type: Pressure
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 6
Tank Status: **Currently In Use**
Capacity: 6000
Install Date: 09/20/1996
Product: Gasoline
Remove Date: Not reported
Tank Release Detection: Automatic Tank Gauging, Inventory Control, Tank Tightness Testing
Pipe Realease Detection: Automatic Line Leak Detectors, Interstitial Monitoring Double Walled Piping
Piping Material: Double Walled, Fiberglass reinforced plastic
Piping Type: Pressure
Construction Material: Composite(Steel w/Fiberglass), Double Walled, Epoxy Coated Steel
Impressed Device: No

Tank ID: 7
Tank Status: **Currently In Use**
Capacity: 12000
Install Date: 09/20/1996

BRAUM FAMILY AGENCY (Continued) **U003561591**

Product:	Gasoline
Remove Date:	Not reported
Tank Release Detection:	Automatic Tank Gauging, Inter Monitoring Double Walled Tank, Inventory Control
Pipe Realease Detection:	Automatic Line Leak Detectors, Interstitial Monitoring Double Walled Piping
Piping Material:	Double Walled, Fiberglass reinforced plastic
Piping Type:	Pressure
Construction Material:	Composite(Steel w/Fiberglass), Double Walled, Epoxy Coated Steel
Impressed Device:	No

WDS:

Site Id:	MID985620996
WMD Id:	405952
Site Specific Name:	CLARK # 2119
Mailing Address:	3003 BUTTERFIELD RD
Mailing City/State/Zip:	60523
Mailing County:	Not reported

N64 **BEA** **U003561510**
SSE **601 S MAIN** **N/A**
1/4-1/2 **ANN ARBOR CITY, MI**
0.396 mi.
2091 ft. **Site 4 of 4 in cluster N**

Relative:
Higher

Actual:
819 ft.

BEA:

Secondary Address:	Not reported
BEA Number:	627
District:	Jackson
Date Received:	05/25/2005
Submitter Name:	Krishna Associates LLC
Petition Determination:	No Request
Petition Disclosure:	0
Category:	Same Hazardous Substance(s)
Determination 20107A:	No Request
Reviewer:	hisket
Division Assigned:	Storage Tank Division

P65 **DALE KRULL CONST** **LUST** **U001147611**
North **221 FELCH ST** **UST** **N/A**
1/4-1/2 **ANN ARBOR, MI 48108** **WDS**
0.402 mi.
2122 ft. **Site 1 of 4 in cluster P**

Relative:
Lower

Actual:
792 ft.

LUST:

Facility ID:	00036137
Source:	STATE OF MICHIGAN
Owner Name:	B & H Investments
Owner Address:	725 W Ellsworth Rd
Owner City,St,Zip:	Ann Arbor, MI 48108-3320
Owner Contact:	Not reported
Owner Phone:	(734) 769-6781
Country:	USA
District:	Jackson District Office
Site Name:	Saline Construction
Latitude:	42.28623

DALE KRULL CONST (Continued) **U001147611**

Longitude:	-83.75044
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0852-92
Release Date:	05/27/1992
Substance Released:	Diesel
Release Status:	Closed
Release Closed Date:	07/07/1993

UST:

Facility ID:	00036137
Facility Type:	CLOSED
Latitude:	42.28623
Longitude:	-83.75044
Owner Name:	B & H INVESTMENTS
Owner Address:	725 W ELLSWORTH RD
Owner City,St,Zip:	ANN ARBOR, MI 48108-3320
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(734) 769-6781
Contact:	JACOB W. HAAS
Contact Phone:	(734) 769-6781
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number
Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	5000
Install Date:	01/01/1975
Product:	Gasoline
Remove Date:	06/20/1996
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Suction: No Valve At Tank
Construction Material:	Asphalt Coated or Bare Steel
Impressed Device:	No

WDS:

Site Id:	MIG000037415
WMD Id:	444628
Site Specific Name:	B & H INVESTMENTS
Mailing Address:	221 FELCH ST
Mailing City/State/Zip:	48103
Mailing County:	WASHTENAW

DALE KRULL CONST (Continued) **U001147611**

Site Id: MIG000020878
WMD Id: 452925
Site Specific Name: J C BEAL
Mailing Address: 221 FELCH ST
Mailing City/State/Zip: 48103
Mailing County: WASHTENAW

O66 **ARMEN'S CLEANERS** **CERC-NFRAP** **1000206972**
SSE **630 S ASHLEY** **RCRA NonGen / NLR** **MID016708935**
1/4-1/2 **ANN ARBOR, MI 48103** **FINDS**
0.406 mi. **UST**
2142 ft. **Site 2 of 3 in cluster O**

Relative:
Higher

Actual:
823 ft.

CERC-NFRAP:
Site ID: 0502410
Federal Facility: Not a Federal Facility
NPL Status: Not on the NPL
Non NPL Status: NFRAP-Site does not qualify for the NPL based on existing information

Program Priority:
Description: Great Lakes

CERCLIS-NFRAP Assessment History:
Action: DISCOVERY
Date Started: Not reported
Date Completed: 12/31/1985
Priority Level: Not reported

Action: PRELIMINARY ASSESSMENT
Date Started: Not reported
Date Completed: 03/31/1986
Priority Level: Higher priority for further assessment

Action: SITE INSPECTION
Date Started: Not reported
Date Completed: 03/16/1990
Priority Level: NFRAP-Site does not qualify for the NPL based on existing information

Action: ARCHIVE SITE
Date Started: Not reported
Date Completed: 03/16/1990
Priority Level: Not reported

RCRA NonGen / NLR:
Date form received by agency: 12/29/2011
Facility name: ARMEN CLEANERS
Facility address: 630 S ASHLEY
ANN ARBOR, MI 48103
EPA ID: MID016708935
Mailing address: 630 S ASHLEY ST
ANN ARBOR, MI 48103
Contact: FRED AMARSI
Contact address: Not reported
Not reported
Contact country: Not reported
Contact telephone: (313) 663-4131

ARMEN'S CLEANERS (Continued) **1000206972**

Contact email: Not reported
EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 05/02/2009
Owner/Op end date: Not reported

Owner/operator name: NO ACTIVE O/OP AS NOT GENERATING WASTE
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 05/02/2009
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 10/03/1986
Facility name: ARMEN CLEANERS
Classification: Small Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE

ARMEN'S CLEANERS (Continued) **1000206972**

MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Violation Status: No violations found

FINDS:

Registry ID: 110003586129

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

CERCLIS (Comprehensive Environmental Response, Compensation, and Liability Information System) is the Superfund database that is used to support management in all phases of the Superfund program. The system contains information on all aspects of hazardous waste sites, including an inventory of sites, planned and actual site activities, and financial information.

UST:

Facility ID:	00012850
Facility Type:	ACTIVE
Latitude:	42.27358
Longitude:	-83.75020
Owner Name:	ARMEN CLEANERS INC
Owner Address:	630 S ASHLEY ST
Owner City,St,Zip:	ANN ARBOR, MI 48103-4908
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(734) 663-4131
Contact:	FRED AMARSI
Contact Phone:	(734) 663-4131
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number

Tank ID:	1
Tank Status:	**Temporarily out of Use**
Capacity:	1000
Install Date:	Not reported
Product:	Hazardous Substance
Remove Date:	Not reported
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Bare Steel,COPPER OUTLET
Piping Type:	Not reported

ARMEN'S CLEANERS (Continued) **1000206972**

Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

O67 **ARMEN CLEANERS** **SHWS** **S108228925**
SSE **630 S. ASHLEY STREET** **DRYCLEANERS** **N/A**
1/4-1/2 **ANN ARBOR, MI** **BROWNFIELDS**
0.406 mi. **WDS**
2142 ft. **Site 3 of 3 in cluster O**

Relative:
Higher

Actual:
823 ft.

SHWS:
Facility ID: 81000005
Facility Status: Interim Response in progress
Source: Not reported
SAM Score: 48
SAM Score Date: 08/18/2004
Township: 02S
Range: 06E
Section: 29
Quarter: SW
Quarter/Quarter: SE
Pollutants: PCE

DRYCLEANERS:
Establishment#: 8100025
DCM #: 1
DCM Type: Perc
Total lb: 35

Establishment#: 8100025
DCM #: 2
DCM Type: Petro
Total lb: 95

BROWNFIELD:
Facility ID: Not reported
Region: 1
Status: Not reported
Properry Use: Not reported
Use at Time of Listing: Not reported
BEA: No
Ernie Id Number: 81000005

WDS:
Site Id: MID016708935
WMD Id: 394498
Site Specific Name: ARMEN CLEANERS
Mailing Address: 630 S ASHLEY ST
Mailing City/State/Zip: 48103
Mailing County: WASHTENAW

P68 **ANN ARBOR ART CTR (FORMER STANDARD OIL)** **BEA** **S109416630**
NNE **220 FELCH** **N/A**
1/4-1/2 **ANN ARBOR CITY, MI**
0.408 mi.
2154 ft. **Site 2 of 4 in cluster P**

Relative:
Lower

Actual:
790 ft.

BEA:

Secondary Address:	Not reported
BEA Number:	949
District:	Jackson
Date Received:	01/15/2009
Submitter Name:	A2 Real Property Group LLC
Petition Determination:	Affirmed
Petition Disclosure:	1
Category:	No Hazardous Substance(s)
Determination 20107A:	No Request
Reviewer:	katkov
Division Assigned:	RRD

P69 **C.B DEVELOPMENT** **LUST** **U003082673**
NNE **220 FELCH ST** **UST** **N/A**
1/4-1/2 **ANN ARBOR, MI 48108**
0.409 mi.
2159 ft. **Site 3 of 4 in cluster P**

Relative:
Lower

Actual:
790 ft.

LUST:

Facility ID:	00020892
Source:	STATE OF MICHIGAN
Owner Name:	Cb Developement
Owner Address:	725 W Ellsworth Rd
Owner City,St,Zip:	Ann Arbor, MI 48108-3320
Owner Contact:	Not reported
Owner Phone:	(734) 769-6781
Country:	USA
District:	Jackson District Office
Site Name:	C.b Development
Latitude:	42.28651
Longitude:	-83.75064
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-0851-92
Release Date:	05/26/1992
Substance Released:	Diesel
Release Status:	Closed
Release Closed Date:	04/23/1997
Leak Number:	C-0856-92
Release Date:	05/28/1992
Substance Released:	Diesel
Release Status:	Closed
Release Closed Date:	04/23/1997
Leak Number:	C-0908-92
Release Date:	06/04/1992

C.B DEVELOPMENT (Continued) **U003082673**

Substance Released: Gasoline
Release Status: Closed
Release Closed Date: 04/23/1997

UST:
Facility ID: 00020892
Facility Type: CLOSED
Latitude: 42.28651
Longitude: -83.75064
Owner Name: CB DEVELOPEMENT
Owner Address: 725 W ELLSWORTH RD
Owner City,St,Zip: ANN ARBOR, MI 48108-3320
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (734) 769-6781
Contact: DONALD BUTCHER
Contact Phone: (734) 769-6781
Date of Collection: 01/11/2001
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Datum: NAD83
Source: STATE OF MICHIGAN
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)
Method of Collection: Address Matching-House Number

Tank ID: 1
Tank Status: Removed from Ground
Capacity: 500
Install Date: 05/11/1969
Product: Gasoline
Remove Date: 05/28/1992
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

Tank ID: 2
Tank Status: Removed from Ground
Capacity: 500
Install Date: Not reported
Product: Diesel
Remove Date: 05/28/1992
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Unknown
Piping Type: Not reported
Construction Material: Unknown
Impressed Device: No

Tank ID: 3
Tank Status: Removed from Ground
Capacity: 1000
Install Date: Not reported

C.B DEVELOPMENT (Continued) **U003082673**

Product:	Diesel
Remove Date:	05/28/1992
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Not reported
Construction Material:	Unknown
Impressed Device:	No

Tank ID:	4
Tank Status:	**Removed from Ground**
Capacity:	4000
Install Date:	Not reported
Product:	Diesel
Remove Date:	05/28/1992
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Unknown
Piping Type:	Not reported
Construction Material:	Unknown
Impressed Device:	No

P70 **BEA** **S105768045**
NNE **220 FELCH STREET** **N/A**
1/4-1/2 **ANN ARBOR TOWNSHIP, MI**
0.409 mi.
2160 ft. **Site 4 of 4 in cluster P**

Relative:
Lower

Actual:
790 ft.

BEA:

Secondary Address:	Not reported
BEA Number:	54
District:	Jackson
Date Received:	12/18/1996
Submitter Name:	Ann Arbor Art Association
Petition Determination:	No Request
Petition Disclosure:	0
Category:	No Hazardous Substance(s)
Determination 20107A:	No Request
Reviewer:	temppm
Division Assigned:	Storage Tank Division

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71 **FINGERLE LUMBER CO** **LUST** **U000266241**
SSE **202 E MADISON** **UST** **N/A**
1/4-1/2 **ANN ARBOR, MI 48104**
0.420 mi.
2219 ft.

Relative:
Higher

Actual:
819 ft.

LUST:

Facility ID:	00021201
Source:	STATE OF MICHIGAN
Owner Name:	Fingerle Lumber Co
Owner Address:	617 South 5th Avenue
Owner City,St,Zip:	Ann Arbor, MI 48104-2905
Owner Contact:	Not reported
Owner Phone:	(734) 663-5771

FINGERLE LUMBER CO (Continued) **U000266241**

Country:	USA
District:	Jackson District Office
Site Name:	Fingerle Lumber
Latitude:	42.27394
Longitude:	-83.74704
Date of Collection:	01/11/2001
Method of Collection:	Address Matching-House Number
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Data:	NAD83
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Leak Number:	C-2746-90
Release Date:	12/19/1990
Substance Released:	Not reported
Release Status:	Closed
Release Closed Date:	03/19/1997

UST:

Facility ID:	00021201
Facility Type:	ACTIVE
Latitude:	42.27394
Longitude:	-83.74704
Owner Name:	FINGERLE LUMBER CO
Owner Address:	617 SOUTH 5TH AVENUE
Owner City,St,Zip:	ANN ARBOR, MI 48104-2905
Owner Country:	USA
Owner Contact:	Not reported
Owner Phone:	(734) 663-5771
Contact:	Lawrence J Fingerle
Contact Phone:	(734) 663-5771
Date of Collection:	01/11/2001
Accuracy:	100
Accuracy Value Unit:	FEET
Horizontal Datum:	NAD83
Source:	STATE OF MICHIGAN
Point Line Area:	POINT
Desc Category:	Plant Entrance (Freight)
Method of Collection:	Address Matching-House Number
Tank ID:	1
Tank Status:	**Removed from Ground**
Capacity:	1000
Install Date:	03/18/1967
Product:	Diesel
Remove Date:	12/19/1990
Tank Release Detection:	Not reported
Pipe Realease Detection:	Not reported
Piping Material:	Galvanized Steel
Piping Type:	Not reported
Construction Material:	Asphalt Coated or Bare Steel
Impressed Device:	No
Tank ID:	2
Tank Status:	**Currently In Use**
Capacity:	3000

FINGERLE LUMBER CO (Continued) **U000266241**

Install Date:	12/21/1990
Product:	Diesel
Remove Date:	Not reported
Tank Release Detection:	Inventory Control, Interstitial Monitoring Double Walled Tank
Pipe Realease Detection:	Automatic Line Leak Detectors
Piping Material:	Fiberglass Reinforced Plastic
Piping Type:	Suction: Valve at Tank
Construction Material:	Cathodically Protected Steel, Double Walled
Impressed Device:	No

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72 **FINGERLE LUMBER CO** **AUL S109846094**
SSE **617 SOUTH FIFTH AVENUE** **N/A**
1/4-1/2 **ANN ARBOR CITY, MI 48104**
0.463 mi.
2444 ft.

Relative:
Higher

Actual:
824 ft.

AUL:

Status:	Recorded	
Site Name:	Not reported	
Property:	Fingerle Lumber Co	
Land Use Restriction Type:	RC	
Program Type:	Part 213	
Program Support Assigned User:	Nicholas Ekel	
Program Support Assigned Date:	1/6/2011 09:45:52.313	
Legal Description Of Property:	Migrated	
Based On The Deq Ref #:	11121304550	
MDEQ Reference Number:	RC-RRD-213-04-550	
Property Or Description Restricted Area:	Migrated	
Lead Division:	STD	
File Name Of Hyperlinked Legal Doc:	U:\\KERMIT\\11121304550.PDF	
Mapped Polygons Area In Acres:	1.2606999999999999	
Mapped Polygons Area In Square Miles:	0.0019	
Date Data Entry Started:	3/18/2011 00:00:00	
Date Data Entry Finished:	3/18/2011 00:00:00	
Individual Or Staff Assoc With The Mapping:		Nicholas Ekel
Program Used To Map Restricted Features:		ArcINFO 9.3 & IcoMAP 4.2
Map Comments:		20110106 - LRUR is NOT mapped in KERMIT - Nick Ekel 20110318 - LRUR is mapped in KERMIT - Nick Ekel
Comment:		Request received on 7/16/2004
Date Legal Paperwork Stamped/Filed/Register Of Deeds:		2/26/1997 00:00:00
Commercial I Land Use Restriction:	0	
Commercial Ii Land Use Restriction:	0	
Commercial Iii Land Use Restriction:	0	
Commercial Iv Land Use Restriction:	0	
Industrial Land Use Restriction:	0	
Residential Land Use Restriction:	0	
Recreational Land Use Restriction:	0	
Multiple Land-Use Restrictions:	0	
Site Specific Restrictions:	1	
Groundwater Consumption Restrictions:	1	
Groundwater Contact Restrictions:	0	
Special Well Construction Requirements:	0	
Special Building Restrictions:	0	
Excavation And Soil Movement Restrictions:		0
Soil Movement Requirements:		0
There Is A Restriction On All Construction:		0
Monitoring Well Protected, No Tampering Or Removal:		0
There Is An Exposure Barrier In Place:		0

FINGERLE LUMBER CO (Continued) **S109846094**

There Is A Health And Safety Plan: 0
There Is A Permanent Marker On The Site: 0

73
East
1/2-1
0.548 mi.
2892 ft.

H AND K CAMPUS PROPERTIES **SHWS** **S110126794**
212-216 SOUTH STATE STREET **N/A**
ANN ARBOR, MI 48104

Relative:
Higher

Actual:
874 ft.

SHWS:
Facility ID: 81000543
Facility Status: Evaluation conducted
Source: Not reported
SAM Score: 27
SAM Score Date: 05/25/2005
Township: 02S
Range: 06E
Section: 29
Quarter: Not reported
Quarter/Quarter: Not reported
Pollutants: Not reported

74
WSW
1/2-1
0.582 mi.
3072 ft.

MONTGOMERY PUMPING STATION **DEL SHWS** **U000266410**
432 MONTGOMERY **LUST** **N/A**
ANN ARBOR, MI 48107 **UST**
WDS

Relative:
Higher

Actual:
859 ft.

DELETED HWS:
Facility ID: 81000314
Status: Delisted - no longer meets criteria specified in rules

LUST:
Facility ID: 00010243
Source: STATE OF MICHIGAN
Owner Name: City of Ann Arbor
Owner Address: PO Box 8647 100 N Fifth Ave
Owner City,St,Zip: Ann Arbor, MI 48107
Owner Contact: Not reported
Owner Phone: (734) 794-6000
Country: USA
District: Jackson District Office
Site Name: Ann Arbor, Montgomery Pumping St
Latitude: 42.27864
Longitude: -83.76463
Date of Collection: 01/11/2001
Method of Collection: Address Matching-House Number
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Data: NAD83
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)

Leak Number: C-2234-91
Release Date: 10/11/1991
Substance Released: Unknown

MONTGOMERY PUMPING STATION (Continued) **U000266410**

Release Status: Closed
Release Closed Date: 08/20/1992

UST:
Facility ID: 00010243
Facility Type: CLOSED
Latitude: 42.27864
Longitude: -83.76463
Owner Name: CITY OF ANN ARBOR
Owner Address: PO BOX 8647 100 N FIFTH AVE
Owner City,St,Zip: ANN ARBOR, MI 48107
Owner Country: USA
Owner Contact: Not reported
Owner Phone: (734) 794-6000
Contact: DANIEL J. CULLEN
Contact Phone: (734) 994-6696
Date of Collection: 01/11/2001
Accuracy: 100
Accuracy Value Unit: FEET
Horizontal Datum: NAD83
Source: STATE OF MICHIGAN
Point Line Area: POINT
Desc Category: Plant Entrance (Freight)
Method of Collection: Address Matching-House Number

Tank ID: 1
Tank Status: Removed from Ground
Capacity: 5000
Install Date: 03/17/1966
Product: Diesel
Remove Date: 09/15/1991
Tank Release Detection: Not reported
Pipe Realease Detection: Not reported
Piping Material: Bare Steel
Piping Type: Not reported
Construction Material: Asphalt Coated or Bare Steel
Impressed Device: No

WDS:
Site Id: MIG000029069
WMD Id: 448371
Site Specific Name: CITY OF ANN ARBOR
Mailing Address: 432 MONTGOMERY AVE
Mailing City/State/Zip: 48103
Mailing County: WASHTENAW

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75 **SHWS S105768029**
NNE **815 WILDT ST** **BEA N/A**
1/2-1 **ANN ARBOR CITY, MI 48103** **WDS**
0.602 mi.
3176 ft.

Relative:
Lower

Actual:
804 ft.

SHWS:
Facility ID: 81000560
Facility Status: Evaluation conducted
Source: Not reported
SAM Score: 29
SAM Score Date: 06/02/2005

(Continued) **S105768029**

Township: 02S
Range: 06E
Section: 20
Quarter: Not reported
Quarter/Quarter: Not reported
Pollutants: Not reported

BEA:
Secondary Address: Ann Arbor, MI
BEA Number: 295
District: Jackson
Date Received: 06/07/2001
Submitter Name: Wildt LLC
Petition Determination: Affirmed
Petition Disclosure: 1
Category: No Hazardous Substance(s)
Determination 20107A: No Request
Reviewer: lipinskl
Division Assigned: Environmental Response Division

WDS:
Site Id: MIG000004678
WMD Id: 458532
Site Specific Name: ANN ARBOR BEARING & MFG CO
Mailing Address: 815 WILDT ST
Mailing City/State/Zip: 48103
Mailing County: WASHTENAW

76
NNE
1/2-1
0.661 mi.
3491 ft.

Relative:
Lower

Actual:
782 ft.

SHEFFIELD PHARMACEUTICALS **SHWS S103086312**
912 N MAIN ST **WDS N/A**
ANN ARBOR, MI 48104

SHWS:
Facility ID: 81000094
Facility Status: Interim Response in progress
Source: Not reported
SAM Score: 28
SAM Score Date: 06/18/2004
Township: 02S
Range: 06E
Section: 20
Quarter: SE
Quarter/Quarter: SE
Pollutants: Benzene; Ethylbenzene; Toluene; Xylenes

WDS:
Site Id: MIG000043698
WMD Id: 426688
Site Specific Name: SHEFFIELD PHARMACEUTICALS
Mailing Address: 912 N MAIN ST
Mailing City/State/Zip: 48104
Mailing County: WASHTENAW

77
NE
1/2-1
0.666 mi.
3517 ft.

CITY GAS WORKS
BEAKES STREET
ANN ARBOR, MI 48104

EDR MGP **1008408080**
N/A

Relative:
Lower

Actual:
783 ft.

Manufactured Gas Plants:
Alternate Name:ANN ARBOR GAS CO. No additional information available

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78
NE
1/2-1
0.783 mi.
4136 ft.

MICH. CON BROADWAY SITE
841 BROADWAY
ANN ARBOR, MI

SHWS **S108417361**
BROWNFIELDS **N/A**
WDS

Relative:
Lower

Actual:
761 ft.

SHWS:
Facility ID: 81000025
Facility Status: Interim Response in progress
Source: Petroleum & Coal Products
SAM Score: 44
SAM Score Date: 07/14/2004
Township: 02S
Range: 06E
Section: 20
Quarter: SW
Quarter/Quarter: SE
Pollutants: As; CN; Pb; Ni; Zn; Phthalates

BROWNFIELD:
Facility ID: Not reported
Region: 1
Status: Not reported
Properry Use: Not reported
Use at Time of Listing: Not reported
BEA: No
Ernie Id Number: 81000025

WDS:
Site Id: MIR000019620
WMD Id: 411146
Site Specific Name: DTE ENERGY/MICHCON BROADWAY STATION
Mailing Address: 1 ENERGY PLZ
Mailing City/State/Zip: 48226
Mailing County: WAYNE

Site Id: MIG000043564
WMD Id: 441690
Site Specific Name: WASHTENAW COUNTY DRAIN COMM
Mailing Address: 841 BROADWAY ST
Mailing City/State/Zip: 48105
Mailing County: WASHTENAW

79
NE
1/2-1
0.852 mi.
4499 ft.

THE ANN ARBOR GAS CO
BROADWAY STREET
ANN ARBOR, MI 48104

EDR MGP **1008408081**
N/A

Relative:
Lower

Actual:
781 ft.

Manufactured Gas Plants:

Alternate Name:THE WASHTENAW GAS CO. The former MGP at this site produced gas utilizing both the coal carbonization and carburetted water gas methods and operated from approximately 1899 to the early 1940s

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80
NNE
1/2-1
0.873 mi.
4608 ft.

ANN ARBOR ART TRAIN
1100 N MAIN ST
ANN ARBOR, MI 48104

SHWS **S105144767**
WDS **N/A**

Relative:
Lower

Actual:
794 ft.

SHWS:

Facility ID:	81000093
Facility Status:	**Interim Response in progress**
Source:	Not reported
SAM Score:	24
SAM Score Date:	06/18/2004
Township:	02S
Range:	06E
Section:	20
Quarter:	SE
Quarter/Quarter:	NW
Pollutants:	PCB's; Diesel fuel; Metals; PNAs

WDS:

Site Id:	MIG000041541
WMD Id:	420748
Site Specific Name:	ANN ARBOR ART TRAIN
Mailing Address:	1100 N MAIN ST
Mailing City/State/Zip:	48104
Mailing County:	WASHTENAW

Site Id:	MIG000022118
WMD Id:	452117
Site Specific Name:	MCKINLEY FOUNDATION
Mailing Address:	1100 N MAIN ST
Mailing City/State/Zip:	48104
Mailing County:	WASHTENAW

Count: 27 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
ANN ARBOR	U000266166	SHELL STATION	1251ST N MAPLE & MILLER		LUST, UST
ANN ARBOR	U000266169	MARATHON UNIT #1793	1300TH N MAPLE & MILLER		LUST, UST
ANN ARBOR	S109847381	PARCELS B & C	1600TH HURON PKWY & 3200 PLYM	48105	BEA
ANN ARBOR	S110126793	HIDEAWAY LANE	2000TH & 2018 TRAVER RD	48104	SHWS
ANN ARBOR	S107812200		2235TH & S STATE	48104	BEA
ANN ARBOR	S112241521	UNKNOWN	2565TH & S 2601ST STATE ST	48104	BEA
ANN ARBOR	S107812208		401ST & E WASHINGTON	48104	BEA
ANN ARBOR	S112241405		391 AND 401 MILLER RD	48104	BEA
ANN ARBOR	1007102345	MI DEPT/NATURAL RESOURCES AND ENVI	E BANK OF ARGO POND IN HURON R	48103	RCRA NonGen / NLR
ANN ARBOR	S103086285	MICH CON BEAKES ST	BEAKES & SUMMIT STS	48104	SHWS
ANN ARBOR	1015731350	M14 ROLLOVER	S BOUND RAMP	48103	CERCLIS
ANN ARBOR	S107031683	EATON CORP - ANN ARBOR	SW COR OF FIRST S & W LIBERTY	48103	BEA
ANN ARBOR	S103595056	UNIV OF MICH HOSPITAL FULLER RD	FULLER RD	48103	SHWS
ANN ARBOR	S103095426	UM NORTH CAMPUS LANDFILL AREA	HURON PKWY	48104	SHWS
ANN ARBOR	U000266453	ST JOSEPH MERCY HEALTH SYSTEM	5301 E HURON RIVER DR	48105	LUST, UST
ANN ARBOR	1011862613	COUNTY OF WASHTENAW ROAD COMMISSI	LIBERTY ROAD NEAR HONEY RUN	48103	RCRA NonGen / NLR
ANN ARBOR	U004182007	LIBERTY STREET	221 W LIBERTY	48103	UST
ANN ARBOR	S110532133	MADISON & MAIN STREETS	MADISON & MAIN STS		BROWNFIELDS
ANN ARBOR	S110482796		626 N MAIN	48103	BEA
ANN ARBOR	U003758877	ANN ARBOR PIPE & SUPPLY	20295 STATE		LUST, UST
ANN ARBOR	S103595047	AVFUEL BULK FACILITY	STATE AND ELLSWORTH RDS	48104	SHWS
ANN ARBOR	S109845799	BRIARWOOD SERVICE CENTER-AMOCO	3230 S STATE ST	48104	AUL
ANN ARBOR	2008434861	401 WEST TOUHY AVENUE	401 WEST TOUHY AVENUE		HMIRS
ANN ARBOR	1001202468	MI DEPT/TRANSPORTATION	USHY 23 UNDERANNARBORPLYMOUTH	48105	RCRA NonGen / NLR, FINDS
ANN ARBOR	1003871798	UNIVERSITY OF MICHIGAN LANDFILL #1	WASHINGTON HTS	48104	CERC-NFRAP
ANN ARBOR	S103595057	UNIVERSITY OF MICH LF NO 1	WASHINGTON HTS	48104	SHWS
MUSKEGON	96516828	WEST MICHIGAN MART DOCK MUSKEGON L	W MICHIGAN MART DOCK MUSKEGON	48105	ERNS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 70

Source: EPA
Telephone: N/A
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 70

Source: EPA
Telephone: N/A
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 70

Source: EPA
Telephone: N/A
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 11/02/2012
Date Data Arrived at EDR: 11/28/2012
Date Made Active in Reports: 01/07/2013
Number of Days to Update: 40

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 10/09/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 72

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/11/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 11/02/2012
Date Data Arrived at EDR: 11/28/2012
Date Made Active in Reports: 01/07/2013
Number of Days to Update: 40

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 08/19/2011
Date Data Arrived at EDR: 08/31/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 132

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 07/18/2012
Date Data Arrived at EDR: 07/24/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 104

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 07/18/2012
Date Data Arrived at EDR: 07/24/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 104

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/15/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 04/02/2012
Date Data Arrived at EDR: 04/03/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 72

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 01/11/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

State- and tribal - equivalent CERCLIS

SHWS: Contaminated Sites

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 10/31/2012
Date Data Arrived at EDR: 11/01/2012
Date Made Active in Reports: 11/28/2012
Number of Days to Update: 27

Source: Department of Natural Resources & Environment
Telephone: 517-373-9541
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Semi-Annually

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Solid Waste Facilities Database

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 01/03/2013
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 01/14/2013
Number of Days to Update: 11

Source: Department of Natural Resources & Environment
Telephone: 517-335-4035
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Semi-Annually

WDS: Waste Data System

The Waste Data System (WDS) tracks activities at facilities regulated by the Solid Waste, Scrap Tire, Hazardous Waste, and Liquid Industrial Waste programs.

Date of Government Version: 06/20/2012
Date Data Arrived at EDR: 06/20/2012
Date Made Active in Reports: 08/06/2012
Number of Days to Update: 47

Source: Department oF Natural Resources & Environment
Telephone: 517-373-9875
Last EDR Contact: 01/07/2013
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Sites

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 11/05/2012
Date Data Arrived at EDR: 11/19/2012
Date Made Active in Reports: 01/14/2013
Number of Days to Update: 56

Source: Department of Natural Resources & Environment
Telephone: 517-373-9837
Last EDR Contact: 11/19/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Annually

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 08/01/2012
Date Data Arrived at EDR: 08/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 75

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/30/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 08/17/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 09/06/2012
Date Data Arrived at EDR: 09/07/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/12/2012
Date Data Arrived at EDR: 05/09/2012
Date Made Active in Reports: 07/10/2012
Number of Days to Update: 62

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 12/14/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 26

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Semi-Annually

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 59

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

State and tribal registered storage tank lists

UST: Underground Storage Tank Facility List
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 11/05/2012
Date Data Arrived at EDR: 11/19/2012
Date Made Active in Reports: 01/14/2013
Number of Days to Update: 56

Source: Department of Natural Resources & Environment
Telephone: 517-335-4035
Last EDR Contact: 11/19/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Annually

UST 2: Underground Storage Tank Listing
A listing of underground storage tank site locations that have unknown owner information.

Date of Government Version: 11/19/2012
Date Data Arrived at EDR: 11/26/2012
Date Made Active in Reports: 01/14/2013
Number of Days to Update: 49

Source: Department of Environmental Quality
Telephone: 517-335-7211
Last EDR Contact: 11/16/2012
Next Scheduled EDR Contact: 02/04/2013
Data Release Frequency: Annually

AST: Aboveground Tanks
Registered Aboveground Storage Tanks.

Date of Government Version: 03/09/2012
Date Data Arrived at EDR: 03/21/2012
Date Made Active in Reports: 04/27/2012
Number of Days to Update: 37

Source: Department of Natural Resources & Environment
Telephone: 517-373-8168
Last EDR Contact: 11/16/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: No Update Planned

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/12/2012
Date Data Arrived at EDR: 05/02/2012
Date Made Active in Reports: 07/16/2012
Number of Days to Update: 75

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 12/14/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 26

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 08/02/2012
Date Data Arrived at EDR: 08/03/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 94

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 34

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 08/17/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 08/01/2012
Date Data Arrived at EDR: 08/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 75

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 09/06/2012
Date Data Arrived at EDR: 09/07/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 39

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/14/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

AUL: Engineering and Institutional Controls

A listing of sites with institutional and/or engineering controls in place.

Date of Government Version: 03/28/2012
Date Data Arrived at EDR: 03/28/2012
Date Made Active in Reports: 04/20/2012
Number of Days to Update: 23

Source: Department of Natural Resources & Environment
Telephone: 517-373-4828
Last EDR Contact: 12/03/2012
Next Scheduled EDR Contact: 03/18/2013
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/28/2012
Date Data Arrived at EDR: 10/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 14

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Brownfields and USTfield Site Database

All state funded Part 201 and 213 sites, as well as LUST sites that have been redeveloped by private entities using the BEA process. Be aware that this is not a list of all of the potential brownfield sites in Michigan.

Date of Government Version: 07/27/2012
Date Data Arrived at EDR: 07/31/2012
Date Made Active in Reports: 09/20/2012
Number of Days to Update: 51

Source: Department of Natural Resources & Environment
Telephone: 517-373-4805
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 11/12/2012
Data Release Frequency: Varies

BROWNFIELDS 2: Brownfields Building and Land Site Locations

A listing of brownfield building and land site locations. The listing is a collaborative effort of Michigan Economic Development Corporation, Michigan Economic Developers Association, Detrot Edison, Detroit Area Commercial Board of Realtors

Date of Government Version: 04/09/2007
Date Data Arrived at EDR: 04/10/2007
Date Made Active in Reports: 05/01/2007
Number of Days to Update: 21

Source: Economic Development Corporation
Telephone: 888-522-0103
Last EDR Contact: 12/03/2012
Next Scheduled EDR Contact: 03/18/2013
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/10/2012
Date Data Arrived at EDR: 12/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 9

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/03/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWRCY: Recycling Facilities
A listing of recycling center locations.

Date of Government Version: 11/24/2009
Date Data Arrived at EDR: 09/30/2010
Date Made Active in Reports: 10/28/2010
Number of Days to Update: 28
Source: Department of Natural Resources & Environment
Telephone: 517-241-5719
Last EDR Contact: 01/04/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

HIST LF: Inactive Solid Waste Facilities
The database contains historical information and is no longer updated.

Date of Government Version: 03/01/1997
Date Data Arrived at EDR: 02/28/2003
Date Made Active in Reports: 03/06/2003
Number of Days to Update: 6
Source: Department of Natural Resources & Environment
Telephone: 517-335-4034
Last EDR Contact: 02/28/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 11/05/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 07/11/2012
Date Data Arrived at EDR: 09/12/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 54
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 12/03/2012
Next Scheduled EDR Contact: 03/18/2013
Data Release Frequency: Quarterly

DEL SHWS: Delisted List of Contaminated Sites
Sites that have been delisted or deleted from the List of Contaminated Sites. The available documentation for the site does not support it's listing or the site no longer meets criteria specified in rules.

Date of Government Version: 11/08/2012
Date Data Arrived at EDR: 11/08/2012
Date Made Active in Reports: 11/28/2012
Number of Days to Update: 20
Source: Department of Natural Resources & Environment
Telephone: 517-373-9541
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

CDL: Clandestine Drug Lab Listing
A listing of clandestine drug lab locations.

Date of Government Version: 10/20/2008
Date Data Arrived at EDR: 11/18/2008
Date Made Active in Reports: 11/21/2008
Number of Days to Update: 3

Source: Department of Community Health
Telephone: 517-373-3740
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/16/2012
Date Data Arrived at EDR: 03/26/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

LIENS: Lien List
An Environmental Lien is a charge, security, or encumbrance upon title to a property to secure the payment of a cost, damage, debt, obligation, or duty arising out of response actions, cleanup, or other remediation of hazardous substances or petroleum products upon a property, including (but not limited to) liens imposed pursuant to CERCLA 42 USC * 9607(1) and similar state or local laws. In other words: a lien placed upon a property's title due to an environmental condition

Date of Government Version: 10/02/2012
Date Data Arrived at EDR: 10/24/2012
Date Made Active in Reports: 11/28/2012
Number of Days to Update: 35

Source: Department of Natural Resources & Environment
Telephone: 517-373-9837
Last EDR Contact: 10/22/2012
Next Scheduled EDR Contact: 02/04/2013
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 04/01/2012
Date Data Arrived at EDR: 04/03/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 72

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

PEAS: Pollution Emergency Alerting System

Environmental pollution emergencies reported to the Department of Environmental Quality such as tanker accidents, pipeline breaks, and release of reportable quantities of hazardous substances.

Date of Government Version: 08/31/2012
Date Data Arrived at EDR: 09/27/2012
Date Made Active in Reports: 11/20/2012
Number of Days to Update: 54

Source: Department of Natural Resources & Environment
Telephone: 517-373-8427
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Quarterly

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 11/06/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/18/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 08/12/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 112

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/19/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 62

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 02/27/2012
Date Data Arrived at EDR: 03/14/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 92

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 11/28/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/18/2011
Date Data Arrived at EDR: 09/08/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 21

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 12/05/2012
Next Scheduled EDR Contact: 03/18/2013
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 09/01/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 131

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 11/28/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems
Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77
Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61
Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 10/19/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/01/2010
Date Data Arrived at EDR: 11/10/2010
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 98

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/19/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/21/2011
Date Data Arrived at EDR: 07/15/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 60

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 10/02/2012
Date Data Arrived at EDR: 10/02/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/09/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 10/23/2011
Date Data Arrived at EDR: 12/13/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 79

Source: EPA
Telephone: (312) 353-2000
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 05/08/2012
Date Data Arrived at EDR: 05/25/2012
Date Made Active in Reports: 07/10/2012
Number of Days to Update: 46

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 11/30/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Biennially

UIC: Underground Injection Wells Database

A listing of underground injection well locations. The UIC Program is responsible for regulating the construction, operation, permitting, and closure of injection wells that place fluids underground for storage or disposal.

Date of Government Version: 11/01/2012
Date Data Arrived at EDR: 11/01/2012
Date Made Active in Reports: 11/28/2012
Number of Days to Update: 27

Source: Department of Natural Resources & Environment
Telephone: 517-241-1515
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

DRYCLEANERS: Drycleaning Establishments

A listing of drycleaning facilities in Michigan.

Date of Government Version: 10/22/2012
Date Data Arrived at EDR: 10/24/2012
Date Made Active in Reports: 11/28/2012
Number of Days to Update: 35

Source: Department of Natural Resources & Environment
Telephone: 517-335-4586
Last EDR Contact: 10/22/2012
Next Scheduled EDR Contact: 02/04/2013
Data Release Frequency: Annually

NPDES: List of Active NPDES Permits

General information regarding NPDES (National Pollutant Discharge Elimination System) permits and NPDES Storm Water permits.

Date of Government Version: 10/09/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 10/30/2012
Number of Days to Update: 19

Source: Department of Natural Resources & Environment
Telephone: 517-241-1300
Last EDR Contact: 01/09/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Varies

AIRS: Permit and Emissions Inventory Data

Permit and emissions inventory data.

Date of Government Version: 09/27/2012
Date Data Arrived at EDR: 09/28/2012
Date Made Active in Reports: 10/30/2012
Number of Days to Update: 32

Source: Department of Natural Resources & Environment
Telephone: 517-373-7074
Last EDR Contact: 12/18/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Varies

BEA: BASELINE ENVIRONMENTAL ASSESSMENT DATABASE

A Baseline Environmental Assessment (BEA) allows people to purchase or begin operating at a facility without being held liable for existing contamination. BEAs are used to gather enough information about the property being transferred so that existing contamination can be distinguished from any new releases that might occur after the new owner or operator takes over the property.

Date of Government Version: 11/26/2012
Date Data Arrived at EDR: 11/26/2012
Date Made Active in Reports: 01/14/2013
Number of Days to Update: 49

Source: Department of Natural Resources & Environment
Telephone: 517-373-9541
Last EDR Contact: 11/16/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Semi-Annually

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/18/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 10/22/2012
Next Scheduled EDR Contact: 02/04/2013
Data Release Frequency: Varies

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 01/18/2012
Date Data Arrived at EDR: 01/27/2012
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 34

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/13/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 36

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 08/20/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 11/16/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Quarterly

PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 11/02/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

COAL ASH: Coal Ash Disposal Sites

Coal fired power plants in Southeast Michigan that have coal ash handling on site.

Date of Government Version: 04/21/2011
Date Data Arrived at EDR: 04/21/2011
Date Made Active in Reports: 05/13/2011
Number of Days to Update: 22

Source: Department of Natural Resources & Environment
Telephone: 586-753-3754
Last EDR Contact: 01/07/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 10/16/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial assurance information.

Date of Government Version: 01/17/2012
Date Data Arrived at EDR: 01/18/2012
Date Made Active in Reports: 02/10/2012
Number of Days to Update: 23

Source: Department of Natural Resources & Environment
Telephone: 517-335-6610
Last EDR Contact: 01/07/2013
Next Scheduled EDR Contact: 04/22/2013
Data Release Frequency: Varies

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 01/18/2012
Date Data Arrived at EDR: 01/27/2012
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 34

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011
Date Data Arrived at EDR: 05/18/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 08/16/2012
Next Scheduled EDR Contact: 11/26/2012
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 01/05/2011
Date Data Arrived at EDR: 01/07/2011
Date Made Active in Reports: 02/14/2011
Number of Days to Update: 38

Source: Department of Natural Resources & Environment
Telephone: 517-335-4034
Last EDR Contact: 01/02/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 32

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Quarterly

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/18/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: N/A

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 11/19/2012
Date Data Arrived at EDR: 11/19/2012
Date Made Active in Reports: 01/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/19/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 08/28/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 10/16/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 11/01/2012
Date Data Arrived at EDR: 11/07/2012
Date Made Active in Reports: 12/11/2012
Number of Days to Update: 34

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 11/07/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/23/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 57

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/22/2012
Next Scheduled EDR Contact: 02/04/2013
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 06/22/2012
Date Made Active in Reports: 07/31/2012
Number of Days to Update: 39

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 09/27/2012
Number of Days to Update: 70

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/13/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Day Care Centers, Group & Family Homes
Source: Bureau of REgulatory Services
Telephone: 517-373-8300

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory
Source: Department of Natural Resources
Telephone: 517-241-2254

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

415 WEST WASHINGTON
415 W. WASHINGTON
ANN ARBOR, MI 48103

TARGET PROPERTY COORDINATES

Latitude (North):	42.2806 - 42° 16' 50.16''
Longitude (West):	83.7521 - 83° 45' 7.56''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	273067.0
UTM Y (Meters):	4684386.0
Elevation:	809 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	42083-C7 ANN ARBOR WEST, MI
Most Recent Revision:	1983
East Map:	42083-C6 ANN ARBOR EAST, MI
Most Recent Revision:	1983

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

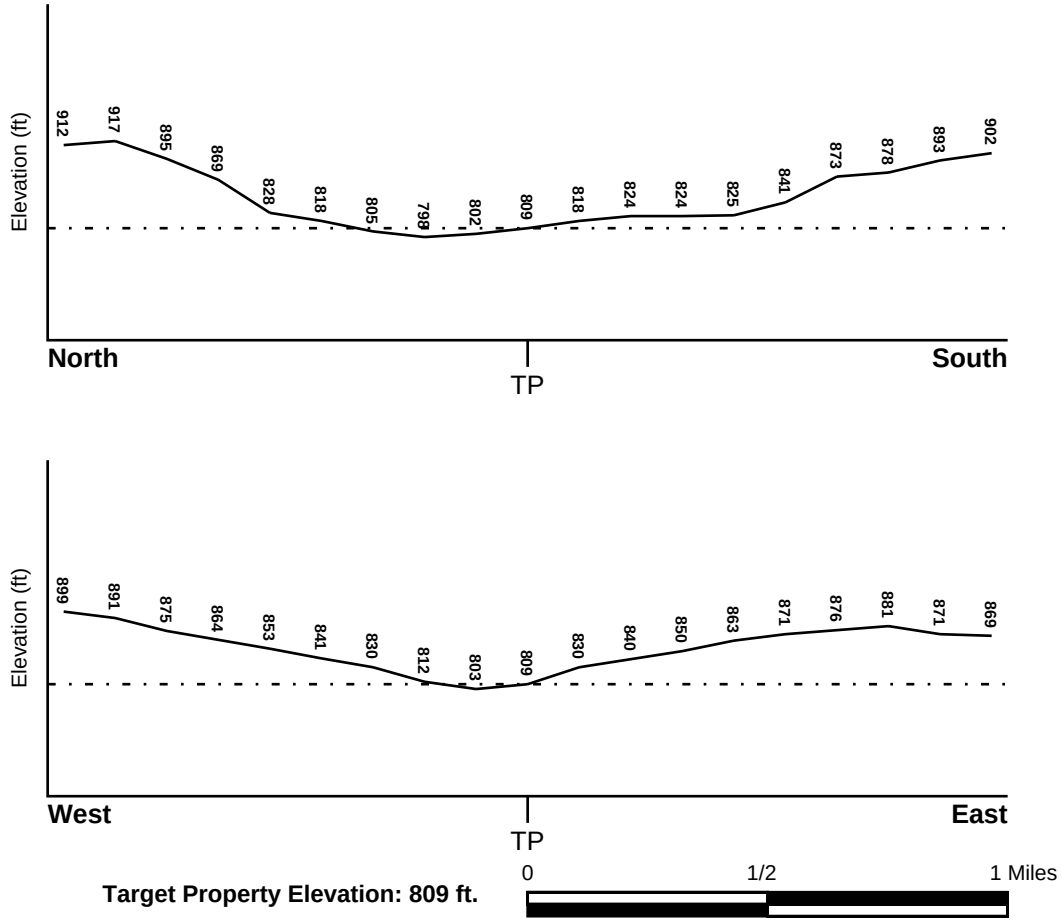
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
WASHTENAW, MI	Not Available

Flood Plain Panel at Target Property: Not Reported

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
ANN ARBOR WEST	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
A1	0 - 1/8 Mile NNE	NNW
A2	0 - 1/8 Mile NNE	N
3	1/4 - 1/2 Mile SE	ENE
7	1/2 - 1 Mile NE	ENE
9	1/2 - 1 Mile NNE	Not Reported
10	1/2 - 1 Mile SE	NNW

For additional site information, refer to Physical Setting Source Map Findings.

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Paleozoic
System:	Mississippian
Series:	Osagean and Kinderhookian Series
Code:	M1 *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	BOYER
Soil Surface Texture:	sandy loam
Hydrologic Group:	Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.
Soil Drainage Class:	Well drained. Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: LOW

Depth to Bedrock Min: > 60 inches

Depth to Bedrock Max: > 60 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	7 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 6.00 Min: 2.00	Max: 7.30 Min: 5.60
2	7 inches	18 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 6.00 Min: 2.00	Max: 7.30 Min: 5.60
3	18 inches	34 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 6.00 Min: 2.00	Max: 7.80 Min: 5.60
4	34 inches	60 inches	gravelly - sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 20.00 Min: 20.00	Max: 8.40 Min: 7.40

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: loamy sand
muck
loam

Surficial Soil Types: loamy sand
muck
loam

Shallow Soil Types: silty clay loam
sandy loam
clay loam

Deeper Soil Types: sand
sand and gravel
stratified
clay loam
loam

coarse sand
muck

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

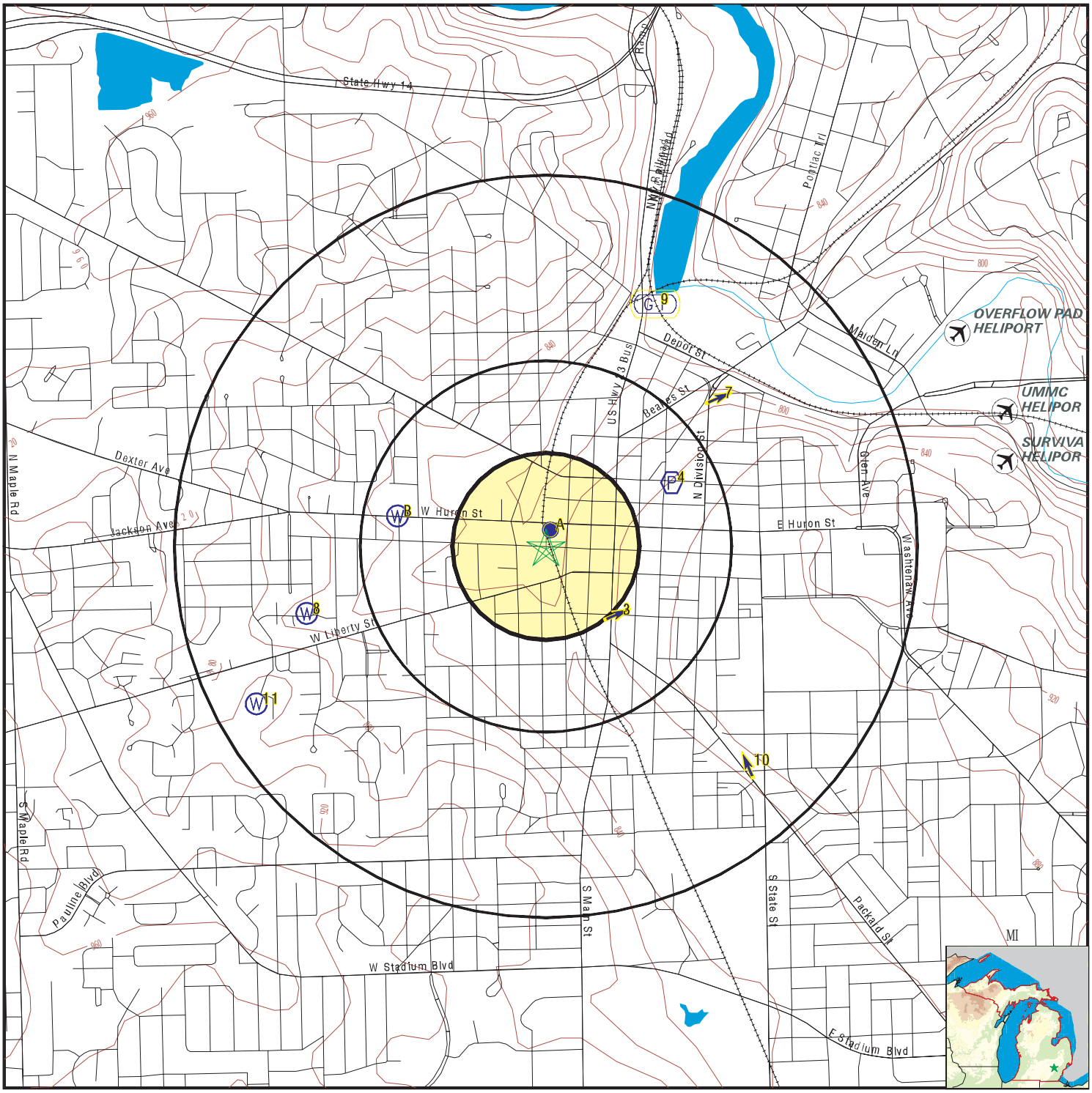
MAP ID	WELL ID	LOCATION FROM TP
4	MI0003940	1/4 - 1/2 Mile ENE

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
B5	MI3000000052297	1/4 - 1/2 Mile WNW
B6	MI3000000052296	1/4 - 1/2 Mile WNW
8	MI3000000051895	1/2 - 1 Mile WSW
11	MI3000000051505	1/2 - 1 Mile WSW

PHYSICAL SETTING SOURCE MAP - 3493977.2s



0 1/4 1/2 1 Miles

- County Boundary
- Major Roads
- Contour Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

N

SITE NAME: 415 West Washington	CLIENT: Tetra Tech GEO
ADDRESS: 415 W. Washington Ann Arbor MI 48103	CONTACT: Joy Gryzenia
LAT/LONG: 42.2806 / 83.7521	INQUIRY #: 3493977.2s DATE: January 14, 2013 12:26 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

			Database	EDR ID Number
A1 **NNE** **0 - 1/8 Mile** **Higher**	Site ID: Groundwater Flow: Shallowest Water Table Depth: Deepest Water Table Depth: Average Water Table Depth: Date:	810148 NNW Not Reported Not Reported 6 04/23/1996	**AQUIFLOW**	**45873**
A2 **NNE** **0 - 1/8 Mile** **Lower**	Site ID: Groundwater Flow: Shallowest Water Table Depth: Deepest Water Table Depth: Average Water Table Depth: Date:	810075 N 6.16 6.90 Not Reported 04/1990	**AQUIFLOW**	**63226**
3 **SE** **1/4 - 1/2 Mile** **Higher**	Site ID: Groundwater Flow: Shallowest Water Table Depth: Deepest Water Table Depth: Average Water Table Depth: Date:	810318 ENE 20 112 Not Reported 12/1991	**AQUIFLOW**	**39436**

4
ENE
1/4 - 1/2 Mile
Higher

FRDS PWS **MI0003940**

Pwsid:	MI0003940	Epa region:	05
State:	MI	County:	Washtenaw
Pws name:	LOCH ALPINE SANITARY AUTHORITY		
Population Served:	1590	Pwssvcconn:	530
PWS Source:	Groundwater		
Pws type:	CWS		
Status:	Active	Owner type:	Local_Govt
Facility id:	2182		
Facility name:	WELL 1		
Facility type:	Well	Treatment process:	filtration, pressure sand
Treatment objective:	iron removal		
Contact name:	GEYER, DAN		
Original name:	GEYER, DAN		
Contact phone:	734-426-4545	Contact address1:	4530 West Huron River Drive
Contact address2:	Not Reported		
Contact city:	ANN ARBOR		
Contact zip:	48103		
Facility id:	2183		
Facility name:	WELL 2		
Facility type:	Well	Treatment process:	filtration, pressure sand
Treatment objective:	iron removal		

Facility id:	3200		
Facility name:	WELL 3		
Facility type:	Well	Treatment process:	filtration, pressure sand
Treatment objective:	iron removal		
Facility id:	4102		
Facility name:	DISTRIBUTION SYSTEM		
Facility type:	Distribution_system_zone	Treatment process:	filtration, pressure sand
Treatment objective:	iron removal		
Facility id:	6843		
Facility name:	LOCH ALPINE DR WEST		
Facility type:	Storage	Treatment process:	filtration, pressure sand
Treatment objective:	iron removal		
Facility id:	8249		
Facility name:	IRON REMOVAL PLANT		
Facility type:	Treatment_plant	Treatment process:	filtration, pressure sand
Treatment objective:	iron removal		
Facility id:	2182		
Facility name:	WELL 1		
Facility type:	Well	Treatment process:	hypochlorination, pre
Treatment objective:	disinfection		
Facility id:	2183		
Facility name:	WELL 2		
Facility type:	Well	Treatment process:	hypochlorination, pre
Treatment objective:	disinfection		
Facility id:	3200		
Facility name:	WELL 3		
Facility type:	Well	Treatment process:	hypochlorination, pre
Treatment objective:	disinfection		
Facility id:	4102		
Facility name:	DISTRIBUTION SYSTEM		
Facility type:	Distribution_system_zone	Treatment process:	hypochlorination, pre
Treatment objective:	disinfection		
Facility id:	6843		
Facility name:	LOCH ALPINE DR WEST		
Facility type:	Storage	Treatment process:	hypochlorination, pre
Treatment objective:	disinfection		
Facility id:	8249		
Facility name:	IRON REMOVAL PLANT		
Facility type:	Treatment_plant	Treatment process:	hypochlorination, pre
Treatment objective:	disinfection		
Facility id:	2182		
Facility name:	WELL 1		
Facility type:	Well	Treatment process:	filtration, greensand
Treatment objective:	manganese removal		

Facility id: 2183
Facility name: WELL 2
Facility type: Well Treatment process: filtration, greensand
Treatment objective: manganese removal

Facility id: 3200
Facility name: WELL 3
Facility type: Well Treatment process: filtration, greensand
Treatment objective: manganese removal

Facility id: 4102
Facility name: DISTRIBUTION SYSTEM
Facility type: Distribution_system_zone Treatment process: filtration, greensand
Treatment objective: manganese removal

Facility id: 6843
Facility name: LOCH ALPINE DR WEST
Facility type: Storage Treatment process: filtration, greensand
Treatment objective: manganese removal

Facility id: 8249
Facility name: IRON REMOVAL PLANT
Facility type: Treatment_plant Treatment process: filtration, greensand
Treatment objective: manganese removal

PWS ID: MI0003940
Date Initiated: Not Reported Date Deactivated: Not Reported
PWS Name: LOCH ALPINE SANITARY AUTHORITY
LOCH ALPINE SANITARY AUTHORITY
4530 WEST HURON RIVER DRIVE
ANN ARBOR, MI 48103

Addressee / Facility: Not Reported

Facility Latitude: 42 16 59 Facility Longitude: 083 44 44
City Served: Not Reported
Treatment Class: Treated Population: 1233

Violations information not reported.

ENFORCEMENT INFORMATION:

System Name: LOCH ALPINE SANITARY AUTHO
Violation Type: Monitoring, Routine Major (TCR)
Contaminant: COLIFORM (TCR)
Compliance Period: 1994-07-01 - 1994-07-31
Violation ID: 9440001
Enforcement Date: 1994-08-10 Enf. Action: State Violation/Reminder Notice

System Name: LOCH ALPINE SANITARY AUTHO
Violation Type: Monitoring, Routine Major (TCR)
Contaminant: COLIFORM (TCR)
Compliance Period: 1994-07-01 - 1994-07-31
Violation ID: 9440001
Enforcement Date: 1994-08-10 Enf. Action: State Public Notif Requested

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
B5 **WNW** **1/4 - 1/2 Mile** **Higher**	**MI WELLS**	**MI3000000052297**

Wellid:	81000010161	Import id:	Not Reported
County:	Washtenaw	Township:	Scio
Town range:	02S 05E	Section:	3
Owner name:	COMM. DEV. GROUP OF ANN ARBOR		
Well addr:	1000 HURON RIVER		
Well depth:	184		
Well type:	Household		
Wssn:	0		
Well num:	Not Reported	Driller id:	524
Const date:	2000-02-16 14:17:27.000	Case type:	PVC Plastic
Case dia:	5		
Case depth:	179		
Screen frm:	179		
Screen to:	184		
Swl:	106		
Test depth:	107		
Test hours:	2		
Test rate:	12	Test methd:	Unknown
Grouted:	1	Pmp cpcity:	0
Latitude:	42.28178523		
Longitude:	-83.7598847		
Methd coll:	Address Matching-House Number		
Elevation:	837		
Elev methd:	Topographoc Map Interpolation	Depth flag:	Not Reported
Elev flag:	Not Reported		
Swl flag:	Not Reported		
Elev dem:	833	Elev dif:	4
Elev miv:	837	Aq code:	Drift Well
Aq flag:	Not Reported		
Pct aq:	37		
Pct aq d:	37	Pct aq r:	0
Pct maq:	0	Pct maq d:	0
Pct maq r:	0	Pct cm:	59
Pct cm d:	59	Pct cm r:	0
Pct pcm:	4	Pct pcm d:	4
Pct pcm r:	0	Pct na:	0
Pct na d:	0	Pct na r:	0
Pct flag:	Not Reported	Rock top:	-1
D r type:	Not Reported	Spc cpcity:	0
A thicknes:	7	A pct aq:	0
A pct maq:	0	A pct pcm:	100
A pct cm:	0	A pct na:	0
A thickns2:	78	A pct aq2:	3
A pct maq2:	0	A pct pcm2:	9
A pct cm2:	88	A pct na2:	0
A hit swl:	F	A hit top:	F
A hit rock:	F	A sc lith1:	Clay Sand Gravel
A sc lmod1:	Not Reported	A sc lmaq1:	PCM
A sc lpct1:	100	A sc lith2:	Not Reported
A sc lmod2:	Not Reported	A sc lmaq2:	Not Reported
A sc lpct2:	0	Pct aq 1:	0
Pct maq 1:	0	Pct cm 1:	100
Pct pcm 1:	0	Pct na 1:	0

Pct aq 2:	0	Pct maq 2:	0
Pct cm 2:	100	Pct pcm 2:	0
Pct na 2:	0	Pct aq 3:	100
Pct maq 3:	0	Pct cm 3:	0
Pct pcm 3:	0	Pct na 3:	0
Pct aq 4:	100	Pct maq 4:	0
Pct cm 4:	0	Pct pcm 4:	0
Pct na 4:	0	Pct aq 5:	100
Pct maq 5:	0	Pct cm 5:	0
Pct pcm 5:	0	Pct na 5:	0
Pct aq 6:	32	Pct maq 6:	0
Pct cm 6:	68	Pct pcm 6:	0
Pct na 6:	0	Pct aq 7:	0
Pct maq 7:	0	Pct cm 7:	100
Pct pcm 7:	0	Pct na 7:	0
Pct aq 8:	0	Pct maq 8:	0
Pct cm 8:	0	Pct pcm 8:	0
Pct na 8:	0	Pct aq 9:	0
Pct maq 9:	0	Pct cm 9:	0
Pct pcm 9:	0	Pct na 9:	0
Pct aq 10:	0	Pct maq 10:	0
Pct cm 10:	0	Pct pcm 10:	0
Pct na 10:	0	Pct aq 11:	0
Pct maq 11:	0	Pct cm 11:	0
Pct pcm 11:	0	Pct na 11:	0
Pct aq 12:	0	Pct maq 12:	0
Pct cm 12:	0	Pct pcm 12:	0
Pct na 12:	0	Pct aq 13:	0
Pct maq 13:	0	Pct cm 13:	0
Pct pcm 13:	0	Pct na 13:	0
Within sec:	N	Loc match:	Y
Aq code 1:	Not Reported		
Hit swl:	Not Reported		
Athk2:	0		
Horiz Conduct:	0		
Vert Conduct:	0		
T2:	0		
D50plek:	0		

B6
WNW **MI WELLS** **MI3000000052296**
1/4 - 1/2 Mile Higher

Wellid:	81000010160	Import id:	Not Reported
County:	Washtenaw	Township:	Scio
Town range:	02S 05E	Section:	3
Owner name:	COMMUNITY DEV. GROUP OF ANN AR		
Well addr:	1000 HURON RIVER		
Well depth:	183		
Well type:	Household		
Wssn:	0		
Well num:	Not Reported	Driller id:	524
Const date:	2000-02-16 14:08:45.000	Case type:	PVC Plastic
Case dia:	5		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Case depth:	175		
Screen frm:	173		
Screen to:	183		
Swl:	106		
Test depth:	116		
Test hours:	2		
Test rate:	10	Test methd:	Unknown
Grouted:	1	Pmp cpcity:	0
Latitude:	42.28178523		
Longitude:	-83.7598847		
Methd coll:	Address Matching-House Number		
Elevation:	837		
Elev methd:	Topographoc Map Interpolation	Depth flag:	Not Reported
Elev flag:	Not Reported		
Swl flag:	Not Reported		
Elev dem:	833	Elev dif:	4
Elev miv:	837	Aq code:	Drift Well
Aq flag:	Not Reported		
Pct aq:	16		
Pct aq d:	16	Pct aq r:	0
Pct maq:	0	Pct maq d:	0
Pct maq r:	0	Pct cm:	56
Pct cm d:	56	Pct cm r:	0
Pct pcm:	28	Pct pcm d:	28
Pct pcm r:	0	Pct na:	0
Pct na d:	0	Pct na r:	0
Pct flag:	Not Reported	Rock top:	-1
D r type:	Not Reported	Spc cpcity:	0
A thicknes:	8	A pct aq:	0
A pct maq:	0	A pct pcm:	100
A pct cm:	0	A pct na:	0
A thickns2:	77	A pct aq2:	12
A pct maq2:	0	A pct pcm2:	10
A pct cm2:	78	A pct na2:	0
A hit swl:	F	A hit top:	F
A hit rock:	F	A sc lith1:	Clay & Sand
A sc lmod1:	Fine	A sc lmaq1:	PCM
A sc lpct1:	80	A sc lith2:	Clay
A sc lmod2:	Not Reported	A sc lmaq2:	CM
A sc lpct2:	20	Pct aq 1:	0
Pct maq 1:	0	Pct cm 1:	100
Pct pcm 1:	0	Pct na 1:	0
Pct aq 2:	0	Pct maq 2:	0
Pct cm 2:	60	Pct pcm 2:	40
Pct na 2:	0	Pct aq 3:	0
Pct maq 3:	0	Pct cm 3:	0
Pct pcm 3:	100	Pct na 3:	0
Pct aq 4:	0	Pct maq 4:	0
Pct cm 4:	25	Pct pcm 4:	75
Pct na 4:	0	Pct aq 5:	70
Pct maq 5:	0	Pct cm 5:	30
Pct pcm 5:	0	Pct na 5:	0
Pct aq 6:	60	Pct maq 6:	0
Pct cm 6:	40	Pct pcm 6:	0
Pct na 6:	0	Pct aq 7:	0
Pct maq 7:	0	Pct cm 7:	100
Pct pcm 7:	0	Pct na 7:	0
Pct aq 8:	0	Pct maq 8:	0
Pct cm 8:	0	Pct pcm 8:	0
Pct na 8:	0	Pct aq 9:	0
Pct maq 9:	0	Pct cm 9:	0
Pct pcm 9:	0	Pct na 9:	0

Pct aq 10:	0	Pct maq 10:	0
Pct cm 10:	0	Pct pcm 10:	0
Pct na 10:	0	Pct aq 11:	0
Pct maq 11:	0	Pct cm 11:	0
Pct pcm 11:	0	Pct na 11:	0
Pct aq 12:	0	Pct maq 12:	0
Pct cm 12:	0	Pct pcm 12:	0
Pct na 12:	0	Pct aq 13:	0
Pct maq 13:	0	Pct cm 13:	0
Pct pcm 13:	0	Pct na 13:	0
Within sec:	N	Loc match:	Y
Aq code 1:	Not Reported		
Hit swl:	Not Reported		
Athk2:	0		
Horiz Conduct:	0		
Vert Conduct:	0		
T2:	0		
D50plek:	0		

7
NE
1/2 - 1 Mile
Higher

Site ID:	810292		
Groundwater Flow:	ENE	**AQUIFLOW**	**39428**
Shallowest Water Table Depth:	Not Reported		
Deepest Water Table Depth:	Not Reported		
Average Water Table Depth:	7		
Date:	01/10/1992		

8
WSW
1/2 - 1 Mile
Higher

MI WELLS **MI3000000051895**

Wellid:	81000005043	Import id:	81727630301
County:	Washtenaw	Township:	Ann Arbor
Town range:	02S 06E	Section:	30
Owner name:	CITY OF ANN ARBOR		
Well addr:	ANN ARBOR WELL #1 MONTGOMERY		
Well depth:	173		
Well type:	Type I public		
Wssn:	220		
Well num:	ANN ARBOR WELL #1 MONTGOMERY	Mfr id:	0
Const date:	1962-01-01 00:00:00.000	Case type:	Unknown
Case dia:	28		
Case depth:	132		
Screen frm:	0		
Screen to:	0		
Swl:	999.99		
Test depth:	0		
Test hours:	0		
Test rate:	1250	Test methd:	Unknown
Grouted:	1	Pmp cpcity:	1250
Latitude:	42.277985		
Longitude:	-83.764646		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Methd coll:	GPS Code Measurement Differential (DGPS)		
Elevation:	850		
Elev methd:	Topographoc Map Interpolation	Depth flag:	Not Reported
Elev flag:	Not Reported		
Swl flag:	SWL > Well Depth		
Elev dem:	846	Elev dif:	4
Elev miv:	850	Aq code:	Unknown Lithology
Aq flag:	Not Reported		
Pct aq:	0		
Pct aq d:	0	Pct aq r:	0
Pct maq:	0	Pct maq d:	0
Pct maq r:	0	Pct cm:	0
Pct cm d:	0	Pct cm r:	0
Pct pcm:	0	Pct pcm d:	0
Pct pcm r:	0	Pct na:	0
Pct na d:	0	Pct na r:	0
Pct flag:	Not Reported	Rock top:	-3
D r type:	Not Reported	Spc cpcity:	0
A thicknes:	0	A pct aq:	0
A pct maq:	0	A pct pcm:	0
A pct cm:	0	A pct na:	0
A thickns2:	0	A pct aq2:	0
A pct maq2:	0	A pct pcm2:	0
A pct cm2:	0	A pct na2:	0
A hit swl:	F	A hit top:	F
A hit rock:	F	A sc lith1:	Not Reported
A sc lmod1:	Not Reported	A sc lmaq1:	Not Reported
A sc lpct1:	0	A sc lith2:	Not Reported
A sc lmod2:	Not Reported	A sc lmaq2:	Not Reported
A sc lpct2:	0	Pct aq 1:	0
Pct maq 1:	0	Pct cm 1:	0
Pct pcm 1:	0	Pct na 1:	100
Pct aq 2:	0	Pct maq 2:	0
Pct cm 2:	0	Pct pcm 2:	0
Pct na 2:	100	Pct aq 3:	0
Pct maq 3:	0	Pct cm 3:	0
Pct pcm 3:	0	Pct na 3:	100
Pct aq 4:	0	Pct maq 4:	0
Pct cm 4:	0	Pct pcm 4:	0
Pct na 4:	100	Pct aq 5:	0
Pct maq 5:	0	Pct cm 5:	0
Pct pcm 5:	0	Pct na 5:	100
Pct aq 6:	0	Pct maq 6:	0
Pct cm 6:	0	Pct pcm 6:	0
Pct na 6:	100	Pct aq 7:	0
Pct maq 7:	0	Pct cm 7:	0
Pct pcm 7:	0	Pct na 7:	100
Pct aq 8:	0	Pct maq 8:	0
Pct cm 8:	0	Pct pcm 8:	0
Pct na 8:	0	Pct aq 9:	0
Pct maq 9:	0	Pct cm 9:	0
Pct pcm 9:	0	Pct na 9:	0
Pct aq 10:	0	Pct maq 10:	0
Pct cm 10:	0	Pct pcm 10:	0
Pct na 10:	0	Pct aq 11:	0
Pct maq 11:	0	Pct cm 11:	0
Pct pcm 11:	0	Pct na 11:	0
Pct aq 12:	0	Pct maq 12:	0
Pct cm 12:	0	Pct pcm 12:	0
Pct na 12:	0	Pct aq 13:	0
Pct maq 13:	0	Pct cm 13:	0
Pct pcm 13:	0	Pct na 13:	0

Within sec:	Y	Loc match:	Y
Aq code 1:	Not Reported		
Hit swl:	Not Reported		
Athk2:	0		
Horiz Conduct:	0		
Vert Conduct:	0		
T2:	0		
D50plek:	0		

9
NNE
1/2 - 1 Mile
Lower

AQUIFLOW **45843**

Site ID:	Not Reported
Groundwater Flow:	Not Reported
Shallowest Water Table Depth:	Not Reported
Deepest Water Table Depth:	Not Reported
Average Water Table Depth:	3.5
Date:	12/17/1991

10
SE
1/2 - 1 Mile
Higher

AQUIFLOW **39435**

Site ID:	810427
Groundwater Flow:	NNW
Shallowest Water Table Depth:	Not Reported
Deepest Water Table Depth:	Not Reported
Average Water Table Depth:	25.3
Date:	09/24/1996

11
WSW
1/2 - 1 Mile
Higher

MI WELLS **MI3000000051505**

Wellid:	81000005042	Import id:	81727630001
County:	Washtenaw	Township:	Ann Arbor
Town range:	02S 06E	Section:	30
Owner name:	SNYDER, DORIS K.		
Well addr:	5 RIDGEMOOR DR.		
Well depth:	112		
Well type:	Household		
Wssn:	0		
Well num:	Not Reported	Driller id:	26
Const date:	1984-08-31 00:00:00.000	Case type:	Steel-black
Case dia:	4		
Case depth:	108		
Screen frm:	108		
Screen to:	112		
Swl:	63		
Test depth:	85		
Test hours:	1		
Test rate:	20	Test methd:	Unknown
Grouted:	1	Pmp cpcity:	0
Latitude:	42.2744577482		
Longitude:	-83.7672956333		
Methd coll:	Interpolation-Map		
Elevation:	918		
Elev methd:	Topographoc Map Interpolation	Depth flag:	Not Reported
Elev flag:	Not Reported		
Swl flag:	Not Reported		
Elev dem:	912	Elev dif:	6
Elev miv:	918	Aq code:	Drift Well
Aq flag:	Not Reported		
Pct aq:	52		
Pct aq d:	52	Pct aq r:	0
Pct maq:	0	Pct maq d:	0
Pct maq r:	0	Pct cm:	48

Pct cm d:	48	Pct cm r:	0
Pct pcm:	0	Pct pcm d:	0
Pct pcm r:	0	Pct na:	0
Pct na d:	0	Pct na r:	0
Pct flag:	Not Reported	Rock top:	-1
D r type:	Not Reported	Spc cpcity:	0
A thicknes:	23	A pct aq:	100
A pct maq:	0	A pct pcm:	0
A pct cm:	0	A pct na:	0
A thickns2:	49	A pct aq2:	47
A pct maq2:	0	A pct pcm2:	0
A pct cm2:	53	A pct na2:	0
A hit swl:	F	A hit top:	F
A hit rock:	F	A sc lith1:	Gravel
A sc lmod1:	Water Bearing	A sc lmaq1:	AQ
A sc lpct1:	100	A sc lith2:	Not Reported
A sc lmod2:	Not Reported	A sc lmaq2:	Not Reported
A sc lpct2:	0	Pct aq 1:	5
Pct maq 1:	0	Pct cm 1:	95
Pct pcm 1:	0	Pct na 1:	0
Pct aq 2:	100	Pct maq 2:	0
Pct cm 2:	0	Pct pcm 2:	0
Pct na 2:	0	Pct aq 3:	70
Pct maq 3:	0	Pct cm 3:	30
Pct pcm 3:	0	Pct na 3:	0
Pct aq 4:	0	Pct maq 4:	0
Pct cm 4:	100	Pct pcm 4:	0
Pct na 4:	0	Pct aq 5:	55
Pct maq 5:	0	Pct cm 5:	45
Pct pcm 5:	0	Pct na 5:	0
Pct aq 6:	0	Pct maq 6:	0
Pct cm 6:	0	Pct pcm 6:	0
Pct na 6:	0	Pct aq 7:	0
Pct maq 7:	0	Pct cm 7:	0
Pct pcm 7:	0	Pct na 7:	0
Pct aq 8:	0	Pct maq 8:	0
Pct cm 8:	0	Pct pcm 8:	0
Pct na 8:	0	Pct aq 9:	0
Pct maq 9:	0	Pct cm 9:	0
Pct pcm 9:	0	Pct na 9:	0
Pct aq 10:	0	Pct maq 10:	0
Pct cm 10:	0	Pct pcm 10:	0
Pct na 10:	0	Pct aq 11:	0
Pct maq 11:	0	Pct cm 11:	0
Pct pcm 11:	0	Pct na 11:	0
Pct aq 12:	0	Pct maq 12:	0
Pct cm 12:	0	Pct pcm 12:	0
Pct na 12:	0	Pct aq 13:	0
Pct maq 13:	0	Pct cm 13:	0
Pct pcm 13:	0	Pct na 13:	0
Within sec:	Y	Loc match:	Y
Aq code 1:	D		
Hit swl:	F		
Athk2:	49		
Horiz Conduct:	140.81638		
Vert Conduct:	.00019		
T2:	6900.0026		
D50plek:	533.34275		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: MI Radon

Radon Test Results

Zipcode	Test Date	LT Sign	Result
48103	1/28/2006		1.3
48103	2/13/2006		1.3
48103	2/20/2006		1.3
48103	2/13/2006		1.3
48103	2/10/2006		1.3
48103	2/20/1996		1.3
48103	1/15/2003		1.3
48103	5/15/2003		1.3
48103	11/7/2002		1.3
48103	3/30/2004		1.3
48103	12/20/2003		1.3
48103	6/25/2004		1.3
48103	3/14/2009		1.3
48103	2/12/1999		1.2
48103	4/15/1996		1.2
48103	1/31/2003		1.2
48103	4/3/2008		1.2
48103	7/6/2001		1.2
48103	8/28/2002		1.2
48103	8/20/2003		1.2
48103	5/1/2003		1.2
48103	4/25/2005		1.2
48103	2/16/2004		1.2
48103	1/21/2005		1.2
48103	3/1/2005		1.2
48103	2/6/2006		1.2
48103	1/19/2006		1.2
48103	12/12/2006		1.2
48103	2/13/2006		1.2
48103	12/18/1995		1.1
48103	2/7/2003		1.1
48103	2/14/2005		1.1
48103	4/15/2005		1.1
48103	7/5/1995		1.1
48103	11/9/2001		1.1
48103	10/3/2000		1.2
48103	2/2/2009		1.2
48103	2/17/2009		1.2
48103	1/7/2010		1.2
48103	10/24/2007		1.1
48103	3/24/1995		1.1
48103	3/13/1995		1.1
48103	11/4/2004		1.1
48103	3/27/2006		1.1
48103	4/17/2006		1.1
48103	2/13/2006		1.1
48103			

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	2/9/2006		1.1
48103	2/13/2006		1.1
48103	2/8/2006		1.1
48103	6/16/2006		1.1
48103	2/12/2008		1.1
48103	4/4/2003		1.0
48103	11/5/2004		1.0
48103	12/1/2008		1.1
48103	2/17/2009		1.1
48103	2/2/2009		1.1
48103	2/15/1999		1.0
48103	9/6/2005		1.9
48103	3/7/2005		1.9
48103	3/4/2006		1.9
48103	4/10/2006		1.9
48103	3/23/2006		1.9
48103	11/5/2001		1.9
48103	4/14/1997		1.9
48103	3/30/1998		1.9
48103	1/24/1996		1.9
48103	6/1/2002		1.9
48103	2/1/2003		1.9
48103	2/7/2003		1.9
48103	11/12/2004		1.9
48103	1/14/1995		1.0
48103	8/19/1994		1.0
48103	3/1/2007		1.0
48103	2/4/2006		1.0
48103	4/3/2006		1.0
48103	2/13/2006		1.0
48103	5/26/2009		1.0
48103	1/4/2008		1.0
48103	4/9/2007		1.0
48103	3/15/2008		1.0
48103	6/7/1995		1.8
48103	2/8/1999		1.8
48103	8/16/2003		1.8
48103	2/4/2006		1.9
48103	2/20/2006		1.9
48103	2/11/2006		1.9
48103	2/21/2006		1.9
48103	2/1/2006		1.9
48103	5/8/2006		1.9
48103	4/5/2008		1.9
48103	4/8/2008		1.9
48103	12/10/1999		1.9
48103	3/27/2009		1.9
48103	4/24/2006	<	0.3
48103	3/17/2008	<	0.3
48103	3/3/2007	<	0.3
48103	3/9/2007	<	0.3
48103	3/2/2007	<	0.3
48103	3/25/1997	<	0.3
48103	10/20/2006	<	0.3
48103	2/8/2006	<	0.3
48103	8/25/1995	<	0.3
48103			

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	7/26/2005	<	0.3
48103	7/25/2005	<	0.3
48103	6/6/2005	<	0.3
48103	2/8/2006	<	0.3
48103	2/9/2006	<	0.3
48103	1/16/2004		0.5
48103	2/9/2004		0.5
48103	8/10/1995		0.3
48103	1/13/2004	<	0.3
48103	2/2/2006	<	0.3
48103	1/21/2004	<	0.3
48103	4/9/2004	<	0.3
48103	2/9/2006		0.5
48103	2/13/2006		0.5
48103	4/18/2008		0.5
48103	11/1/2001	<	0.3
48103	5/1/2006	<	0.3
48103	1/30/2006	<	0.3
48103	1/26/2006	<	0.3
48103	1/24/2006	<	0.3
48103	2/14/2006	<	0.3
48103	2/24/2007		0.5
48103	3/13/2003	<	0.3
48103	3/17/2003	<	0.3
48103	4/7/2003	<	0.3
48103	7/24/2002	<	0.3
48103	10/22/2002	<	0.3
48103	3/11/2000		0.5
48103	4/15/2009		0.5
48103	11/19/2009		0.5
48103	3/9/2007	<	0.3
48103	6/12/2008	<	0.3
48103	2/11/2002	<	0.3
48103	2/28/2004	<	0.3
48103	5/20/2008	<	0.3
48103	9/6/1994		0.4
48103	3/8/2004	<	0.3
48103	2/10/2004	<	0.3
48103	1/23/2008	<	0.3
48103	1/31/2008	<	0.3
48103	2/11/1999	<	0.3
48103	1/7/1998	<	0.3
48103	5/15/2002	<	0.3
48103	6/6/2002	<	0.3
48103	5/19/2003	<	0.3
48103	6/25/2007	<	0.3
48103	4/9/2007	<	0.3
48103	3/5/2002	<	0.3
48103	3/21/2006	<	0.3
48103	3/4/2006	<	0.3
48103	1/19/2007	<	0.3
48103	1/17/2007	<	0.3
48103	3/4/2006	<	0.3
48103	1/8/2007	<	0.3
48103	3/27/2006	<	0.3
48103	4/22/1997	<	0.3
48103			

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	12/20/1995	0.8
48103	2/20/2003	0.5
48103	1/20/2003	0.5
48103	2/11/2003	0.5
48103	2/17/2009	1.0
48103	2/17/2009	1.0
48103	1/7/1998	0.8
48103	1/10/2003	0.8
48103	2/16/2002	0.8
48103	4/30/2005	0.7
48103	4/25/2005	0.7
48103	12/31/1993	0.9
48103	8/21/2003	0.8
48103	9/11/1995	0.9
48103	10/17/2005	0.6
48103	8/23/2003	0.9
48103	11/5/2001	0.9
48103	5/22/2003	0.9
48103	2/24/2004	0.6
48103	11/5/2004	0.6
48103	1/27/2006	0.6
48103	1/31/2005	0.8
48103	1/24/2004	0.8
48103	2/4/2006	0.7
48103	2/1/2003	0.9
48103	2/2/2007	0.6
48103	2/13/2006	0.8
48103	2/8/2007	0.7
48103	10/20/2008	0.7
48103	4/24/2006	0.8
48103	4/5/2008	0.7
48103	8/18/2007	0.7
48103	5/16/2005	0.9
48103	12/10/2007	0.8
48103	3/7/2006	0.9
48103	2/20/2006	0.9
48103	2/10/2006	0.9
48103	2/20/2006	0.9
48103	2/10/2006	0.9
48103	6/5/1999	0.6
48103	3/1/2008	0.8
48103	11/28/1994	0.7
48103	2/24/1995	0.7
48103	9/21/2000	0.7
48103	11/21/2005	0.9
48103	6/29/2001	0.8
48103	2/10/2009	0.6
48103	11/2/2007	0.9
48103	1/7/2008	0.9
48103	11/19/2009	0.6
48103	5/27/1994	0.8
48103	1/26/2009	0.8
48103	2/5/2009	0.7
48103	4/23/1997	0.6
48103	5/3/1996	0.6
48103	4/27/1995	0.9
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	8/27/1996	0.5
48103	12/2/1996	0.5
48103	11/23/2009	0.8
48103	2/17/2009	0.8
48103	11/9/2001	0.7
48103	1/7/1998	0.6
48103	12/2/1996	0.6
48103	2/19/2003	0.6
48103	11/22/2002	0.6
48103	6/12/2009	0.9
48103	3/19/2002	0.5
48103	10/21/1996	0.7
48103	2/7/2003	0.7
48103	3/13/2002	0.7
48103	7/5/2003	0.6
48103	3/29/2002	0.6
48103	1/25/2003	0.6
48103	9/2/2009	0.9
48103	4/21/1995	1.8
48103	3/21/2009	1.8
48103	5/9/2009	1.8
48103	11/12/2009	1.8
48103	11/4/2005	1.8
48103	2/10/2006	1.8
48103	2/9/2006	1.8
48103	2/27/2006	1.8
48103	2/20/2006	1.8
48103	12/16/2006	1.8
48103	5/22/2009	2.9
48103	9/6/2007	2.9
48103	3/3/2008	2.9
48103	5/13/1999	2.8
48103	3/16/1995	2.8
48103	12/21/2009	2.8
48103	11/3/2009	2.7
48103	3/15/1997	2.6
48103	3/5/1999	2.6
48103	2/24/2009	2.6
48103	6/22/2009	2.6
48103	4/4/2000	2.9
48103	2/3/2000	2.9
48103	5/31/1999	2.9
48103	2/6/2001	2.9
48103	5/22/2006	2.5
48103	3/25/1994	2.5
48103	1/23/1996	2.5
48103	4/18/1997	2.5
48103	6/14/2003	2.5
48103	1/3/2006	2.5
48103	8/18/2007	2.5
48103	3/16/2007	2.5
48103	10/20/1994	2.5
48103	8/8/1994	2.5
48103	2/25/2000	2.5
48103	4/19/1999	2.5
48103	3/2/1995	2.5
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	1/14/2009	2.5
48103	2/6/2009	2.5
48103	2/12/2009	2.5
48103	1/30/2009	2.5
48103	7/13/2009	2.5
48103	8/30/1997	2.4
48103	2/1/2003	2.4
48103	9/3/2002	2.4
48103	2/14/2004	2.4
48103	9/27/2004	2.4
48103	6/26/2006	2.4
48103	9/5/2007	2.4
48103	4/8/2008	2.4
48103	11/24/2008	2.4
48103	4/17/2006	2.2
48103	2/10/2006	2.2
48103	1/24/2009	2.4
48103	3/16/2009	2.4
48103	4/20/1994	2.3
48103	3/21/2008	2.2
48103	3/9/2009	2.3
48103	4/10/2009	2.3
48103	7/6/2001	2.2
48103	12/6/1999	2.2
48103	3/6/2003	2.3
48103	4/18/2003	2.3
48103	3/14/1998	2.2
48103	6/18/1994	2.2
48103	9/6/1994	2.2
48103	9/15/1994	2.2
48103	10/1/2004	2.3
48103	6/12/1996	2.2
48103	2/26/2009	2.2
48103	12/29/1997	2.1
48103	8/19/2005	2.3
48103	3/1/2005	2.3
48103	2/28/2005	2.2
48103	3/2/1999	2.1
48103	2/16/1996	2.1
48103	9/12/1997	2.1
48103	2/6/2006	2.3
48103	2/9/2007	2.3
48103	2/3/2007	2.3
48103	2/4/2006	2.3
48103	2/27/2006	2.3
48103	2/26/2004	2.2
48103	2/7/2004	2.2
48103	2/6/2006	2.2
48103	3/26/2002	2.1
48103	11/2/2001	2.1
48103	6/26/2006	3.0
48103	4/25/2006	3.0
48103	4/10/2006	3.0
48103	4/3/2006	3.0
48103	12/10/2007	3.0
48103	1/10/2009	2.9
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	2/5/2009	2.9
48103	2/13/2009	2.9
48103	3/2/2009	2.9
48103	2/8/1996	2.7
48103	11/5/2001	2.7
48103	5/8/2002	2.7
48103	3/21/2003	2.6
48103	2/8/2008	3.0
48103	2/25/2000	3.0
48103	1/10/2003	2.7
48103	2/9/2005	2.7
48103	1/13/2005	2.7
48103	11/7/2001	2.6
48103	4/4/2005	2.6
48103	8/27/2004	2.6
48103	5/26/2000	3.0
48103	11/20/2003	2.8
48103	1/21/2002	2.8
48103	2/3/2003	2.8
48103	1/29/2003	2.8
48103	2/14/2004	2.7
48103	7/11/2006	2.7
48103	12/6/2006	2.7
48103	1/31/2006	2.6
48103	2/16/2007	2.6
48103	2/5/2007	2.6
48103	1/28/2006	2.6
48103	12/12/2005	2.6
48103	1/24/2006	2.6
48103	2/13/2006	2.6
48103	2/9/2006	2.6
48103	11/27/1998	2.9
48103	4/14/1997	2.9
48103	2/7/1994	2.9
48103	1/31/1994	2.9
48103	7/16/2004	2.8
48103	2/4/2006	2.8
48103	3/10/2006	2.8
48103	2/2/2007	2.8
48103	11/28/2005	2.8
48103	2/6/2006	2.7
48103	4/22/2006	2.7
48103	12/10/2007	2.7
48103	2/13/2007	2.6
48103	5/22/2009	2.6
48103	3/3/2007	2.6
48103	11/9/2007	2.6
48103	5/3/2003	2.9
48103	2/25/2002	2.9
48103	2/25/2002	2.9
48103	1/25/2003	2.9
48103	6/1/2002	2.9
48103	1/28/2003	2.9
48103	9/6/2005	2.9
48103	5/1/2006	2.8
48103	2/12/2007	2.8
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	2/9/2007		2.8
48103	1/30/2006		2.8
48103	1/14/2008		2.8
48103	7/2/1994		2.6
48103	11/29/1994		2.6
48103	11/6/2000		2.6
48103	6/16/2005		2.9
48103	2/20/2006		2.9
48103	2/22/2007		2.9
48103	2/6/2006		2.9
48103	5/16/2008		2.8
48103	10/12/2007		2.8
48103	5/7/2007		2.8
48103	12/21/2009		2.7
48103	2/14/2009		2.7
48103	3/2/2009		2.7
48103	3/19/2009	<	0.3
48103	2/6/2006		3.8
48103	11/7/2005		3.8
48103	7/24/2006		3.8
48103	2/2/2007		3.8
48103	1/10/2008		3.8
48103	1/18/2008		3.8
48103	2/20/2007		3.8
48103	12/8/2004		3.6
48103	8/27/2004		3.6
48103	3/31/2004		3.6
48103	2/16/2007		3.6
48103	2/25/2008	<	0.3
48103	3/9/2007	<	0.3
48103	2/23/2009	<	0.3
48103	2/24/2009	<	0.3
48103	2/7/2001		3.8
48103	11/12/2009		3.8
48103	1/26/2007		3.6
48103	12/19/2005		3.6
48103	2/6/2006		3.6
48103	11/9/2007		3.6
48103	1/29/2009		3.6
48103	1/31/2009		3.6
48103	4/3/2009		3.6
48103	2/6/2009		3.6
48103	10/28/1997		3.5
48103	4/7/2004		3.5
48103	7/12/2005		3.5
48103	6/16/2004		3.5
48103	1/15/2004		3.5
48103	11/13/2004		3.5
48103	12/2/1994	<	0.3
48103	3/14/1995	<	0.3
48103	3/27/2009		3.5
48103	2/28/2005		3.5
48103	2/13/2006		3.5
48103	8/4/2006		3.5
48103	2/6/2006		3.5
48103	1/30/2006		3.5
48103			

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	5/22/2007		3.5
48103	8/3/1998		3.4
48103	1/31/1994		3.4
48103	10/15/1998		3.4
48103	1/16/2003		3.4
48103	10/14/2004		3.4
48103	2/6/2007		3.4
48103	1/30/2006		3.4
48103	5/1/2006		3.4
48103	2/13/2006		3.4
48103	2/9/2006		3.4
48103	6/5/2006		3.4
48103	10/24/2000	<	0.3
48103	10/25/2000	<	0.3
48103	2/11/2003		3.2
48103	1/30/2003		3.2
48103	5/31/2003		3.2
48103	10/29/2001		3.2
48103	12/20/2001		3.2
48103	5/16/2002		3.2
48103	1/6/2007		3.1
48103	1/27/2006		3.1
48103	9/21/2000	<	0.3
48103	9/21/2000	<	0.3
48103	8/7/2000	<	0.3
48103	3/4/2006		3.2
48103	4/22/2006		3.2
48103	2/15/2006		3.2
48103	2/4/2006		3.2
48103	10/17/2008		3.1
48103	3/15/2008		3.1
48103	3/5/2009		3.4
48103	8/20/2001		3.3
48103	11/16/1996		3.3
48103	2/12/1999		3.3
48103	1/26/2001	<	0.3
48103	2/9/2001	<	0.3
48103	7/5/1994		3.1
48103	10/30/2002		3.3
48103	3/10/2003		3.3
48103	2/18/2004		3.3
48103	11/16/2006		3.2
48103	11/15/2007		3.2
48103	6/14/1999	<	0.3
48103	6/21/1999	<	0.3
48103	6/19/1999	<	0.3
48103	12/10/2004		3.3
48103	2/6/2006		3.3
48103	2/13/2007		3.3
48103	2/8/2006		3.3
48103	2/6/2006		3.3
48103	7/22/2008		3.2
48103	3/15/2008		3.2
48103	12/10/1994		3.2
48103	1/24/2001		3.2
48103	3/6/2009		3.1
48103			

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	1/9/2010		3.1
48103	2/10/2009		3.1
48103	2/4/2009		3.2
48103	8/3/1998		3.1
48103	2/15/1999		3.1
48103	10/19/1998		3.0
48103	2/18/1999		3.0
48103	2/22/1999		3.0
48103	11/3/2003		3.0
48103	11/9/2007		3.3
48103	2/8/1999		3.9
48103	2/24/2003		3.9
48103	12/13/2002		3.9
48103	3/28/2003		3.9
48103	6/26/2003		3.9
48103	2/6/2009		3.8
48103	11/29/1995		3.7
48103	10/14/1995		3.7
48103	11/2/2002		3.1
48103	8/17/2009	<	0.3
48103	2/2/2004		3.9
48103	1/24/2005		3.9
48103	11/13/2004		3.9
48103	10/16/2006		3.9
48103	1/28/2003		3.7
48103	10/17/2005		3.7
48103	2/14/2005		3.7
48103	11/22/2004		3.7
48103	9/6/2005		3.7
48103	10/31/2005		3.7
48103	2/15/2005		3.0
48103	3/7/2005		3.0
48103	2/6/2004		3.0
48103	12/11/2009	<	0.3
48103	3/30/2006		3.9
48103	11/9/2007		3.9
48103	1/18/1995		3.9
48103	9/10/1999		3.9
48103	1/10/2000		3.9
48103	4/9/2007		3.7
48103	2/9/2006		3.7
48103	2/8/2007		3.7
48103	3/20/2008		3.7
48103	8/17/1999		3.3
48103	4/3/2009		3.3
48103	11/10/2009	<	0.3
48103	11/2/2009	<	0.3
48103	3/2/2009		3.9
48103	2/26/2009		3.9
48103	6/9/2007		3.7
48103	12/14/2007		3.7
48103	2/26/2007		3.7
48103	10/31/2008		3.7
48103	10/29/2007		3.7
48103	7/27/2007		3.7
48103	6/3/1994		3.7
48103			

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	3/6/2003		3.1
48103	11/2/2001		3.1
48103	12/17/2004		3.1
48103	2/15/2005		3.1
48103	11/1/2004		3.1
48103	3/27/1998		3.8
48103	4/4/2000		3.7
48103	3/20/2009		3.7
48103	2/14/2009		3.7
48103	6/24/2009		3.7
48103	3/27/2009		3.7
48103	7/9/1994		3.4
48103	4/20/1999		3.4
48103	6/29/2009	<	0.3
48103	4/15/2009	<	0.3
48103	10/30/2001		3.8
48103	3/20/2003		3.8
48103	12/13/2001		3.8
48103	12/1/2003		3.8
48103	8/2/2005		3.8
48103	5/14/2005		3.8
48103	11/5/2001		3.6
48103	4/14/1997		3.2
48103	2/27/2009	<	0.3
48103	2/27/2009	<	0.3
48103	2/26/2009	<	0.3
48103	3/4/2006		1.7
48103	4/28/2007		1.7
48103	2/16/1999		1.7
48103	11/16/2001		1.7
48103	6/17/2002		1.7
48103	8/11/2003		1.7
48103	10/27/2001		1.7
48103	3/13/2003		1.7
48103	10/29/2002		1.7
48103	2/22/2003		1.7
48103	6/25/2004		1.7
48103	11/3/2004		1.7
48103	3/26/2004		1.7
48103	4/21/2005		1.7
48103	2/15/2005		1.7
48103	2/16/2007		1.7
48103	2/6/2006		1.7
48103	1/14/2003		7.6
48103	2/14/2004		7.6
48103	3/3/2007		7.6
48103	3/27/2009		7.3
48103	12/14/1998		7.2
48103	9/26/2006		7.2
48103	2/4/2006		7.2
48103	9/2/2008		6.9
48103	1/14/2000		6.9
48103	3/14/2009		6.9
48103	11/28/1997		6.8
48103	4/16/2005		6.6
48103	4/10/2006		6.6
48103			

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
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AREA RADON INFORMATION

	10/23/2007	6.6
48103	8/11/2008	6.6
48103	7/17/2001	6.6
48103	1/24/2000	7.6
48103	4/6/2009	7.6
48103	2/22/1999	7.5
48103	5/1/2003	7.5
48103	2/2/2007	7.5
48103	2/7/2006	7.5
48103	6/5/1999	7.2
48103	1/24/2009	7.2
48103	12/21/2002	7.1
48103	10/17/2005	7.1
48103	2/20/2006	6.8
48103	11/7/2007	6.8
48103	7/13/2009	6.8
48103	4/24/2003	6.5
48103	3/16/2005	6.5
48103	6/11/2004	6.5
48103	2/25/2006	6.5
48103	1/26/2006	6.5
48103	4/16/2008	6.5
48103	8/18/2007	6.5
48103	7/24/2007	6.5
48103	4/28/2007	6.5
48103	8/13/1999	6.5
48103	2/12/2009	6.5
48103	4/3/2009	6.5
48103	4/3/2009	6.5
48103	2/7/2003	6.4
48103	6/1/2002	6.4
48103	2/27/2007	6.4
48103	6/9/2008	6.4
48103	7/21/1994	6.4
48103	11/13/2009	6.4
48103	5/22/2009	6.4
48103	4/13/2009	6.3
48103	11/9/2009	6.3
48103	11/3/2009	6.3
48103	11/3/1997	6.2
48103	7/15/1996	6.2
48103	2/4/1994	6.2
48103	6/5/2003	6.2
48103	10/17/2001	6.2
48103	2/24/2003	6.2
48103	1/22/2007	6.2
48103	2/27/2007	6.2
48103	1/28/2006	6.2
48103	11/22/2008	6.2
48103	12/6/2005	6.1
48103	6/14/1999	6.1
48103	6/9/2006	4.9
48103	2/9/2006	4.9
48103	2/17/2006	4.9
48103	3/13/2006	4.9
48103	12/10/2007	4.9
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	2/28/2009	6.1
48103	3/7/1994	6.0
48103	8/24/2002	6.0
48103	6/2/2003	6.0
48103	8/1/2005	6.0
48103	4/2/2004	6.0
48103	5/25/2006	5.6
48103	1/20/2007	5.6
48103	1/12/2008	5.6
48103	11/9/2007	5.6
48103	1/25/2010	5.6
48103	4/17/2006	5.2
48103	11/23/2007	5.2
48103	12/24/2008	5.2
48103	4/10/2007	5.2
48103	4/3/2004	4.6
48103	2/10/2007	4.6
48103	1/24/2006	4.6
48103	1/26/2006	6.0
48103	1/28/2006	6.0
48103	10/11/2008	6.0
48103	1/15/2000	6.0
48103	12/8/2009	6.0
48103	2/12/2009	5.6
48103	9/17/1998	5.5
48103	4/24/1996	5.5
48103	2/15/2000	5.2
48103	7/3/2009	5.2
48103	3/28/1998	5.1
48103	6/11/2001	4.9
48103	2/12/2009	4.9
48103	2/13/1998	4.8
48103	8/3/1998	4.8
48103	3/27/1999	5.9
48103	2/19/1996	5.9
48103	2/16/1999	5.9
48103	3/8/1997	5.9
48103	2/9/2002	5.9
48103	12/17/2001	5.9
48103	4/5/2003	5.9
48103	12/9/2003	5.9
48103	11/28/2005	5.9
48103	4/19/2004	5.9
48103	12/26/2009	5.5
48103	2/28/2003	5.1
48103	6/1/2002	5.1
48103	7/31/2009	4.8
48103	12/3/2008	4.8
48103	4/14/1997	4.7
48103	10/4/1995	4.7
48103	2/11/2006	5.9
48103	10/24/2007	5.9
48103	9/15/2008	5.9
48103	7/1/1999	5.9
48103	5/5/1999	5.9
48103	3/27/2000	5.9
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	1/27/2000	5.9
48103	2/20/2009	5.9
48103	11/16/2009	5.9
48103	2/17/2009	5.9
48103	4/6/2009	5.5
48103	12/8/2008	5.5
48103	11/24/1997	5.4
48103	11/24/1997	5.4
48103	1/23/2003	5.4
48103	5/9/2003	5.4
48103	12/22/2003	5.4
48103	1/28/2006	5.1
48103	4/9/2007	5.1
48103	2/20/1995	5.1
48103	1/13/2003	4.7
48103	8/7/2003	4.7
48103	3/28/2005	4.7
48103	1/29/2003	5.8
48103	2/15/2005	5.8
48103	4/27/2006	5.8
48103	2/14/2006	5.4
48103	2/13/2006	5.4
48103	3/22/2007	5.4
48103	10/30/1995	5.0
48103	8/15/1997	5.0
48103	2/12/1999	5.0
48103	2/7/2003	5.0
48103	2/27/2003	5.0
48103	10/29/2001	5.0
48103	1/20/2003	5.0
48103	1/25/2003	4.8
48103	11/5/2002	4.8
48103	4/2/2003	4.8
48103	11/1/2001	4.8
48103	7/5/2005	4.8
48103	2/20/2006	4.8
48103	3/27/2009	5.4
48103	1/24/2009	5.4
48103	1/24/2009	5.4
48103	5/1/1997	5.3
48103	1/5/2002	5.3
48103	2/2/2007	5.0
48103	3/14/2006	5.0
48103	1/28/2006	5.0
48103	2/15/2000	4.7
48103	11/2/2009	4.7
48103	8/7/2009	4.7
48103	2/5/2002	5.7
48103	4/23/2005	5.7
48103	6/22/2006	5.7
48103	8/2/2004	5.3
48103	1/28/2006	5.3
48103	2/13/2006	5.3
48103	2/11/2006	5.3
48103	6/22/2001	5.0
48103	8/25/2006	4.7
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	4/18/2008	4.7
48103	5/22/2009	4.7
48103	2/15/2000	4.7
48103	4/21/2008	5.7
48103	9/24/2007	5.7
48103	12/10/2005	5.3
48103	6/9/2008	5.3
48103	10/2/2008	5.3
48103	2/21/2009	5.3
48103	3/1/1999	4.9
48103	5/20/1997	4.9
48103	11/5/2002	4.9
48103	1/15/2002	4.9
48103	2/3/2003	4.9
48103	4/9/2002	4.9
48103	4/30/2004	4.9
48103	1/18/2007	4.8
48103	3/21/2008	4.8
48103	2/8/1999	5.6
48103	2/16/1998	5.6
48103	10/27/2001	5.6
48103	12/26/2009	5.3
48103	3/5/1998	5.2
48103	7/20/1995	5.2
48103	2/3/2003	5.2
48103	4/11/2003	5.2
48103	6/1/2002	5.2
48103	12/22/2003	5.2
48103	7/5/2005	5.2
48103	12/19/1996	7.9
48103	3/21/2002	7.9
48103	11/1/2002	7.9
48103	1/18/2002	7.9
48103	3/5/2007	7.9
48103	10/24/2007	7.5
48103	5/2/2000	7.5
48103	8/21/2000	7.5
48103	9/29/1999	7.5
48103	7/13/2009	7.5
48103	1/21/2002	7.4
48103	1/16/2003	7.4
48103	8/19/2005	7.4
48103	2/18/2005	7.4
48103	2/5/2007	7.1
48103	8/9/2007	7.1
48103	2/17/2009	7.1
48103	6/27/1995	7.0
48103	3/5/1999	7.0
48103	9/1/1998	6.7
48103	9/29/1997	6.7
48103	1/29/2003	6.7
48103	11/26/2001	6.7
48103	2/13/2003	6.7
48103	2/2/2007	6.7
48103	4/13/2009	7.9
48103	4/3/2006	7.8
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	2/13/2006	7.4
48103	12/11/2009	7.4
48103	9/6/1997	7.3
48103	2/20/2006	7.0
48103	5/22/2008	6.7
48103	2/7/2000	6.7
48103	7/2/2001	6.7
48103	2/6/2009	6.7
48103	11/21/2009	6.7
48103	4/3/1999	7.8
48103	2/10/2000	7.8
48103	1/24/2009	7.8
48103	1/26/2009	7.8
48103	2/2/2007	7.7
48103	5/7/2003	7.3
48103	10/26/2002	7.3
48103	2/11/2003	7.3
48103	2/15/2006	7.3
48103	5/4/2006	7.3
48103	1/21/1995	7.3
48103	12/3/2001	6.9
48103	2/28/2002	6.9
48103	1/17/2009	2.0
48103	3/5/2009	2.0
48103	5/28/1994	25.5
48103	2/15/2006	25.3
48103	2/20/2006	23.8
48103	12/11/2002	23.6
48103	4/2/1997	23.4
48103	3/10/2009	18.3
48103	5/8/2003	18.2
48103	6/6/2002	18.1
48103	12/9/2002	17.6
48103	7/8/2003	2.0
48103	7/18/2003	2.0
48103	11/12/2001	2.0
48103	10/6/2003	2.0
48103	4/9/1997	59.5
48103	2/7/2006	49.8
48103	1/8/2007	49.2
48103	3/11/1996	48.9
48103	6/27/2008	48.5
48103	3/18/1999	44.8
48103	4/3/2006	42.1
48103	1/27/2009	23.1
48103	11/1/2004	22.6
48103	10/14/1996	22.2
48103	2/6/2009	21.9
48103	2/10/2003	17.4
48103	4/15/2006	17.1
48103	10/29/2001	16.9
48103	4/3/2009	16.9
48103	11/20/2004	16.8
48103	1/10/2003	16.7
48103	2/20/1999	16.3
48103	7/31/2006	16.1
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	10/22/2007	16.1
48103	1/22/2008	16.0
48103	2/9/2009	16.0
48103	12/7/2005	15.9
48103	11/14/2002	15.7
48103	12/1/1997	14.1
48103	1/5/2002	14.1
48103	10/21/2004	14.1
48103	12/24/2005	14.1
48103	4/3/2006	14.0
48103	4/7/2008	14.0
48103	2/12/2000	14.0
48103	12/18/1996	13.9
48103	2/7/2003	13.9
48103	1/17/1996	13.7
48103	2/11/1995	15.4
48103	10/28/2000	15.4
48103	7/20/2004	15.1
48103	5/18/2007	15.1
48103	3/5/2009	15.1
48103	3/23/2004	15.0
48103	6/27/2003	14.9
48103	11/6/2001	14.7
48103	10/15/2004	14.7
48103	11/24/2007	14.7
48103	2/26/2009	14.6
48103	1/23/2001	14.5
48103	10/29/2001	14.3
48103	2/21/2003	14.2
48103	6/5/2004	14.2
48103	2/21/2008	13.6
48103	3/29/1999	13.5
48103	4/30/2005	13.5
48103	2/7/2006	13.5
48103	2/16/2007	13.5
48103	10/26/1996	13.4
48103	9/12/1997	13.4
48103	6/11/1999	13.4
48103	12/23/2002	13.3
48103	10/29/2001	13.2
48103	2/18/2005	13.2
48103	2/11/1995	13.1
48103	2/5/1996	13.0
48103	4/27/2004	13.0
48103	3/3/2006	13.0
48103	7/25/2003	12.9
48103	1/17/2004	12.9
48103	10/30/2001	12.8
48103	1/18/2003	12.7
48103	2/6/2006	12.7
48103	3/2/2009	12.6
48103	9/13/2006	12.5
48103	4/17/1998	12.4
48103	10/22/2001	12.4
48103	11/9/2001	12.4
48103	2/16/1995	9.0
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	11/12/2009	9.0
48103	3/12/2005	8.9
48103	4/16/2004	8.9
48103	2/9/2007	8.9
48103	8/28/1999	8.9
48103	11/27/2009	12.4
48103	11/6/1995	12.2
48103	1/21/2003	11.1
48103	4/28/2001	11.1
48103	1/20/2003	11.0
48103	5/12/1999	10.2
48103	1/17/2002	10.1
48103	5/3/2004	10.1
48103	10/26/2004	10.1
48103	2/26/2004	10.1
48103	4/25/2006	10.1
48103	3/14/2006	10.1
48103	6/18/1999	10.1
48103	6/3/1995	10.0
48103	2/28/2003	10.0
48103	10/13/1998	8.0
48103	3/22/1996	12.0
48103	3/6/2009	12.0
48103	2/12/1999	11.9
48103	2/2/2009	11.9
48103	11/16/2006	10.9
48103	11/13/2002	10.8
48103	1/21/2003	10.8
48103	3/17/2008	10.8
48103	3/14/2000	10.8
48103	7/12/1997	10.7
48103	10/30/1997	10.7
48103	2/22/1999	10.7
48103	5/16/2009	10.0
48103	12/6/2001	9.9
48103	2/2/2007	9.9
48103	6/6/1994	8.9
48103	6/25/2009	8.9
48103	3/12/2003	8.8
48103	2/25/2006	8.8
48103	2/2/2007	8.8
48103	2/15/2000	8.8
48103	2/13/2006	11.8
48103	2/3/2006	11.8
48103	4/7/2008	11.8
48103	11/6/2001	11.7
48103	11/27/2004	11.7
48103	1/30/2006	11.7
48103	2/6/2009	11.7
48103	1/24/2005	11.6
48103	4/7/2003	10.7
48103	10/29/2001	10.7
48103	4/5/2004	10.6
48103	4/7/2006	10.6
48103	3/25/1999	10.5
48103	12/1/2009	9.8
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	7/23/2002	9.7
48103	7/21/2004	9.7
48103	4/3/2006	8.5
48103	2/20/2006	8.5
48103	3/30/2006	8.5
48103	4/10/2006	8.5
48103	9/24/2007	8.5
48103	1/21/2003	8.4
48103	11/5/2004	8.4
48103	2/27/2006	11.6
48103	11/16/2007	11.6
48103	10/29/2007	11.4
48103	6/18/1999	11.4
48103	7/24/2004	10.5
48103	11/16/2005	10.5
48103	6/5/2006	10.5
48103	2/21/2009	10.5
48103	3/30/2004	10.4
48103	2/27/2006	9.7
48103	2/7/2006	9.7
48103	1/6/2006	9.6
48103	10/2/2007	9.6
48103	2/27/2006	8.4
48103	5/1/2006	8.4
48103	4/4/2009	8.4
48103	2/22/1999	8.3
48103	3/30/2004	8.3
48103	5/15/2008	11.3
48103	3/15/1996	11.2
48103	2/16/2005	11.2
48103	2/27/2006	11.2
48103	2/13/2009	10.4
48103	8/30/2006	10.3
48103	10/10/2007	10.3
48103	11/28/1998	10.2
48103	3/21/2003	10.2
48103	12/1/2003	10.2
48103	5/5/1997	9.5
48103	2/11/2002	9.4
48103	2/28/2003	8.7
48103	6/18/2004	8.7
48103	12/22/2006	8.7
48103	9/13/2008	8.7
48103	11/29/1999	8.7
48103	12/9/2002	2.1
48103	1/12/2005	2.1
48103	3/7/2005	2.1
48103	3/11/2004	2.1
48103	4/16/2005	2.0
48103	11/4/2005	2.0
48103	9/6/2005	2.0
48103	4/28/2007	9.4
48103	4/4/2003	9.3
48103	8/13/1999	8.2
48103	2/2/2009	8.2
48103	4/17/2002	8.1
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	2/17/2006	8.1
48103	3/18/2005	2.1
48103	3/4/2006	2.1
48103	1/28/2006	2.1
48103	3/23/2006	2.0
48103	2/8/2006	2.0
48103	3/31/2006	2.0
48103	11/16/1995	9.2
48103	4/8/1997	9.2
48103	7/28/2004	9.2
48103	7/12/1997	9.1
48103	3/22/2008	8.3
48103	1/31/1995	8.3
48103	2/22/2003	8.2
48103	4/8/2002	8.2
48103	4/5/2004	8.2
48103	12/9/2004	8.2
48103	2/27/2006	8.2
48103	5/8/2006	8.2
48103	2/27/2006	2.1
48103	5/22/2009	2.1
48103	5/22/2006	2.0
48103	2/18/2000	9.1
48103	2/3/2009	9.1
48103	8/26/1995	9.0
48103	10/27/2001	9.0
48103	4/22/2002	9.0
48103	7/17/2006	9.0
48103	9/6/2005	8.6
48103	4/15/1999	8.6
48103	12/1/2000	8.6
48103	11/16/2009	8.6
48103	8/27/2001	8.5
48103	3/28/2008	2.1
48103	11/30/1994	2.1
48103	3/20/2008	2.0
48103	10/25/2002	21.6
48103	1/13/2003	20.9
48103	6/18/2001	30.6
48103	6/1/1998	20.2
48103	1/13/2003	20.0
48103	12/10/2002	19.6
48103	8/17/2009	2.1
48103	6/9/2009	2.1
48103	3/5/2009	2.1
48103	1/9/2009	2.0
48103	1/18/2002	28.6
48103	5/28/1994	26.7
48103	2/20/2009	19.2
48103	4/3/2009	19.1
48103	5/21/2003	18.7
48103	4/10/2006	18.7
48103	2/9/2009	18.7
48103	6/27/1995	1.6
48103	2/20/1999	1.6
48103	11/24/2003	1.6
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	10/27/2001	1.6
48103	12/6/2001	1.6
48103	1/17/2002	1.6
48103	1/30/2004	1.6
48103	5/28/2007	1.6
48103	6/5/2009	4.5
48103	2/6/2009	4.5
48103	2/21/2009	4.5
48103	3/6/2009	4.5
48103	2/2/2009	4.5
48103	10/20/1997	4.4
48103	7/21/2003	4.4
48103	2/22/2007	4.3
48103	2/2/2006	4.3
48103	2/10/2000	4.2
48103	2/11/2009	4.2
48103	2/14/2009	4.2
48103	2/21/2009	4.2
48103	3/20/2009	4.2
48103	5/30/2003	4.0
48103	2/7/2003	4.0
48103	8/28/2004	4.0
48103	1/28/2002	4.4
48103	2/15/2005	4.4
48103	4/12/2004	4.4
48103	11/7/2005	4.4
48103	5/7/2009	4.3
48103	9/24/2007	4.3
48103	3/2/1998	4.1
48103	10/25/2001	4.1
48103	12/5/2001	4.1
48103	11/3/2001	4.1
48103	6/1/2002	4.1
48103	2/7/2003	4.1
48103	2/13/2006	4.0
48103	3/6/2006	4.0
48103	5/7/2009	4.0
48103	7/6/2007	4.6
48103	5/22/2006	4.4
48103	1/28/2006	4.4
48103	2/14/2006	4.4
48103	7/20/2007	4.4
48103	1/28/2000	4.4
48103	1/11/2000	4.4
48103	1/24/2009	4.3
48103	3/16/2009	4.3
48103	11/24/2009	4.3
48103	4/30/2003	4.1
48103	2/20/2006	4.1
48103	12/16/2006	4.1
48103	6/22/2006	4.1
48103	1/18/2010	4.6
48103	2/21/2009	4.6
48103	2/17/2009	4.6
48103	5/14/1997	4.5
48103	4/6/1998	4.5
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	10/30/2001	4.5
48103	1/31/1994	4.4
48103	3/27/2009	4.4
48103	3/25/2009	4.4
48103	8/25/2003	4.2
48103	10/30/2002	4.2
48103	12/13/2002	4.2
48103	3/14/2003	4.2
48103	3/28/2003	4.2
48103	5/8/2006	4.2
48103	1/26/2006	4.1
48103	2/13/2006	4.1
48103	5/14/2009	4.1
48103	3/9/2007	4.1
48103	3/31/2008	4.1
48103	11/8/2001	4.5
48103	2/6/2007	4.5
48103	4/22/2006	4.5
48103	1/28/2006	4.5
48103	3/13/2006	4.5
48103	11/6/2006	4.5
48103	7/16/2002	4.3
48103	1/17/2002	4.3
48103	10/27/2001	4.3
48103	2/21/2006	4.2
48103	2/13/2006	4.2
48103	7/27/2001	4.1
48103	2/7/2009	4.1
48103	2/6/2009	4.1
48103	5/5/1997	4.0
48103	4/18/1997	4.0
48103	2/8/2006	4.5
48103	4/4/2000	4.5
48103	4/16/2009	1.6
48103	2/17/2009	1.6
48103	3/18/1999	1.5
48103	9/11/1995	1.5
48103	7/5/1995	1.5
48103	2/3/2007	1.6
48103	11/7/2005	1.6
48103	2/15/2007	1.6
48103	4/10/2006	1.6
48103	4/10/2006	1.6
48103	4/24/2006	1.6
48103	6/3/2006	1.6
48103	2/4/2006	1.6
48103	3/2/2007	1.6
48103	8/18/2007	1.6
48103	4/8/2008	1.6
48103	8/9/1999	1.6
48103	3/6/2009	1.6
48103	8/17/2009	1.6
48103	2/16/2007	1.5
48103	10/7/2006	1.5
48103	7/17/2006	1.5
48103	7/11/2008	1.5
48103		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

	6/13/2001	1.5
48103	3/6/2002	1.5
48103	11/6/2001	1.5
48103	5/21/2005	1.5
48103	3/2/2005	1.5
48103	3/26/2003	1.4
48103	2/28/2004	1.4
48103	2/13/2006	1.4
48103	4/18/2009	1.5
48103	4/25/2009	1.5
48103	5/9/2009	1.5
48103	2/5/2009	1.5
48103	2/5/2009	1.5
48103	3/25/1997	1.4
48103	10/30/1995	1.4
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48103	4/14/1997	1.4
48103	2/16/1999	1.4
48103	11/29/2007	1.4
48103	5/12/1999	1.4
48103	1/22/2010	1.4
48103	1/19/2010	1.4
48103	6/2/2006	1.4
48103	2/2/2007	1.4
48103	5/5/2007	1.4
48103	2/9/2006	1.4
48103	2/4/2006	1.4
48103	4/17/2006	1.4
48103	5/20/2008	1.4
48103	4/5/2008	1.4

Federal EPA Radon Zone for WASHTENAW County: 1

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 48103

Number of sites tested: 25

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	Not Reported	Not Reported	Not Reported	Not Reported
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	4.768 pCi/L	72%	24%	4%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory
Source: Department of Natural Resources
Telephone: 517-241-2254

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Data
Source: Department of Environmental Quality
Telephone: 517-335-9218
The data in this file was obtained from Wellogic, the Michigan Department of Environmental Quality Statewide Groundwater Database (SGWD). Wellogic contains approximately 425,000 water well records found within the State of Michigan, and although it represents the best available data, it cannot be considered a complete database of all the wells or well records in existence.

OTHER STATE DATABASE INFORMATION

Michigan Oil and Gas Wells
Source: Department of Environmental Quality
Locations of oil and gas wells are compiled from permit records on file at the Geological Survey Division (GSD), Michigan Department of Natural Resources.

RADON

State Database: MI Radon
Source: Department of Environmental Quality
Telephone: 517-335-9551
Radon Test Results

Michigan Radon Test Results
Source: Department of Environmental Quality
Telephone: 517-335-8037
These results are from test kits distributed by the local health departments and used by Michigan residents. There is no way of knowing whether the devices were used properly, whether there are duplicates (or repeat verification) test (i.e., more than one sample per home), etc.

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

STREET AND ADDRESS INFORMATION

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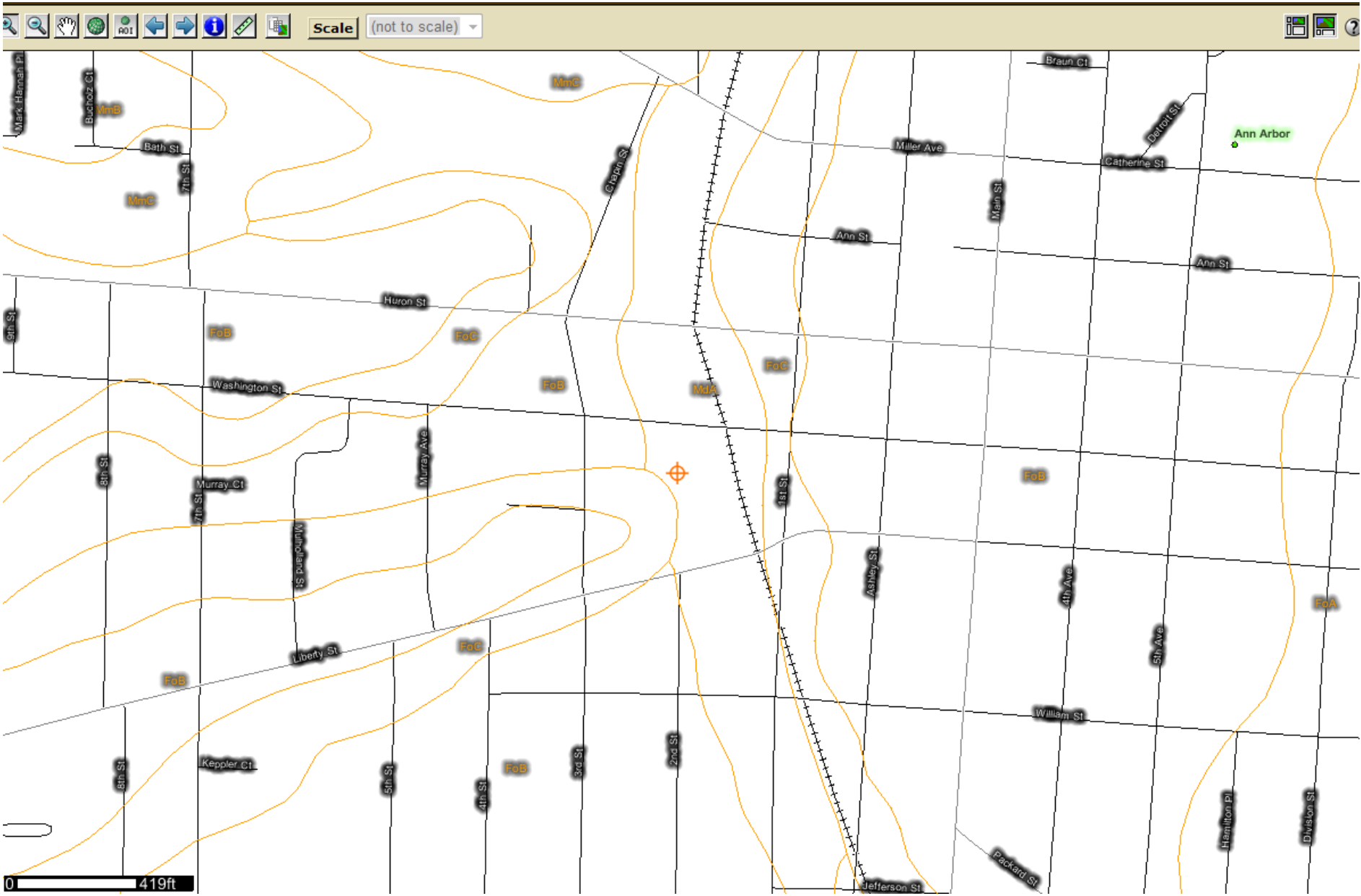
APPENDIX I

SOIL MAP



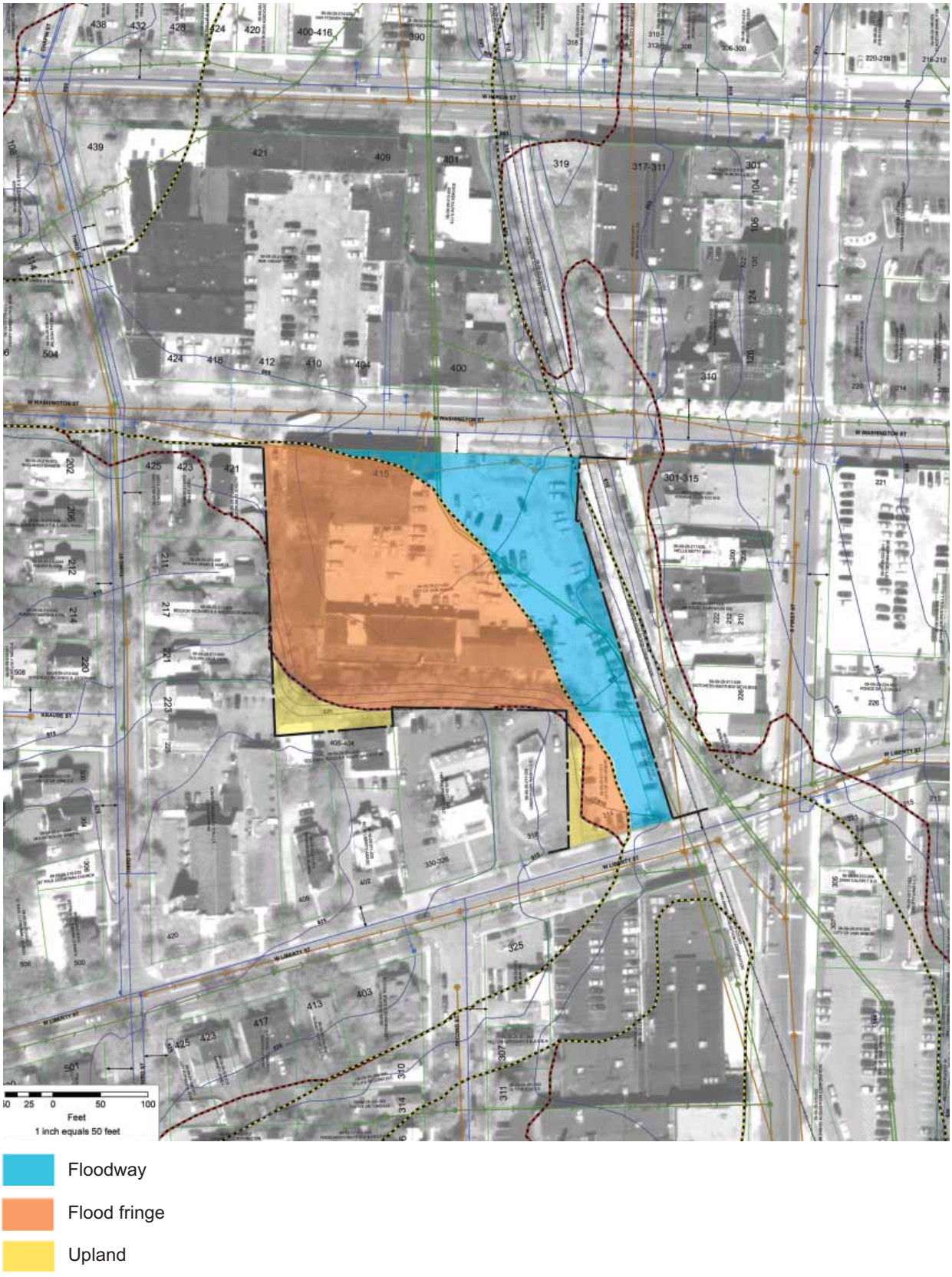
MdA – Matherton Sandy Loam; 0-4% slope
FoB – Fox Sandy Loam; 2-6% slope
FoC – Fox Sandy Loam; 6-12% slope

APPENDIX J

FLOOD PLAIN MAP

(FROM ALLEN CREEK TASK FORCE DOCUMENT)

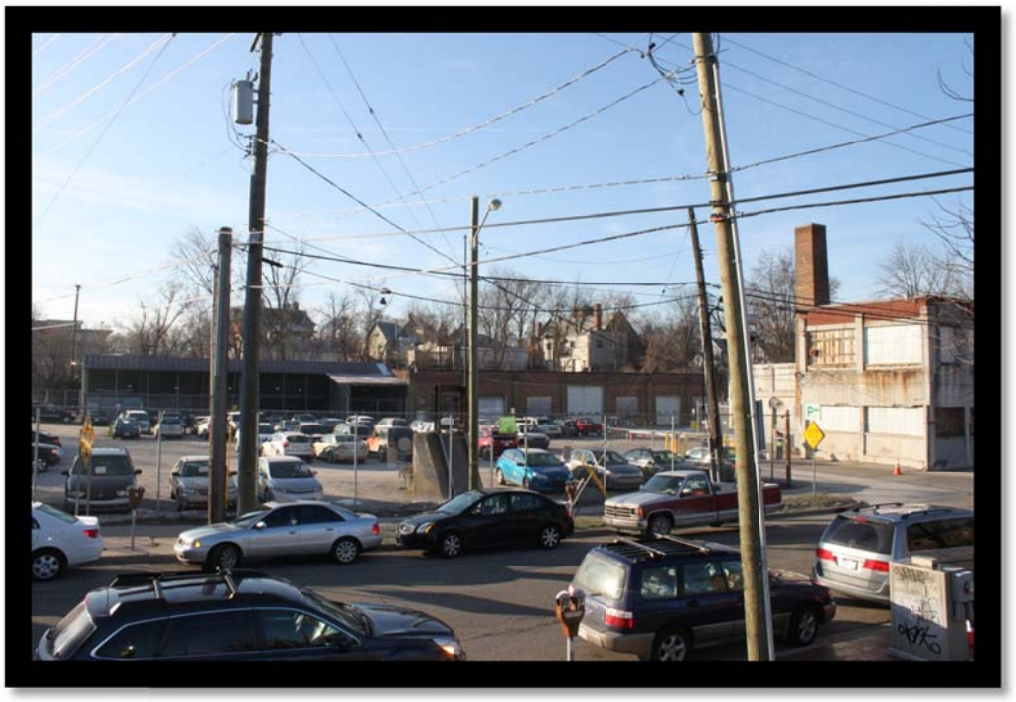
Surface Hydrology on the 415 W. Washington Site



APPENDIX K

PHOTOGRAPHS

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan



Looking southwest at the subject property

Looking southwest at the North Garage

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Looking southwest at the West Garage

Looking south at the South Garage

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Looking south towards Liberty along the east side of the subject property

Looking south towards Liberty at the adjacent property

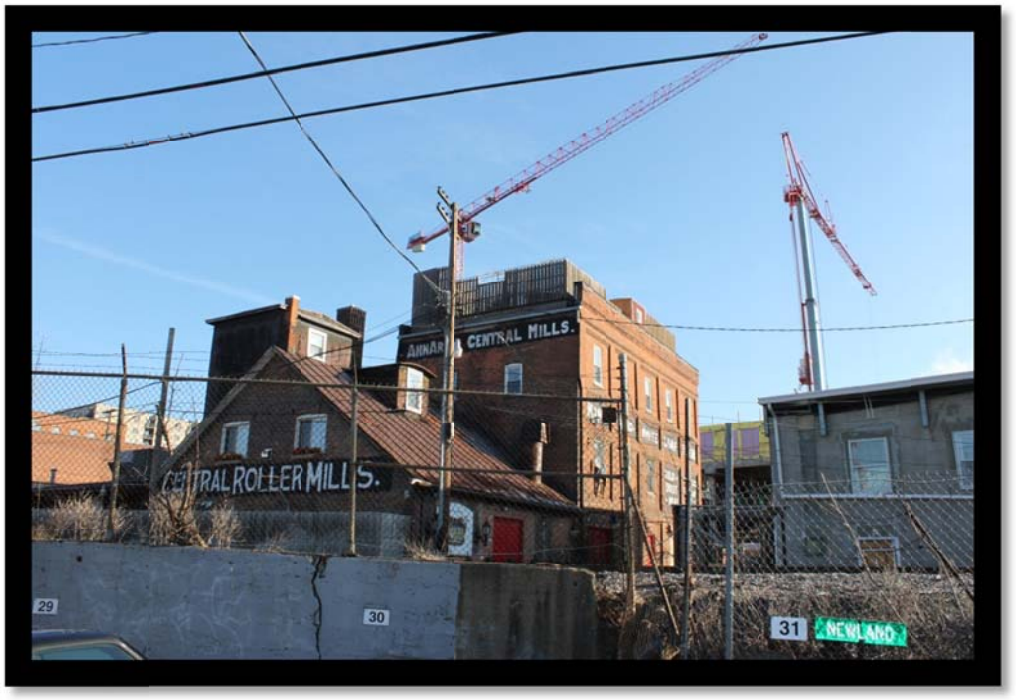
Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Looking west down Liberty Street

Looking west from the southern end of the subject property at the adjacent property

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Looking east down Liberty at the AARR and the adjacent properties



Looking east at the adjacent properties

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Looking north inside the North Garage

Trenches and drains located downstairs in the North Garage

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Looking east at the inside of the North Garage

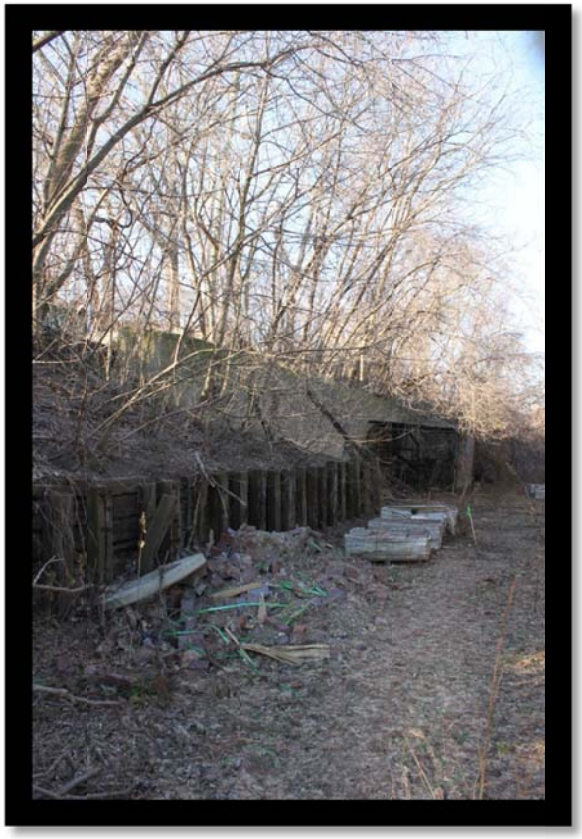
Looking west at the former “radio repair” area of the West Garage

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Looking south at the former “lawn mower repair” area of the West Garage

Looking west at the former carpentry shop inside the West Garage

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan



Looking west at the area behind the South Garage

Inside the storage area of the South Garage

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Portable diesel tank located in the South Garage

Pallets of bagged salt and a skidsteer inside the South Garage

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Equipment stored inside the South Garage

Drums of “compound cleaning liquid” in the South Garage

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Miscellaneous drums and buckets located inside the South Garage

Miscellaneous buckets of epoxy, primer, and floor coating inside the South Garage

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

55-gallon drum of xylene inside the South Garage

Absorbent material covering a spill in the South Garage

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Five gallon buckets of hydraulic fluid located in the southwest corner of the South Garage

Stained concrete near miscellaneous buckets in the South Garage

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Potential asbestos covered pipes located inside the North Garage

Unmarked full 55-gallon drums located in the South Garage

Appendix K
Phase I ESA Photographs
415 W. Washington Street
Ann Arbor, Michigan

Potential asbestos containing tiles located in the offices above the North Garage

Looking west at West Garage, monitoring wells, piezometers, and manholes associated with the remediation system (right)

APPENDIX L

QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONAL

TETRA TECH

Patti J. McCall
Senior Geologist

Senior Geologist with work experience as senior project manager, project geologist, and senior scientist. As a Senior Geologist, Ms. McCall has managed site characterization, remediation, hydrogeological, wetland and landfill projects, and ecological risk assessments, regulatory compliance investigations, Michigan Department of Environmental Quality (MDEQ) Part 201 and 213 investigations, Phase I and Phase II environmental site assessments (ESAs), and proposal preparation.

Additional responsibilities include, but are not limited to; underground storage tank compliance activities; implementing landfill monitoring projects, groundwater sampling and methane monitoring, wetland delineations and mitigation monitoring, project budgeting and tracking. Ms. McCall has completed and certified USEPA Greenhouse gas reporting for municipal landfills and prepared remedial investigations, hydrogeological investigations, initial and final assessment reports, work plans, closure reports, remedial action plans, statistical analysis, wetland delineation reports, wetland mitigation monitoring reports and Joint Permit Application preparation. She has supervised ongoing remediation projects, Phase I and II ESA's, ground water monitoring, and report presentation.

EXPERIENCE

Key Landfill Experience

Municipal Waste Landfill, Ann Arbor, Michigan – Senior Geologist and Project Manager responsible for overseeing the completion of groundwater, wastewater and gas sampling events on a quarterly basis, methane collection system operations, database management and evaluation, wastewater discharge mass balance calculations, maintenance repairs and subcontractor coordination budget tracking and task management. Ms. McCall is also responsible for coordinating with and attending meetings when necessary with the MDEQ and attending monthly project meetings with City of Ann Arbor personnel.

Other activities completed during the contract period include a leachate outbreak investigation and landfill cap repair work plan preparation, installation and final report; an historical review and completion of a report to document proper closure of Phase I, assistance with and final preparation of the offsite remedial action plan, completion of the United States Environmental Protection Agency (USEPA) greenhouse gas mandatory reporting requirements, completion of the Industrial User Permit (IUP) renewal application, optimization of the north side methane collection system including the addition of a telemetry system, a bioremediation pilot test and a successful revision to the gas monitoring plan, significantly reducing the sampling plan requirements.

Education:

B.S., Geology, Indiana University Northwest, Gary, Indiana, 1999

B.S., Public Policy, Indiana University, Bloomington, Indiana, 1993

Professional Affiliations:

American Institute of Professional Geologists

Geological Society of America

Huron River Watershed Council

Michigan Association of Environmental Professionals

University of Michigan Matthaei Botanical Gardens and Nichols Arboretum

Sigma Xi

Registrations/ Certifications:

40-hour HAZWOPER, Compliance Solutions 2002 Southfield, Michigan with annual 8-hour refreshers from 2003 to present.

Adult First Aid, CPR and AED certified 2007 by American Red Cross with annual refreshers from 2008 to present.

FRA 214 Railroad Workplace Safety On-Track Safety Canadian National Railway 2011 to present

TransCanada Health, Safety and Environment Training 2012

Office:

Ann Arbor, Michigan

Years of Experience:

Eleven

Years with Tetra Tech

Six

As a senior scientist at a previous firm, Ms. McCall was responsible for completing field sampling activities, environmental reporting, completing a groundwater discharge investigation and coordinating the 1,4-dioxane onsite treatment pilot test.

Capture Zone Analysis at Municipal Landfill, Ann Arbor, Michigan – Project manager and geologist on a team of scientists and engineers, who successfully updated the site conceptual model and completed a capture zone analysis of the existing extraction well configuration. Activities included updating the geological interpretation, installing observation wells and completing an aquifer analysis and numerical groundwater model. The results provided a significant cost savings to the city of Ann Arbor by allowing one extraction well to be turned off. A modification to the IUP was completed and approved by the City of Ann Arbor to reduce the sampling requirements of the extraction well.

Previous firm

Private Type II Landfill, Birch Run, Michigan – Senior scientist responsible for overseeing the completion of groundwater, gas and primary and secondary leachate sampling events on a quarterly basis, database management and evaluation, secondary leachate discharge volume calculations, maintenance repairs and subcontractor coordination, annual MDEQ inspections, budgeting and task management and coordination with the MDEQ project manager, site supervisor and client.

Numerous Type II Landfills, Lower Michigan – Senior scientist responsible for statistical evaluations and tolerance limit calculations both site wide and intra well; assistance with completion of groundwater, gas and leachate sampling on a quarterly basis, database management and evaluation, budgeting and task management on numerous type II landfills.

Key Environmental Site Characterization, Remediation and Property Transfer Project Experience

Canadian National Railway, Detroit, Michigan – Senior Geologist responsible for reviewing FOIA documents and data from previous consultants, creating Areas of Concern, developing a sampling strategy and implementing a phased approach to delineating soil and groundwater impacts. Additional tasks include identifying current underground infrastructure as possible sources of LNAPL conveyance using ground penetrating radar (GPR) and electromagnetic locating equipment, completing a statistical background metals analysis, completing test pits, removing oil from site catch basins and attending regular meetings with the client for progress updates. A focused feasibility study is being prepared to provide remediation and closure plans for a variety of land use options.

721 N. Main Street, Ann Arbor, Michigan – Senior Geologist responsible for completing a Phase I ESA for the City of Ann Arbor's former Fleet Facility and Maintenance Garage. The completion of the Phase I required input from numerous City of Ann Arbor employees and coordination between SmithGroupJJR, Tetra Tech and City of Ann Arbor personnel.

Millers Creek Sediment Assessment, Ann Arbor, Michigan – Senior Geologist responsible for developing a sampling plan for characterizing the removal of approximately 1,000 cubic yards of sediment from a creek. A significant cost savings was realized by sampling the creek for all potentially necessary parameters to be placed on hold with the laboratory, while sieve analyses were completed. Results of the sieve analysis indicated a sufficient percentage of sand grains to preclude quality analysis of the sediment for contaminants. However one sample was

analyzed for select parameters to complete waste profiling, should City personnel chose to dispose of the sediment at a landfill.

Municipal Waste Landfill, Ann Arbor, Michigan – Senior Geologist responsible for overseeing the completion of a bioremediation pilot test on a vinyl chloride plume. Responsibilities included coordination with state, county and city officials for permits and concurrence on injection of an emulsified vegetable oil remediation product. The pilot test required the installation of seven injections wells and an observation well to approximately 20 feet. A manifold system was used to inject EOS from 55 gallon drums followed by a water flush using the city's hydrant. Additional sampling required by MDEQ included secondary metal releases and methane generation. Follow-up sampling to determine the success of the pilot test has demonstrated complete dechlorination of vinyl chloride to ethene and significant mass removal.

Automotive Manufacturing Facility, Confidential Client, Michigan – Senior Geologist responsible for planning and completing an investigation into leaking oil lines from presses at an active manufacturing facility. The investigation included vacuuming out a previously abandoned underground oil line and connecting sump locations, installing a mobile camera to determine the integrity of the pipe/sumps and presence of oil, pushing water through the line to determine which presses were connected to the previously abandoned pipeline system, finding connections and capping known locations, investigating the trench system of all presses and finally filling the abandoned line with flowable fill.

Automotive Manufacturing Facility, Confidential Client, Michigan – Senior Geologist responsible for planning and completing chemical oxidation injections as corrective action on a Resource Conservation and Recovery Act (RCRA) site to remediate heavy metals (chiefly hexavalent chromium and nickel) from the groundwater. The site is successfully being remediated through interim actions, removing the need to implement large-scale infrastructure that would be necessary for a pump and treat system, originally planned for the corrective measure. Completing chemical oxidation has created a cost savings for the client while attaining cleanup objectives in a shorter timeframe. Due to site and time constraints and the active nature of the facility, the work has required a great deal of coordination between parties and production schedules.

Automotive Manufacturing Facility, Confidential Client, Michigan – Senior Project Geologist responsible for completing closure activities for six RCRA Solid Waste Management Units (SWMUs) including the excavation of three former sludge settling lagoons and a process underground storage tank. Verification of soil remediation and groundwater samples were collected in accordance with *MDEQ Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria* and a closure report has been submitted for four of the six SWMU's.

The remaining two SWMUs include a wastewater treatment plant (WWTP) that formerly conveyed electroplating waste and an oil/water decanting farm located adjacent to the WWTP. Selective demolition was completed on the WWTP to remove all piping, chemical tanks and sumps, including electrical conduit related to the former process. Restoration activities included the addition of a concrete drive for tanker trucks and a garage door and driveway for facility access. A natural gas line was installed to bring heat to the WWTP from the powerhouse.

During the demolition, a drilling investigation was completed under the former oil/water decanting farm that identified hydraulic oil impacts in the soil. An excavation was completed to remove the soils above the thin native clay unit protecting the perched aquifer. A bioremediation product, Micro-Blaze^{R} was applied to the native clay to

enhance biological degradation of the oil. Site characterization was completed to delineate the extent of the impact under the existing containment area and WWTP. Passive recovery and monthly free product checks are being completed while remedial options are being investigated.

Automotive Manufacturing Facility, Confidential Client, Michigan – Senior Geologist responsible for completing closure activities for a RCRA SWMU that was a former construction debris landfill. Activities included excavation, wetland delineating and permitting, concrete roadway replacement, backfill and seeding and planting restoration activities. The landfill contained concentrations of trichloroethene and daughter products above applicable criteria that migrated from the capped landfill, down a slope and into a wetland that serves as the groundwater surface water interface compliance point. Excavation has occurred in three phases. The first phase required steel shoring to maintain structural integrity of a retaining wall and concrete roadway replacement in winter. The second phase required excavation along a slope to depths greater than 25 feet into clay. The third phase of excavation was within a wetland and required coordination with MDEQ state wetland regulators and submittal and approval of a JPA. Verification of soil remediation and groundwater samples were collected in accordance with *MDEQ Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria*. Wetland restoration included backfilling with primarily clay to maintain the perched nature of the wetland and grading to pre-excavation elevations. The area was planted with an emergent wetland seed mix and a dozen wetland shrubs were planted in the spring of 2012. An Interim Measures Implementation Report has been submitted to MDEQ.

Automotive Manufacturing Facility, Confidential Client, Michigan – Senior Project Geologist responsible for completing the excavation of PCB-containing sediment from an outfall discharge to a wetland. The project included delineating the wetland, completing and obtaining a permit from the MDEQ for excavation and dewatering activities within the wetland, engineering two new outfall structures with oil water separators, and restoring the wetland. Verification of soil remediation and groundwater samples were collected in accordance with *MDEQ Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria* and a closure report was submitted.

East Stadium Boulevard Bridge Project, Ann Arbor, Michigan – Senior Geologist responsible for designing and implementing a soil characterization sampling plan prior to replacement of the East Stadium Boulevard Bridge and associated and nearby utility infrastructure. Responsibilities included reviewing nearby facility data, developing a sampling plan for infrastructure routes along the boulevard and the six earthen walls surrounding the bridge, conducting a site meeting for private, city and University of Michigan utilities prior to subsurface work, implementing a hand auger and direct push drilling plan, completing a statistical analysis of soil concentrations above applicable criteria, and preparing a letter report of findings and recommendations. The age of the fill material used to build the earthen walls surrounding the bridge and the past industrial uses in the area required an extensive sampling plan. Additional area information and statistical analysis were used to reduce the sampling parameters and coordination with local landfill operations prior to sampling implementation helped to reduce the overall number of samples required. Other responsibilities included preparing a Due Care Plan, estimating dewatering volumes, completing groundwater sampling and assisting with groundwater to surface water discharge needs.

Various Projects, Ann Arbor, Michigan – Senior Geologist responsible for additional 'on-call' environmental projects as needed. During the contract period 2007 to 2012, the City of Ann Arbor personnel have required environmental assistance with a variety of projects including: sampling and removal of a found underground storage tank during utility installation; sampling and site characterization assistance during utility installation for

petroleum impacted groundwater; sampling and site characterization assistance during utility installation for suspected petroleum impacted soils; sampling and determining safety protocols for handling slag; sampling and completing a waste profile for railroad embankment soils; developing and implementing a soils sampling plan and coordinating with University of Michigan for impacts within the City-owned road right of way; sampling and site characterization assistance during water main replacement and road improvements for suspected petroleum impacted soils; soil sampling and site characterization for soil/debris pile removal during a water main installation project in an area park; and groundwater sampling and site characterization for an embankment improvement area near a railroad for suspected water contaminants.

During the contract period beginning in 2012, the City of Ann Arbor personnel have required environmental assistance with an additional number of projects including: sampling, field assistance with delineating impacts and completion of a waste profile for petroleum impacted soils encountered during utility installation; surface water sampling and completion of a waste profile for railroad embankment soils; and sampling and characterization assistance with leaf sampling to determine if street swept leaves could be used for composting.

Pall Life Sciences 1,4-dioxane plume, Ann Arbor, Michigan – Senior Project Geologist responsible for oversight, budget tracking and client coordination for a third party review completed by Doug Sutton, Principal Engineer of GeoTrans, Inc. (former name of Tetra Tech GEO). The site conceptual model completed for the Evergreen Area of the Pall Life Sciences (PLS) 1,4-dioxane contaminant plume by PLS's consultant Fishbeck, Thompson, Carr & Huber, Inc (ftc&h) and MACTEC Engineering and Consulting was reviewed by Mr. Sutton Ms. McCall and Mr. Sutton attended a meeting with PLS, ftc&h, MACTEC, City of Ann Arbor and Washtenaw County personnel to review ftc&h/MACTEC findings, Mr. Sutton's findings and provide recommendations for additional data needs moving forward. A summary letter of the meetings key findings was produced by Ms. McCall and Mr. Sutton for the City of Ann Arbor.

Previous firm

Sunoco Gas Station, Luna Pier, Michigan – Senior Scientist responsible for emergency response to a diesel fuel spill from a gas station to Lake Erie. The project required coordination with United States Coast Guard, USEPA Region V, numerous MDEQ divisions, City of Luna Pier officials and the gas station owner (client). Ms. McCall provided direction and completed oversight of field activities including investigation of the diesel fuel leak from pumps, through utilities to the wastewater treatment pump station and finally to Lake Erie. This included completing excavation, numerous infrastructure repairs and replacements; drilling activities to delineate free product; continuous vacuum pumping to maintain further releases offsite, jet-cleaning utilities to the Lake; installing a recovery trench and recovery wells and installing a mobile SVE system. Twice daily meetings were coordinated and lead by Ms. McCall to facilitate the cleanup with field personnel, subcontractors, USEPA's Superfund Technical Assessment & Response Team (START) contractor, regulatory personnel (state and federal) and City officials and wastewater treatment operators. When the client was unable to meet financial obligations, the USEPA exerted jurisdiction over the site and requested Ms. McCall's return to complete additional subsurface investigational work and data analysis.

Former Manufacturing Facility, Confidential Client, Michigan – Senior Scientist responsible for developing a sampling plan and implementing a Phase II site investigation for a former foam and plastic manufacturing facility that previously supported the automotive industry. The initial Phase II investigation included gathering soil and

groundwater data through temporary monitoring wells. Following the initial Phase II investigation and data evaluation, a second mobilization to delineate impacts was completed. The data was evaluated and recommendations were made for impacted areas. A BEA was completed to assist with the sale of the property and submitted to the MDEQ.

Retail Petroleum Market, Multiple Site Divestiture, Confidential Client, Southeast Michigan – Senior Scientist on a team responsible for completing a fast-track, real estate divestiture assessment of 26 locations in the metropolitan Detroit area. Each site assessment was completed within four weeks and all 26 sites were completed in a three month timeframe, requiring management of multiple sites per team member. Each site assessment included placement and installation of an average of six soil borings and groundwater monitoring wells, soil sample and groundwater collection, data evaluation and site divestment assessment reporting. Site work was completed in accordance with the client specific health and safety requirements, which required project personnel to attend two 8-hour training sessions. The client's compressed schedule and project goals were achieved and all work was completed without a health and safety incident.

Commercial Petroleum Multiple Phase I Environmental Site Assessments (ESAs), Confidential Client, Southeast Michigan – Senior Scientist on a team responsible for completing Phase I ESAs at 13 locations in the metropolitan Detroit area within a 30-day timeframe in accordance with the ASTM standard. In addition to specific site reporting tasks, Ms. McCall was responsible for completing a technical review of the 13 client-specific formatted Phase I ESA reports. Two levels of client review were completed prior to the report finalization. The client's compressed schedule and project goals were achieved.

Former Manufacturing Facility, Oceana County, Michigan – Senior Scientist responsible for completing a Phase II site investigation, BEA and Due Care Plan at a former manufacturing facility. The property was classified as a leaking underground storage tank (LUST) site, which was known by the client prior to purchase. A Category N BEA was completed on behalf of the purchaser to obtain liability protection for the existing contamination resulting from the LUST. A Due Care Plan was also developed and included with the BEA submittal.

Clawson Concrete (Edw. C. Levy Property), Detroit, Michigan – Senior Scientist responsible for planning and implementing scopes of work, coordinating with the client, and completing field activities including site and off-site characterization, notice of migration drafting, well installations, free product recovery, monthly free product checks; Part 213 semi-annual progress reports; excavation planning and implementation, Final Assessment Report update and site closure activities. The site was granted closure with no further action required by MDEQ.

Former Retail Gas Station, Romulus, Michigan – Senior Scientist responsible for completion of site characterization, soil and groundwater sampling, completion of a feasibility analysis of remedial options, and development and implementation of corrective actions including excavation oversight, dewatering activities and installation of an oxygen releasing compound (ORC) to complete bioremediation in the utility corridor where excavation was not feasible. A final report documenting site activities was submitted to the MDEQ. The project was completed for the State of Michigan through a Level-of-Effort (LOE) state contractor (MACTEC) project management program. A bid package was drafted and selection of trade contractors for the remedial activities was completed in accordance with MDEQ requirements for the LOE contract.

Automotive Supplier Manufacturing Facility, Confidential Client, Rochester, Michigan – Senior Scientist responsible for planning and implementing the closure-in-place of three unregulated underground storage tanks (USTs) located beneath the active facility's interior floor. Soil sampling was completed around the USTs in accordance with *MDEQ Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria* guidance. The facility maintained full production while the USTs were located, the concrete floor and steel tanks were accessed, the airspace inside the USTs were rendered inert and the USTs were cleaned before filling with concrete. To complete the project safely within the schedule and budget, continual coordination and communication was required with plant personnel as well as innovative and evolving planning and implementation to ensure the facility's production schedule was not impacted.

Part 213 Investigations, Numerous Clients Michigan - Completion of MDEQ Part 213 Leaking Underground Storage Tank Closure reports for sites with reported petroleum releases. Tasks completed included preparation of Interim Action Reports (IARs); supervision of UST removal activities; collection of verification of soil remediation samples; quarterly groundwater monitoring events and data evaluation, monthly free product events, system operation and maintenance, development of corrective action plans, preparation of MDEQ Part 213 Site Assessment, and preparation of Final Assessment Reports (FAR) for Tier I and II sites.

Phase I and II Environmental Site Assessments (ESA) - Numerous Clients, Michigan – Completion of Phase I and Phase II ESAs for residential, commercial and industrial clients within Southeast Michigan using ASTM standards and All Appropriate Inquiry (AAI) for site assessments. Additional scope of work for Phase I ESAs included wetland delineations where appropriate.

Key Wetland Experience

Municipal Project, Genoa Oceoloa Township, Michigan – Senior project geologist responsible for coordination and completion of formal wetland delineation and stream identification activities along 1.5+/- miles of a proposed sanitary sewer installation along Latson Road to connect two existing pump stations. The project was required to alleviate capacity issues along Grand River Avenue. In addition, Michigan Department of Transportation (MDOT) has a scheduled improvement project at the Latson Road interchange that would have required the relocation of the existing force main prior to the MDOT schedule. A JPA was submitted for the regulated wetland and stream crossings to meet the schedule.

Canadian National Railway, Michigan – Senior Geologist on a team of scientists responsible for providing a GIS platform of CN's railways through Michigan's natural resources. The database will provide end users the ability to determine potential locations that require permitting or where mitigation banks are available in various watersheds. Layers include National Wetland Inventory (NWI) Cowardin types, National Wild and Scenic Rivers, Soil Survey Geographic Database (SSURGO) maps; State of Michigan mapped wetlands, Watershed boundaries, topography, Wetland mitigation banks and the CN Railway throughout Michigan marked with mileposts. The current work is expected to expand to surrounding states where CN has rail lines.

TransCanada, Ottawa and Kent Counties, Michigan – Senior Geologist on a team of scientists and engineers assisting with a 16.5-mile corridor wetland delineation and construction activities for removal and abandonment of a natural gas pipeline in Kent and Ottawa Counties. The project included evaluating workspaces to minimize wetland impacts, coordinating with USACE and MDEQ for qualifying permit exemptions and facilitating both cultural and threatened and endangered species surveys to satisfy Federal Energy Regulatory Commission (FERC) requirements. A wetland delineation report was submitted to the MDEQ Wetland Identification Program and an onsite meeting was held with the MDEQ wetland regulator. A pre-application meeting was held onsite to review changes in the project scope and determine the necessity of a JPA for stream impacts. The activities were exempt from the wetland permitting process.

Energy Sector, Confidential Client, Michigan – Senior geologist working with a team of scientists and engineers, responsible for assisting in alternative analysis and new construction building envelope options resulting in the least amount of wetland disturbance in conjunction with logistical, economic, environmental and project goals. Additional responsibilities included assistance with watershed analysis, planning and drafting a conceptual mitigation document, meetings with regulatory agencies, producing a Request for Additional Information document to the Combined Operating Licensing Application for submittal to the United States Army Corps of Engineers (USACE) and completing a Joint Permit Application for MDEQ and USACE submittal. The JPA was approved by MDEQ in January 2012.

In accordance with the JPA process and to receive approval for a draft permit, mitigation was required for wetland impacts. An offsite parcel was necessary to achieve the mitigation acreage. After locating a suitable parcel, Ms. McCall was responsible for overseeing completion of a wetland delineation on a 210-acre agricultural field and regulatory concurrence using the state's Wetland Identification Program that included an onsite review by representatives from the MDEQ and USACE. Additional responsibilities included completion of geotechnical borings, direct push drilling and installation of piezometers, transducer installation, 12 weeks of water level gauging, stream gauging and transducer data download. Data was evaluated and a report of findings was completed for use in determining the site's water budget for mitigation planning.

Automotive Manufacturing Facility, Confidential Client, Michigan – Senior project geologist responsible for coordination and completion of a formal wetland delineation and oversight and assistance of an approved screening level ecological risk assessment (SLERA) on the undeveloped portion of a 180-acre industrial property. Activities for the SLERA included sediment sampling with a mini-ponar, soil and surface water collection, database management, statistical analysis, reporting and coordination with both the state of Michigan and the USEPA Region V. A modified Baseline ERA Sampling Plan was submitted and approved by the state of Michigan. Soil and specimens were collected and tissue sampling and analysis were completed. A bioaccumulation study, statistical analysis and final modified BERA were submitted and approved by USEPA and the MDEQ.

Municipal Project, Genesee County, Michigan – Senior project geologist responsible for coordination and completion of formal wetland delineation and stream identification activities along 5.5+/- miles of a proposed sanitary sewer alignment and completion of a Phase I ESA along the proposed corridor. Responsibilities also include alignment location and construction method recommendations for the project engineer in order to eliminate or minimize potential wetland or stream impacts; coordination with the state regulatory authority, attendance at a pre-application meeting with the state wetland regulator and completion of a JPA for the regulated wetland impacts. A permit was granted by MDEQ in April 2012.

Golf Course Redevelopment, Ottawa Lake, Michigan – Senior project geologist responsible for completion of a wetland delineation and regulatory assessment within the state of Michigan's Wetland Protection Law. Four ponds on the property were proposed for either expansion or fill and a wetland connected to a county drain were identified. Attendance at an onsite pre-application meeting with MDEQ personnel and changes in development planning resulted in a letter report to the state in lieu of a Joint Permit Application providing the client significant cost and time savings.

Various Municipal and Commercial Projects, Southeast Michigan and Northwest Ohio – Senior project geologist responsible for coordination and completion of formal wetland delineations and assessment activities prior to construction activities. These delineations and assessments were necessary for determining building envelopes, construction and planning activities and regulatory requirements for both municipal and commercial developments ranging from bridge improvement and utility infrastructure improvements to golf course improvements.

Previous firm

Various Residential and Commercial Developments, Southeast Michigan – Senior scientist responsible for coordination and completion of formal wetland delineations throughout Livingston, Wayne, Ingham, Genesee, Oakland and St. Clair Counties in southeast Michigan. These delineations were required for both residential and commercial developments with properties ranging in size from less than an acre to greater than 100-acres. The majority of these delineations were reviewed and approved by the MDEQ as accurate.

Municipal Project, Sanilac County, Michigan – Senior scientist responsible for coordination and completion of formal wetland delineation and stream identification activities along 26+/- miles of a proposed water main alignment. Responsibilities also included alignment location and construction method recommendations for the project engineer in order to eliminate or minimize all potential wetland or stream impacts. The project was completed in two months; impacts were minimized to meet the MDEQ's general permit requirements and resulted in receipt of a permit within 30 days of submittal. The project fast-track was required to meet significant funding timelines.

Residential/Commercial Traditional Neighborhood Development, Howell and Fowlerville, Michigan – Senior scientist responsible for coordinating and completing annual wetland mitigation monitoring activities. Wetland mitigation included the creation of 1.41-acres of emergent wetland in addition to riffle and pool and meander stream construction along 800-feet of county drain. Monitoring activities included sampling along seven transects; data collection within 38 sample plots along the established transect lines; data analysis using the Floristic Quality Assessment; and statistical analysis to determine plant dominance, degree of wetness and diversity.

Lake Dredge, Brooklyn, Michigan – Senior scientist responsible for coordination with and attendance at an MDEQ pre-application meeting to determine application needs and the MDEQ's concerns related to proposed lake dredging required for adequate boat access. Prior to the application process, access to open water of the lakefront property was dominated by aquatic bed wetland at shallow depths. Dredging of the aquatic bed was proposed. Responsibilities in addition to the MDEQ coordination, included preparation of an MDEQ permit application detailing the project needs, alternatives analysis and design parameters.

Residential Development, Fenton Township, Michigan – Senior scientist responsible for coordinating and completing annual wetland mitigation monitoring activities. Wetland mitigation included the creation of 1.33-acres of emergent wetland at four separate locations within the development. Monitoring activities include qualitative sampling and data analysis using the Floristic Quality Assessment; and statistical analysis to determine plant dominance, degree of wetness and diversity within the four mitigation areas.

Residential Development, Burtchville Township, Michigan – Senior scientist responsible for completion of a formal wetland delineation required for resolution with the MDEQ and future sale of lots for residential development. Project specifics included delineation of a unique forested wetland system located on former lake beach and ridge land formations. The area was determined to represent a unique natural resource requiring additional protection from future development. The wetland delineation was approved by the MDEQ as accurate and the owner received a wetland permit based on the delineation.

Key Volunteering Ecological Experience with the Huron River Watershed Council

Volunteer participant for many on-going projects including the following:

- Participant in the Annual Stream Measuring and Mapping of creeks and rivers in the watershed – Field collection of bank structure, channel and streambed data, patterns of flow, stream velocity and discharge calculations to provide overall ecological habitat quality (2007 to present).
- Stream gauging and water quality data collection – Captain of the biweekly assessments of Honey Creek, including stream flow gauging, and water chemistry and quality data collection. Data is used to determine e. coli concentrations and phosphate load carried by Honey Creek and the total maximum daily loading to the Huron River (2007 to present).
- Team Leader in the Annual Stonefly Collection – Collection of stoneflies from watershed streams in creeks annually in January used in assessing the health or degradation of the waterbody (2006 to present).
- Team Leader in the Semi-annual River Roundup – Collection of benthic macroinvertebrates in watershed streams and creeks used in assessing the ecological diversity and function of the macroinvertebrates in the stream or creek (2006 to present).
- Surveyor - Bioreserve Project: Rapid Ecological Assessment of Natural Areas in the Huron River Watershed – Field identification and assessment of the remaining natural, undeveloped lands in the watershed. Data collection included categorizing undeveloped land and surrounding areas by ecosystem, habitat and function, and prioritizing undeveloped property for field assessment and protection (2007 and 2008).
- Plant Expert in the Bioreserve Field Assessment of Natural Areas in the Huron River Watershed – Field assessment of wetlands, forests, grasslands and creeks for plant identification; vegetation structures, including tree size distributions, native vs. invasive species distribution; soil identification; signs of human disturbance; stream bank and water quality data. Data collected is scored to aid in determining the preservation ranking (2008).
- Participant in fundraising events and education awareness projects including Suds on the River and the Miller's Creek Film Festival (2007).

PREVIOUS WORK EXPERIENCE

Tetra Tech GEO (formerly GeoTrans), Ann Arbor, MI (2007-present), *Senior Project Geologist*, *Senior Geologist*
Insight BCI, Howell, MI (2007), *Senior Scientist*

Insight Environmental Services, Inc, Howell, MI (2002 - 2006), *Staff Scientist, Senior Scientist*

SPECIALIZED TRAINING

"Light Nonaqueous-Phase Liquids (LNAPLs): Science, Management and Technology" The Interstate Technology and Regulatory Council, October 16 and 17, 2012

"Light Non Aqueous Phase Liquid (LNAPL) Workshop" Michigan Department of Environmental Quality and American Institute of Professional Geologists, June 20 and 21, 2012

Canadian National Railroad, On-Track-Safety, 2011

"Access Beginning" Washtenaw Community College, 2009

"Access Intermediate" Washtenaw Community College, 2009

Project Management Training – Level 1 and 2, Tetra Tech, 2009

Tetra Tech Technical Writing Training Course, Tetra Tech, 2009

Risk-Based Corrective Action Applied at Petroleum Release Sites, ASTM, 2007

A Systemic Approach to Groundwater Capture Zone Analysis, U.S. Environmental Protection Agency, 2007

"Contractor - Local Government Workshop," MDEQ, Land and Water Management Division, 2005

"2005 Consultant Workshop," MDEQ, Land and Water Management Division, 2005

"Understanding and Accelerating Remediation of Contaminated Groundwater," Regenesis, 2004

SPECIALIZED ECOLOGICAL TRAINING

"Army Corps of Engineers Wetland Delineation and Regional Supplement Training," Richard Chinn Environmental Training, Inc., 2011

"Planning Hydrology, Vegetation, and Soils for Constructed Wetlands," Wetland Training Institute, Hickory Corners, Michigan, 2010

"Botany," Matthaei Botanical Gardens, University of Michigan, 2009

"Exploring Michigan's Rare Wetlands," Michigan Department of Environmental Quality, 2009

"Identifying Woodland Wildflowers" The Stewardship Network, 2008

"Plant ID Course", Matthaei Botanical Gardens, University of Michigan, 2008

"Wetland Flora," Institute of Botanical Training, LLC, Hastings, Michigan, 2005

"Asters and Goldenrods," Matthaei Botanical Gardens, University of Michigan, 2005

"Winter Botany," Matthaei Botanical Gardens, University of Michigan, 2004

"Spectacular Wildflowers," Matthaei Botanical Gardens, University of Michigan, 2004

"Fall Grasses," Matthaei Botanical Gardens, University of Michigan, 2004

"Spring Flora," Matthaei Botanical Gardens, University of Michigan, 2003

"Small Trees and Shrubs," Matthaei Botanical Gardens, University of Michigan, 2003

"Sedges," Matthaei Botanical Gardens, University of Michigan, 2003

"Orchids of Michigan," Matthaei Botanical Gardens, University of Michigan, 2003

"Michigan's Land and Water Permits Workshop," Michigan Department of Environmental Quality, 2003

"Wetland Delineation in Michigan," Matthaei Botanical Gardens, University of Michigan in cooperation with Michigan Department of Environmental Quality, US Department of Agriculture, Natural Resource Conservation Service, and the US Army Corps of Engineers, Detroit District, 2003

PUBLICATIONS AND PRESENTATIONS

McCall, P.J., Bagby, L.A., Blocker, J.E., *In-Situ Groundwater Remediation of Heavy Metals at an Active Manufacturing Facility;* Remediation of Chlorinated and Recalcitrant Compounds; The Seventh International Conference.

McCall, P.J., Moreira, N.F., Walter, L.M., Vasconcelos, C., McKenzie, J.A., *Role of Sulfide Oxidation in Dolomitization; Sediment and Pore-water Geochemistry of a Modern Hypersaline Lagoon System*. Geological Society of America

McCall, P.J., Szramek, K., Walter, L.M., *Arsenic Mobility in Groundwater/Surface Water Systems in Carbonate-rich Pleistocene Glacial Drift Aquifers (Michigan).* Applied Geochemistry

McCall, P.J., Szramek, K., Walter, L.M., *Arsenic Sources and Sinks in a Surface Water/Groundwater System: Tracking Recharge to Discharge in Glacial Drift Deposits (Hell, Michigan)*. Geological Society of America Annual Conference

Moreira, N.F., McCall, P.J., Walter, L.M., *Hydrogeochemistry of a Modern Dolomite-forming Lagoon System (Cabo Frio-Rio de Janeiro, Brazil): Role of Sulfide Oxidation*. J.A. Goldschmidt Annual Conference

McCall, P.J., *Geochemistry of the Inland Steel Landfill Groundwater: A Preliminary Investigation*. Presented to Law Environmental Consulting Firm, Atlanta, Georgia

TETRA TECH

Joy Gryzenia
Project Geologist

Ms. Gryzenia is a Project Geologist with over 2 years of experience performing soil and groundwater sampling using multiple sampling techniques, and has completed vertical profiling of shallow and deep aquifers for groundwater monitoring purposes. Ms. Gryzenia has experience with contractor oversight, drilling and well installation using hollow stem auger, roto-sonic, and direct push drilling methods. She has worked on soil boring, recovery, and well installation including observation, monitoring, injection and extraction wells. She has also assisted in in-situ application of integrated carbon and zero valent iron for treatment of nickel and chromium impacts using direct push drilling methods. Ms. Gryzenia has experience with excavation oversight and is trained in using a Leica 1200 global positioning system (GPS) for surveying. She routinely assists project managers with gINT, Mining Visualization Software (MVS), Microsoft excel, access and word, writing closure reports, proposal preparation, and performing Phase I site assessments.

Proficient in the following computer programs: Mining Visualization Software (MVS), Microsoft Office suite of programs: Word, Excel, Power Point and Access.

Education:

M.S., Geosciences, Western Michigan University, Kalamazoo, Michigan, 2010

B.S., Geology, Grand Valley State University, Allendale, Michigan, 2008

Hydrogeology Field Camp, Western Michigan University, Kalamazoo, Michigan, 2009

Indiana University Geologic Field Station, Indiana University, Cardwell, Montana, 2008

Registrations/Certifications:

8-Hour HAZWOPER Refresher, 29 CFR 1910.120 (e)(8) OSHA, 2010 to present

40-Hour HAZWOPER Training + 24-Hours of Field Training, 29 CFR 1910.120 OSHA, 2009

Adult First Aid, CPR, and AED certified, 2012

e-RAILSAFE Contractor certified (2011)

CN – Rail Safety certified (2012)

Office:

Ann Arbor, Michigan

Years of Experience:

Two

Years with Tetra Tech:

Two

EXPERIENCE

Environmental Site Characterization and Property Transfer

East Stadium Boulevard Bridge Project, Ann Arbor, Michigan – Staff geologist responsible for sampling a soil characterization plan prior to replacement of the East Stadium Boulevard Bridge and associated and nearby utility infrastructure. Responsibilities included reviewing nearby facility data, aiding the senior geologist in developing a sampling plan for infrastructure routes along the boulevard and the six earthen walls surrounding the bridge, implementing a hand auger and direct push drilling plan, completing a statistical analysis of soil concentrations above applicable criteria and preparing a letter report of findings and recommendations. The age of the fill used to build the earthen walls surrounding the bridge and the past industrial uses in the area required an extensive sampling plan. Additional area information and statistical analysis were used to reduce the sampling parameters and coordination with local landfill operations prior to sampling implementation helped to reduce the overall number of samples required.

Phase III Soil and Groundwater Investigation, Confidential Client, Michigan – As Staff Geologist, was the field lead for a Phase III soil and groundwater investigation to identify previously recognized concerns at an inactive particle board manufacturing plant. Lithology was logged and shallow soil samples were collected using GeoProbe direct push drilling methods. A shallow groundwater investigation was completed by vertically profiling the groundwater for nitrate, total dissolved solids and specific conductivity. Temporary monitoring wells were installed at the depth with the highest parameter of concern and the wells were sampled using low-flow techniques. A deep groundwater investigation was also conducted in 4 locations, using roto-sonic drilling techniques. Again, vertical

profiling was conducted for nitrate, total dissolved solids and ammonia and monitoring wells were installed and sampled.

Soil Impact Delineation and Characterization, Canadian National Railroad, Detroit, Michigan – Staff geologist responsible for assisting the senior geologist in developing a sampling plan at a former railroad junction and carrying out the soil delineation and characterization sampling plan. As field lead, completed test pits and soil borings to delineate an abandoned diesel fuel line and its associated impacts. Using survey equipment, coordinates of the sample locations were collected. Sample results were analyzed and a remediation plan and focused feasibility are being developed.

Laser Induced Fluorescence Soil Characterization, Canadian National Railroad, Detroit, Michigan – Project Geologist responsible for assisting the senior geologist in developing a delineation plan using laser induced fluorescence (LIF) and carrying out the soil delineation. As field lead, completed LIF borings to delineate diesel fuel impacts at the site. Soil samples were collected from three borings to correlate soil analytical results to LIF result borelogs.

Soil and Waste Sampling, Confidential Client, Jackson, Michigan - Completed soil borings using the hand auger drilling method to collect soil samples for PCB analysis. Additional sampling was completed to determine whether the source of PCBs was originated from the waste on site. Test pits were completed with a backhoe, soil was screened with a PID, and the soil was described and documented. Assisted the project manager in data analysis and report organization.

Municipal Waste Landfill, Ann Arbor, Michigan – Staff geologist responsible for oversight of a leachate outbreak repair. A leachate outbreak was discovered in the summer of 2006, and after investigating the cause of the outbreak, a clay cap repair was implemented. Vegetation and upper topsoil was removed and stockpiled for later use. Clay meeting the requirements for hydraulic conductivity was added in lifts, totaling 2 feet. Compaction testing was completed before 6 inches of topsoil was added and compacted. Grass seed, fertilizer, and straw was added as final cover.

Submerged Oil Task Force, Enbridge Oil Release, Marshall, Michigan – Used a Leica GPS unit to stakeout to possible submerged oil locations along a 38-mile long portion of the Kalamazoo River. Also took survey locations of highly oil contaminated areas, and delineated the extent of oil in these areas. Sampling of the sediment core samples collected along the Kalamazoo River was also completed.

Phase I Site Assessment, Baker College, Port Huron, Michigan – Completed a Phase I site assessment for Baker College in Port Huron, Michigan. The assessment included a site walk, contacting former property owners and conducting interviews, reviewing aerial photographs, topographic maps, and soil classification maps, and reviewing a radius map report.

Phase I Site Assessment, ADESA, Bay City, Michigan – Assisted a project manager with a Phase I site assessment for ADESA, Inc., in Bay City, Michigan. The assessment included reviewing aerial photographs, topographic maps, soil classification maps and reviewing a radius map report to identify recognized environmental concerns in the area.

Phase I Site Assessment, City of Port Huron, Port Huron, Michigan – Assisted a project scientist with a Phase I site assessment for the City of Port Huron in Port Huron, Michigan. Ms. Gryzenia's role included a site walk, reviewing aerial photographs, topographic maps, soil classification maps and reviewing a radius map report to identify recognized environmental concerns in the area.

Phase I & Phase II Site Assessment, SmithGroupJJR, City of Ann Arbor, Michigan – Completed a Phase I site assessment for SmithGroupJJR for a former fleet services center and city garage in Ann Arbor, Michigan. The assessment included reviewing aerial photographs, topographic maps, soil classification maps, Sanborn maps, city directories, and a radius map. Ms. Gryzenia helped to identify recognized environmental concerns in the area and completed a site walk and interview. A Phase II sampling plan was developed after completing the Phase I site assessment. Ms. Gryzenia aided in developing the sampling plan and cost estimates.

Remediation Project Experience

Municipal Waste Landfill, Ann Arbor, Michigan – Staff geologist responsible for completing well installations and injection of an emulsified vegetable oil (EVO) created by EOS™ as part of a bioremediation pilot test. The pilot test was initiated to treat a vinyl chloride plume downgradient of the City's municipal solid waste landfill. Responsibilities included drilling oversight for installation of seven injection wells and one observation well, recording lithology, sampling soil, creating digital well logs and developing observation and injection wells with a peristaltic pump. Injections were delivered through an eight-channel manifold system connected to each injection well from 55 gallon drums of EVO. The EVO injections were followed by a water flush using the City's water hydrant.

Automotive Manufacturing Facility, Confidential Client, Michigan - Staff Geologist responsible for *in-situ* Application of EHC-M™ a reductive zero-valent iron substrate utilized in metal fixation, as a chemical and bioremediation technique for chromium and nickel contamination. Using direct push drilling methods, soil borings were pushed to depth, and injections of integrated carbon and zero valent iron were completed. Ms. Gryzenia assisted the project manager in planning, data analysis and performance monitoring sampling.

Automotive Manufacturing Facility, Confidential Client, Michigan – Staff Geologist responsible for excavation oversight and oil water separator installation of a 33,000 square foot area with PCB impacts. Ms. Gryzenia oversaw the installation of two oil water separators in a wetland area. Took soil samples to verify the contaminant was removed to below detection limits. Wetland restoration was completed after the impacted soil was removed. Assisted the project manager with data analysis, and writing a report for clean closure.

Bioaugmentation and Groundwater Sampling, Visteon Systems, LLC, Connersville, Indiana - As Staff geologist, performed groundwater sampling to monitor performance of in-situ groundwater bioremediation systems. Performed low flow sampling to demonstrate compliance for a regulatory agency. Completed injections of bacteria for purposes of creating an anaerobic biological groundwater treatment zone.

Automotive Manufacturing Facility, Confidential Client, Michigan – Staff Geologist responsible for a soil investigation and hazardous waste excavation oversight. Ms. Gryzenia planned and oversaw a delineation investigation of VOC contaminated soil. The area is a former landfill that was previously excavated, but still had high levels of trichloroethene and its daughter products. The area of concern was separated into a grid pattern and

was sampled using the direct push drilling method. Samples were collected in accordance to ST3M regulations and were submitted for laboratory analysis. The delineation sampling lead to planning a phased-approach excavation. A phased approach was planned because the area of concern was partially located in a wetland, requiring a wetland permit before excavation activities could begin. Ms. Gryzenia was the field lead for the excavation that removed over 700 tons of hazardous soil and 9000 tons of non-hazardous soil. Level C personal protective equipment was

maintained during the hazardous waste excavation, requiring the use of personal air monitoring badges on all personnel involved in the excavation activities. Continuous air monitoring was completed using an LEL and PID to ensure worker's safety. Ms. Gryzenia assisted in data analysis, and planning of the excavation. Assisted the project manager in writing a work plan addendum and work plan addendum 2 to be submitted to the state. Mining Visualization Software (MVS) was used by Ms. Gryzenia to create maps and cross sections of the impacted subsurface. Once the excavation phases were complete, Ms. Gryzenia assisted in the writing the interim measures implementation report, completed data analysis tables, compiled appendices and waste documents.

Automotive Manufacturing Facility, Confidential Client, Michigan – Staff Geologist responsible for overseeing a horizontal well installation for a soil vapor extraction system. Oversaw the installation of two horizontal wells, each over 400 foot long, that reached under the floor of the manufacturing plant, to aid in the extraction of hazardous soil vapors. Duties included tracking the progress of the drilling, documenting field events, and contractor coordination.

Automotive Manufacturing Facility, Confidential Client, Michigan – Staff Geologist responsible for aiding in the planning and developing of a soil investigation and overseeing an impacted soil excavation. Assisted in the development of a sampling plan at a former chromium waste treatment facility. The treatment facility was scheduled to be demolished, but before a soil sampling event was completed to determine whether the underlying soils were impacted. After the investigation, sample results were analyzed and it was determined that the soil was impacted. A delineation sampling event was completed and impacted soils were excavated. As a staff geologist, Ms. Gryzenia was responsible for excavation oversight and disposal paperwork. Ms. Gryzenia assisted the project manager in writing a work plan addendum to be submitted to the state. Mining Visualization Software was used to create maps and cross sections of the impacted subsurface.

Automotive Manufacturing Facility, Confidential Client, Michigan – Project Geologist responsible for aiding in the planning of a landfill cap repair and overseeing the contractors work. Construction debris that was exposed at the surface was removed and transported to a landfill. The area was then covered with topsoil and seeded.

Municipal Waste Landfill, Ann Arbor, Michigan –Staff Geologist responsible for overseeing the installation of a new discharge line, two purge wells, and two acid injection wells at a Muncipal Waste Landfill. Two damaged purge wells and two acid wells were abandoned and the replacements were installed near the locations of the previous wells. Before determining the well depth, soil samples were collected using a split spoon sampler and lithology was logged by the staff geologist. Ms. Gryzenia also assisted in the development of a letter report to the city and county describing field activities and well construction details.

Groundwater Sampling

Automotive Manufacturing Facility, Confidential Client, Michigan - As a Staff Geologist, performed monthly, quarterly, and yearly groundwater sampling using low-flow techniques to collect water samples for laboratory analysis of various parameters.

Groundwater Sampling, City of Hartland, Michigan - Performed annual groundwater sampling using bailer, low-flow and high-flow techniques to collect water samples for laboratory analysis of various parameters.

Groundwater Sampling, Confidential Client, Michigan – Performed quarterly groundwater sampling using modified high-flow techniques to collect water samples for laboratory analysis of various parameters. A submersible pump was used to purge the well, and an MP20 water quality meter was used to collect and record water quality parameter readings.

Publications and Presentations

Gryzenia, Joy T., *Production, accumulation, and characterization of surfactants produced during the chemical oxidation of PAH contaminated soil.* Western Michigan University (2010) 108 pages.

Gryzenia, J., Cassidy, D., Hampton, D. *Production and accumulation of surfactants during the chemical oxidation of PAH in soil.* Chemosphere 77, (2009) 540-545.

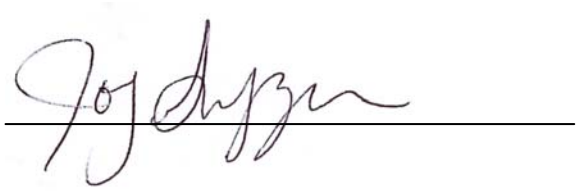
Gryzenia, J., Cassidy, D., Hampton, D. *Production and accumulation of surfactants during the chemical oxidation of PAH in soil.* Geological Society of America Annual Conference, Portland, Oregon.

SIGNATURE OF ENVIRONMENTAL PROFESSIONAL

I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental professional* as defined in §312.10 of 40 CFR 312.

I have the specific qualifications based on education, training, and experience to assess a *property* of the nature, history, and setting of the subject *property*. I have developed and performed all the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Patti McCall
Senior Geologist



Joy Gryzenia
Project Geologist

TETRA TECH

August 15, 2013

Matthew Naud
City of Ann Arbor
Environmental Coordinator
301 East Huron Street
Ann Arbor, MI 48107-8647

RE: Phase II Environmental Site Assessment
415 W. Washington Street, Ann Arbor, Michigan

Dear Mr. Naud,

Tetra Tech (Tt) was contracted by the City of Ann Arbor for a Phase II Environmental Site Assessment (ESA) at 415 W. Washington Street (subject property). The subject property is located along the south side of W. Washington Street between S. 1st and 3rd Streets in Ann Arbor, Michigan (**Figure 1**). The subject property is currently occupied by a parking lot and U-shaped buildings. Portions of the buildings are used to store City of Ann Arbor and Republic Parking Services (RPS) materials and equipment. The following activities were completed for the Phase II ESA:

- Existing groundwater monitoring well sampling on January 15 and 16, 2013
- Storm water sampling on January 16, 2013
- Subsurface investigation on February 24, 2013
    - Six soil borings advanced and soil samples collected
    - Two temporary monitoring wells installed and groundwater and soil samples collected
    - Five monitoring wells installed and groundwater and soil samples collected
- New groundwater monitoring well sampling on March 7, 2013

These activities are described in detail below.

Soil Boring and Monitoring Well Installation

Based on groundwater sample results, historical uses and information gathered for the Phase I ESA, a Phase II ESA subsurface investigation was completed. An onsite joint MISSDIG meeting with the City of Ann Arbor utilities was conducted on February 22, 2013. Soil borings were cleared and utilities were marked before any subsurface activities were performed. Thirteen soil borings were completed using direct push methods and a macro core sampler with a Geoprobe 6620DT. The rationale for completing these locations are as follows:

- SB-1-13, SB-2-13, SB-3-13 and SB-4-13 were advanced to collect soil samples for delineation of historical soil polynuclear aromatics (PNA) concentrations near AH17-1 and AH17-2 (**Figure 2**). These historical borings were not delineated in 1994 and each had elevated concentrations of total PNAs.

710 Avis Drive, Ann Arbor, MI 48108
Tel 734.213.2204 Fax 734.213.5008 www.tetratech.com

- SB-5-13 and SB-6-13 were advanced adjacent to existing monitoring wells MW-10 and MW-2 respectively. The purpose of the soil borings was to ensure soils were not currently impacted.
- MW-1R-13 and MW-3R-13 were installed to replace previously existing MW-1 and MW-3, which City Surveyors were unable to locate.
- MW-6R-13 and MW-11R-13 were installed to replace MW-6 and MW-11. These wells were located by City Surveyors but were too shallow to be productive.
- TW-1-13 and TW-2-13 are temporary monitoring wells that were installed to delineate trichloroethene (TCE) detected in existing monitoring wells MW-2 and MW-5 (see next section) and to investigate historical use of both the south garage chemical area and the lawn mower repair shop.
- MW-13-13 was installed to delineate TCE detected in existing monitoring wells MW-2 and MW-5.

Soil borings were completed on February 24, 2013. The soil was field screened using a photoionization detector (PID) at every foot and were biased to visually or olfactorily impacted areas. Samples were collected for laboratory analysis at the highest measurement on the PID in the unsaturated zone. Samples were analyzed for volatile organic compounds (VOCs) and PNAs depending on the location and historical use of the area. Soil boring and monitoring well installation logs including well construction information are included in **Appendix A**. The lithological description and depth that the soil sample was collected is summarized in **Table 1**.

Soil Sampling Results

Two soil borings that were advanced in the early 1990s (AH17-1 and AH17-2) identified PNA impacts. The extent of the impacts were not delineated at that time. For these locations, soil samples were collected at a depth in the unsaturated zone to determine vertical delineation. These sample results are discussed separately from the other soil borings completed onsite due to a different source area. Laboratory analytical results are included as **Appendix B**. Analytical results were compared to the Michigan Department of Environmental Quality's (MDEQ) Part 201 Generic Cleanup Criteria and Risk-Based Screening Levels (Part 201 Criteria). Results for SB-1-13 and SB-3-13 are summarized on **Table 2** and indicate the following:

- Select PNAs were detected above method detection limits (MDLs) and below reporting limits (RLs);
- Select PNAs exceed RLs and are below Part 201 Criteria;
- Acenaphthylene was detected at concentrations exceeding residential drinking water protection (RDWP) criteria;
- Fluoranthene, fluorene and naphthalene were detected at concentrations exceeding groundwater to surface water interface protection (GSIP);
- Phenanthrene was detected at a concentration exceeding RDWP and GSIP criteria; and
- Benzo(a)pyrene was detected at a concentration exceeding direct contact (DC) criteria.

These impacts are primarily detected in the soil sample collected from SB-1-13 at 2.5 feet below ground surface (bgs). A second sample collected at 5 feet bgs from the same soil boring has concentrations detected below reporting limits, indicating that impacts are delineated vertically. Soil samples were not collected from SB-2-13 and SB-4-13 because PID, visual and olfactory observations did not suggest soil impacts were present. An approximate area extent of the PNA impact is identified on **Figure 2**.

The remaining soil samples collected onsite were compared to MDEQ Part 201 Criteria. A summary of the soil results are included on **Table 2** and **Figure 2** and indicate the following:

- Select PNAs and VOCs were detected above MDL and below RLs;
- Isopropylbenzene, methylcyclohexane, tetrachloroethane, and 2-methylnaphthalene exceed RLs and are below Part 201 Criteria;
- TCE and benzene were detected at concentrations exceeding RDWP and non-residential drinking water protection (NDWP) and criteria;
- Naphthalene was detected at concentrations exceeding GSIP; and
- Xylenes and ethlybenzene were detected at concentrations exceeding NDWP, RDWP and GSIP criteria.

These impacts represent two different soil impact areas above applicable criteria. One soil impact area is located primarily within the vicinity MW-6R-13 and is associated with the historical fuel releases at the subject property. The second impact area is located in the southwestern corner of the property and represents a contaminant (TCE) not identified onsite during remediation in the 1990s. Approximate area extents are identified on **Figure 2**. The diagonal lines indicate area of potential impact that may warrant further investigation.

Groundwater Samples and Results

Prior to groundwater sampling on January 15, 2013, City of Ann Arbor survey personnel were onsite to locate the existing monitoring wells. Tt georeferenced a historical map and provided coordinates for the City Surveyors. The historical map includes eleven monitoring wells that were installed in the 1990s. The surveyors were able to locate all monitoring wells except three (MW-1, MW-3, and MW-7). Surveyors also located piezometers P-1, P-2 and P-3. Each piezometer well contains a cluster of four 1" diameter wells, each set at a different total well depth within the aquifer. City of Ann Arbor surveyors returned on March 7, 2013 to survey newly installed monitoring wells and temporary monitoring well and soil boring locations.

Tt personnel completed groundwater sampling as follows (**Figure 3**):

- Eight existing monitoring wells: MW-2, MW-4, MW-5, MW-6, MW-8, MW-9, MW-10 and MW-11;
- One piezometer: P-3-15';
- Four replacement monitoring wells: MW-1R-13, MW-3R-13, MW-6R-13 and MW-11R-13, installed in close proximity to the historical locations;
- Two temporary wells: TW-1-13 and TW-2-13; and

- One new monitoring well: MW-13-13 to delineate TCE impacts.

Temporary wells TW-1-13 and TW-2-13 were constructed of 1" diameter PVC casing and 1" diameter 10 slot PVC screen. Both temporary wells had a total well depth of 12 feet and a 5 foot screen interval from 7 to 12 feet bgs. The two temporary wells were located within the west and south garage to delineate TCE and verify that historical practices had not impacted the subsurface. Permanent monitoring wells were constructed of 2" diameter PVC casing and 2" diameter 10 slot PVC screen. Total well depth, screen interval and groundwater depth are summarized on **Table 3** for all locations onsite.

Prior to groundwater sampling, water levels were recorded and the wells were purged using low-flow methods. Water quality parameters were recorded and stabilized before the samples were collected. Groundwater samples were analyzed for PNAs, chloride, VOCs, and metals (silver, arsenic, barium, cadmium, chromium, nickel, lead, selenium, zinc, sodium and mercury). Monitoring well MW-8 was sampled for polychlorinated biphenyls (PCBs).

Groundwater sampling results are summarized on **Table 4** and are depicted on **Figure 3**. The laboratory analytical reports are included as **Appendix B**.

- PCBs were not detected above MDLs;
- Select PNAs, VOCs and metals were detected above MDLs and below RLs;
- Select VOCs, naphthalene, arsenic, barium, nickel, and zinc were detected at concentrations exceeding RLs and below Part 201 Criteria;
- Sodium, chloride, benzene, and trichloroethene (TCE) were detected at concentrations exceeding residential drinking water criteria (RDW) and non-residential drinking water criteria (NDW); and
- Benzene, ethylbenzene, xylenes, naphthalene, and phenanthrene were detected in concentrations exceeding groundwater to surface water interface (GSI) criteria.

A detection of mercury exceeding GSI criteria was reported in MW-8 on January 15, 2013. A groundwater sample was collected on March 7, 2013 to verify the earlier result. Mercury was not detected in the March 7, 2013 sample therefore, the January result is not considered valid.

Two separate groundwater impact areas are identified on **Figure 3** above applicable criteria. The first impact area is associated with the historical fuel release onsite and is primarily gasoline components with minor diesel fuel components. This area is not delineated. The highest concentration of benzene was detected at MW-11R-13 at 420 micrograms per liter (ug/L). There are no monitoring locations further north to determine the extent of the impacts.

The second impact area is related to the TCE identified in the southwest corner of the subject property. The TCE was identified in five monitoring locations onsite and decreases in concentration to the northeast.

Sodium and chloride were detected in concentrations exceeding RDW and NDW. However, due to the

ubiquitous presence across the site, a plume was not identified on **Figure 3**.

Storm Water Sampling and Results Section

Tt personnel collected a storm water sample (Storm Water-1) from a drain located east of the north garage (**Figure 1**). Water quality parameters were recorded and the results are summarized in **Table 5**. The sample was analyzed for VOCs, PNAs, PCBs and the metals listed above. The laboratory analytical reports are included as **Appendix B.** Laboratory analytical results indicate the following:

- PCBs were not detected above MDLs;
- Select metals and PNAs were detected above MDLs but below RLs; and
- Sodium, barium, zinc, and chloride were detected above RLs.

Groundwater Flow

Sitewide groundwater flow is depicted on **Figure 4**. Based on static water levels collected on March 7, 2013, groundwater flow is to the north/northeast. Regional groundwater flow is northeast toward the Huron River. Groundwater is essentially flat across the property ranging from 793.4 feet in the southwest to 792.9 at MW-9 on the north side of W. Washington Street. The contour interval is 0.1 foot.

Conclusions and Recommendations

Three separate soil impact areas and two groundwater impact areas above applicable criteria were identified on the subject property. These are summarized below with recommendations for each.

<u>Historical Fuel Release</u>

Both soil and groundwater impacts exists above applicable criteria as a result of the historical fuel release onsite. Additional subsurface investigation is recommended to determine the extent of the soil and groundwater impacts. The benzene concentrations detected in groundwater at MW-11R-13 require delineation to determine the northern extent of the impacts and if offsite migration has occurred.

Soil impacts identified at MW-6R-13 may be isolated to a smaller area. Groundwater was encountered at a depth of 11 feet bgs in the soil boring for MW-6R-13; just below the collection of a sample from the peat layer identified at 10.5 to 11 feet bgs. However, other soil borings completed onsite encounter groundwater at a shallower depth (5.5 to 7 feet bgs) and also encounter the peat layer shallower. Groundwater was encountered at 9 feet bgs at monitoring well MW-1R-13, located just west of MW-6R-13. The area between and around these two monitoring wells should be investigated to determine the extent of the historical fuel impacts in soil.

<u>Historical PNA Impacts</u>

Impacts above applicable criteria were not identified near AH17-1 in the northeastern corner of the subject property. However, concentrations exceeding applicable criteria and historical concentrations were identified at 2.5 feet bgs near AH17-2. One parameter, benzo(a)pyrene was detected above direct contact criteria. The area appears to be isolated and shallow. Tt recommends a hot spot excavation to approximately 5 feet bgs. Additional verification sampling is recommended to confirm that the contaminants have been removed.

TCE Impacts

Applicable criteria for TCE is exceeded in both soil and groundwater in the southwest corner of the subject property. Information collected and reviewed during the Phase I ESA did not include the use of TCE on the subject property. However, to confirm historical use of the west and south garages, two temporary monitoring wells were installed and groundwater samples collected for VOCs. Monitoring well MW-13-13 was installed as close to the southeast property corner as possible to determine if an offsite source was plausible. TCE was the only parameter detected above applicable criteria at these three locations (TW-1-13, TW-2-13 and MW-13-13) and 1,1,2-trichloroethane was detected above RLs in the same three locations. These impacts are highly likely from an offsite source based on their location, historical use of the property, the concentration gradient on the subject property (decreasing concentration from southwest to northeast) and other information contained in the Phase I ESA. Two offsite properties were identified in the Phase I ESA as requiring further consideration. Tt recommends completing FOIA requests for each site to determine parameters of concern, their concentrations and known extent for these properties.

If you have questions, please do not hesitate to contact us at 734-213-4069.

Sincerely,

Craig W. Dechy
Staff Geologist

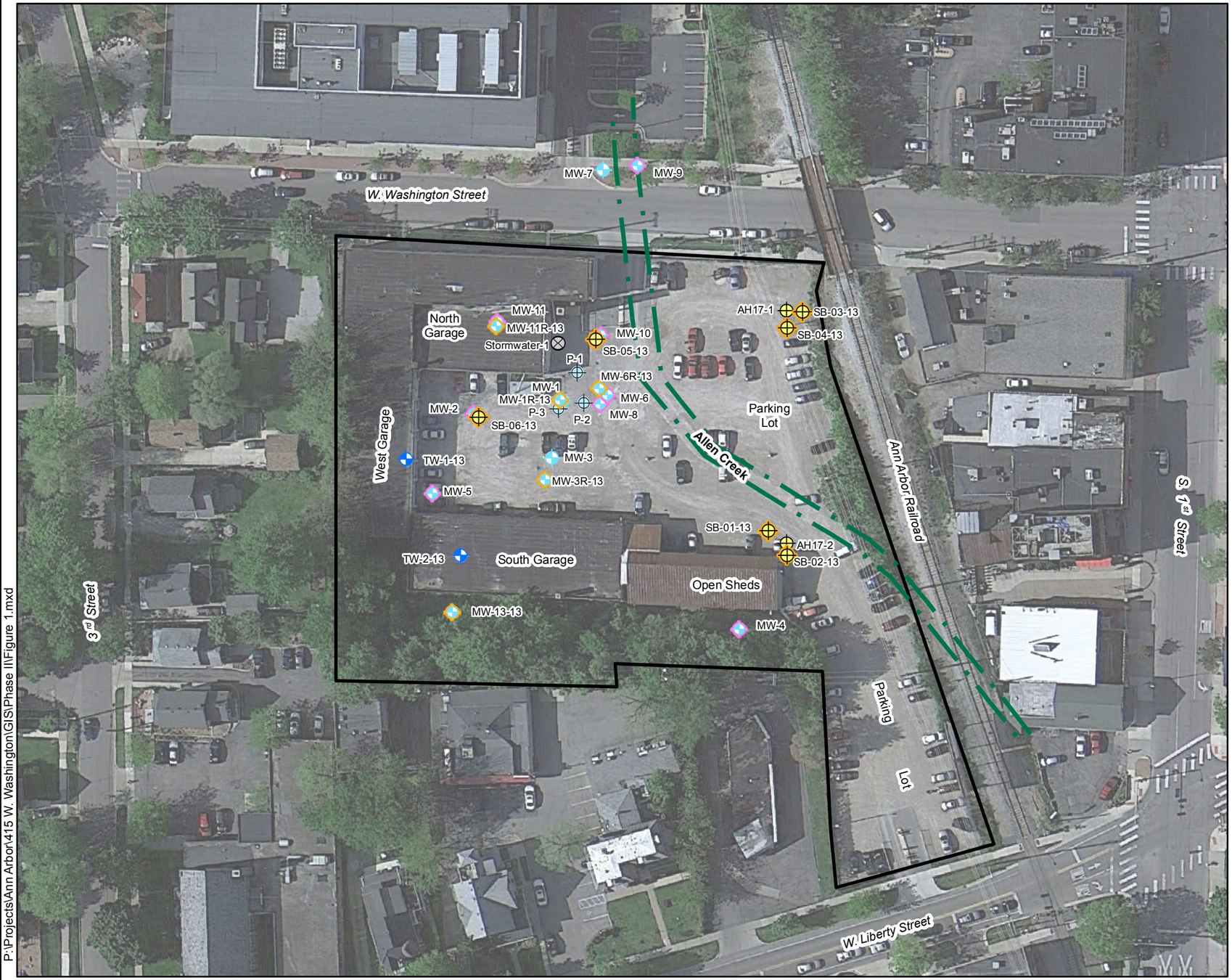
Patti McCall
Senior Geologist

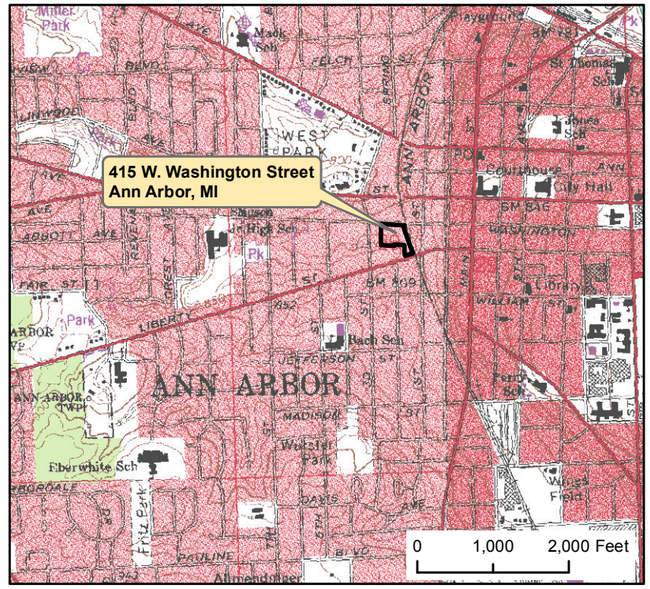
Figure 1 – Site Location and Layout Map
Figure 2 – Soil Analytical Results
Figure 3 – Groundwater Analytical Results
Figure 4 – Groundwater Elevation Contour Map

Table 1 – Soil Sample Descriptions
Table 2 – Soil Analytical Results
Table 3 – Groundwater Monitoring Well Construction and Elevation Data
Table 4 – Groundwater Analytical Results
Table 5 – Stormwater Analytical Results

Appendix A – Soil Boring and Monitoring Well Logs
Appendix B – Groundwater and Soil Laboratory Analytical Reports

FIGURES





- 2013 Monitoring Well (MW)
- Previously Existing Monitoring Well (MW)
- Temporary Monitoring Well
- Historical Monitoring Well (MW)
- Piezometer (P)
- 2013 Soil Boring
- Historical Soil Boring
- Stormwater Sample Location
- Allen Creek
- Property Boundary

MW = Monitoring Well
TW = Temporary Well
P = Piezometer
SB = Soil Boring
AH = Auger Hole

N

0 70 140 Feet

Notes:

1. Survey data for existing monitoring wells were collected by City of Ann Arbor on January 15 and 16, 2013.
2. New wells and soil borings were completed in February 2013. Survey data for new wells were collected by City of Ann Arbor on March 7, 2013.
3. Historical monitoring wells were not located during field activities and may be abandoned.
4. Location of property boundary, Allen Creek, historical wells and historical soil borings are approximate.

P:\Projects\Ann Arbor\415 W. Washington\GIS\Phase II\Figure 1.mxd

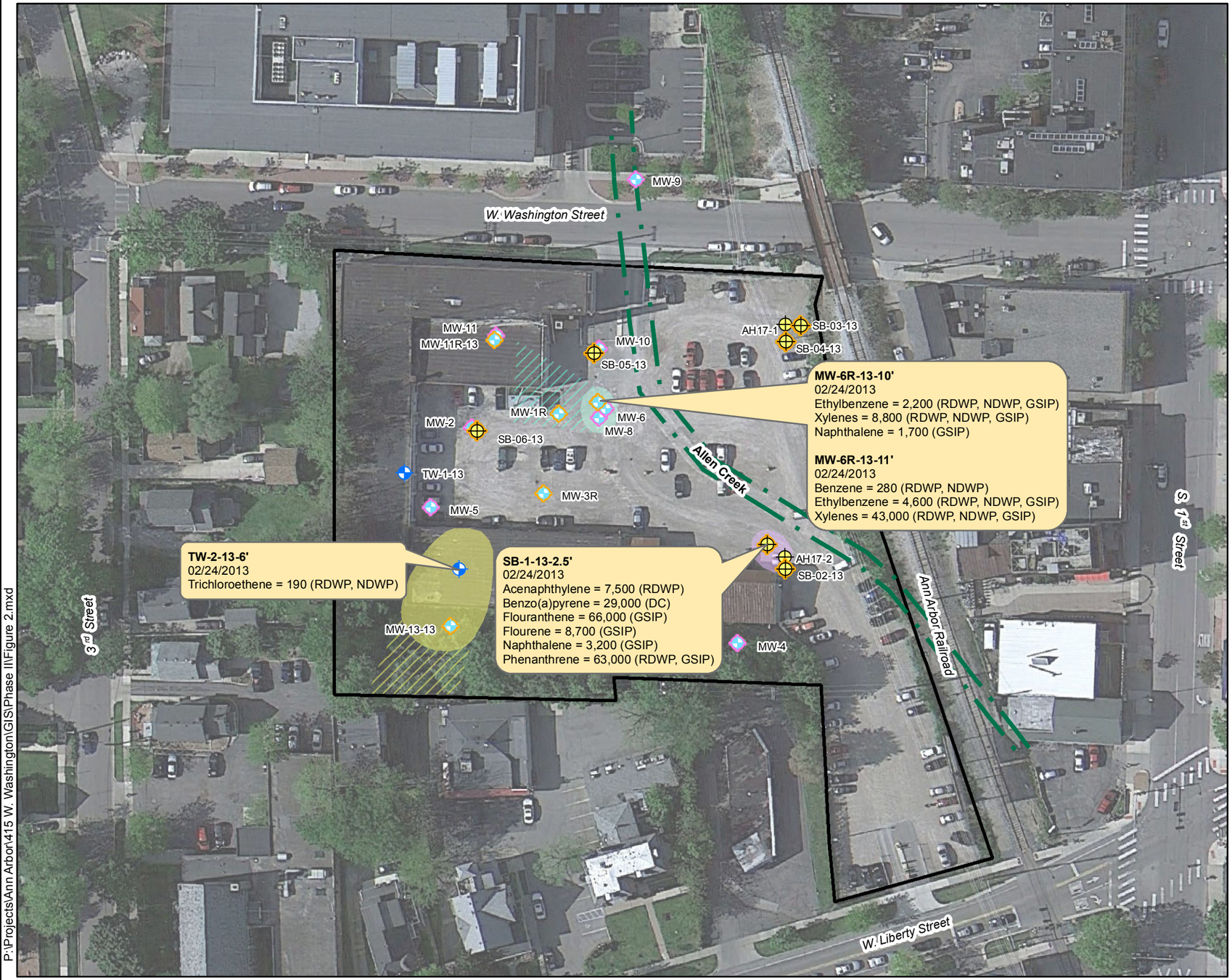
BASE MAP: MAY 2010 GOOGLE EARTH IMAGERY

ORIGINAL BY: A. RAUSS	
DATE: 04/11/2013	
REVISED BY: A. RAUSS	
DATE: 08/14/2013	

415 W. WASHINGTON STREET
PHASE II ESA
ANN ARBOR, MICHIGAN

SITE LOCATION AND LAYOUT MAP

FIGURE
1



2013 Monitoring Well (MW)
Previously Existing Monitoring Well (MW)
Temporary Monitoring Well
2013 Soil Boring
Historical Soil Boring
Approximate Area of Fuel Related Impacts
Approximate Area of TCE Related Impacts
Approximate Area of PNA Related Impacts
Areas of Potential Fuel Related Impacts
Areas of Potential TCE Related Impacts
Allen Creek
Property Boundary

Soil Result

TW-2-13-6' — Sample Name
02/24/2013 — Sample Date
Trichloroethene = 190 (RDWP, NDWP) — Exceeded Criteria
Concentration (micrograms per kilogram)
Exceeded Parameter

MW = Monitoring Well
TW = Temporary Well
SB = Soil Boring
AH = Auger Hole
PNA = Polynuclear Aromatic Hydrocarbon
TCE = Trichloroethene
RDWP = Residential Drinking Water Protection Criteria
NDWP = Nonresidential Drinking Water Protection Criteria
GSIP = Groundwater to Surface Water Interface Protection Criteria
DC = Direct Contact Criteria

Notes:

1. Soil results include concentrations that exceed Soil Part 201Generic Cleanup Criteria and Screening Levels (RBSLs), September, 2012. Explanations of criteria shown can be found in the Michigan Department of Environmental Quality Footnotes document.
2. Results are expressed in micrograms per kilogram (ug/kg).
3. Locations were not all sampled for same parameters. Refer to Laboratory Reports included in Appendix B and the summary of results provided as Table 1 for more details.
4. Location of property boundary, Allen Creek, historical wells and historical soil borings are approximate.
5. Due to lack of visual, olfactory or measurement on the PID; a soil sample was not collected from SB-2-13 and SB-4-13.
6. With the exception of historical borings AH17-1 and AH17-2, all locations were surveyed by the City of Ann Arbor in 2013.

N

0 70 140 Feet

BASE MAP: MAY 2010 GOOGLE EARTH IMAGERY

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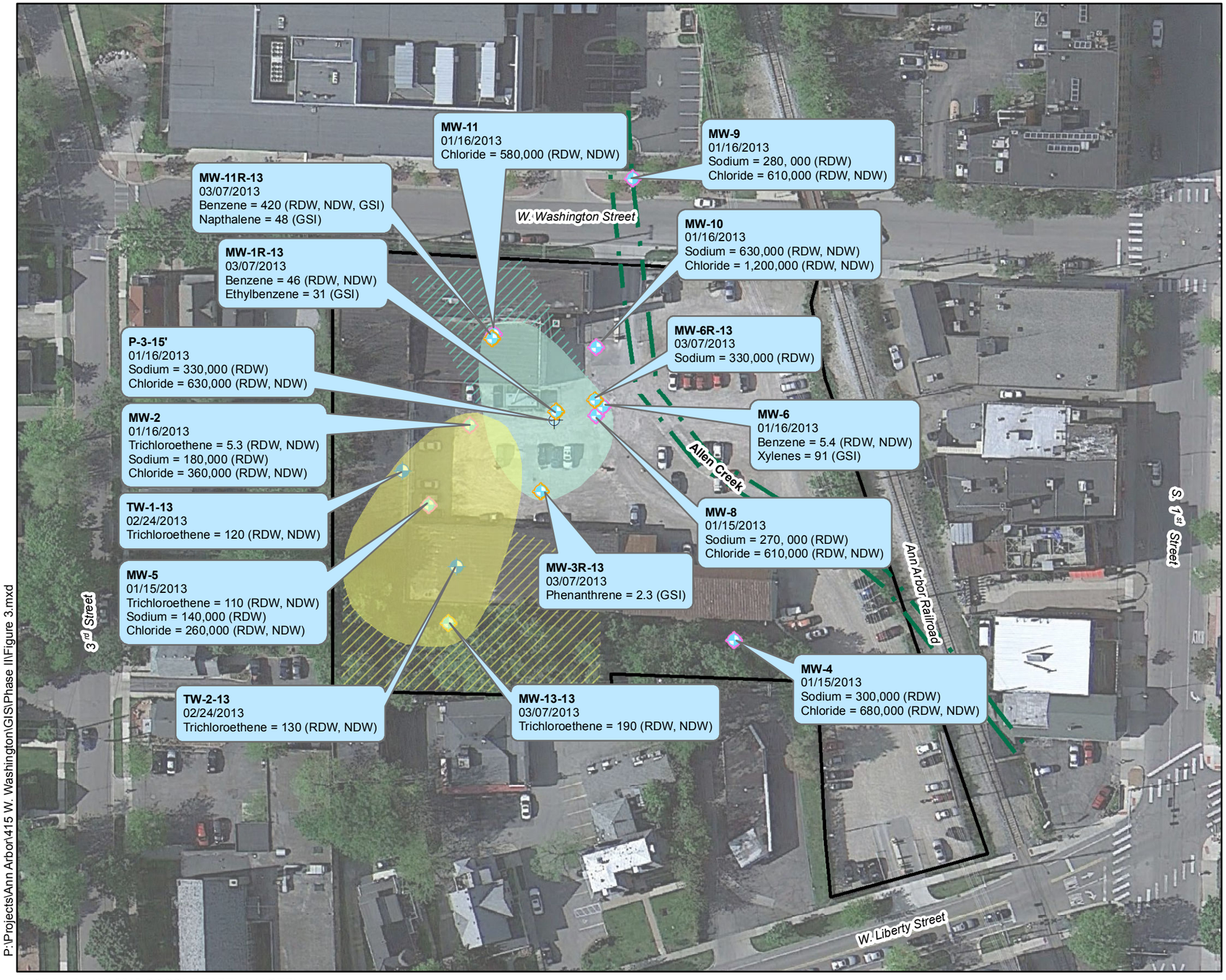
ORIGINAL BY: A. RAUSS	
DATE: 04/11/2013	
REVISED BY: A. RAUSS	
DATE: 08/15/2013	

415 W. WASHINGTON STREET
PHASE II ESA
ANN ARBOR, MICHIGAN

SOIL ANALYTICAL RESULTS

FIGURE
2



BASE MAP: MAY 2010 GOOGLE EARTH IMAGERY

P:\Projects\Ann Arbor\415 W. Washington\GIS\Phase II\Figure 3.mxd

- 2013 Monitoring Well (MW)
- Previously Existing Monitoring Well (MW)
- Temporary Monitoring Well
- Piezometer (P)
- Approximate Area of Fuel Related Impacts
- Approximate Area of TCE Related Impacts
- Areas of Potential Fuel Related Impacts
- Areas of Potential TCE Related Impacts
- Allen Creek
- Property Boundary

Groundwater Result

TW-1-13 — Sample Name
02/24/2013 — Sample Date
Trichloroethene = 120 (RDW, NDW) — Exceeded Criteria
Concentration (micrograms per liter)
Exceeded Parameter

MW = Monitoring Well
TW = Temporary Well
P = Piezometer
TCE = Trichloroethene
RDW = Residential Drinking Water Criteria
NDW = Nonresidential Drinking Water Criteria
GSI = Groundwater Surface Water Interface Criteria

Notes:

1. Groundwater results include concentrations that exceed Groundwater Residential and Nonresidential Part 201 Generic Cleanup Criteria and Screening Levels; Part 213 Tier Risk-Based Screening Levels (RBSLs), September, 2012. Explanations of criteria shown can be found in the Michigan Department of Environmental Quality Footnotes document.
2. Results are expressed in micrograms per liter (ug/L).
3. Locations were not sampled for same parameter list. Refer to Laboratory Reports included in Appendix B and the summary of results provided as Table 3 for more details.
4. The sodium and chloride impacts are not depicted graphically due to their extensive nature.
5. Location of property boundary and Allen Creek are approximate.
6. All locations surveyed by the City of Ann Arbor in 2013.

N

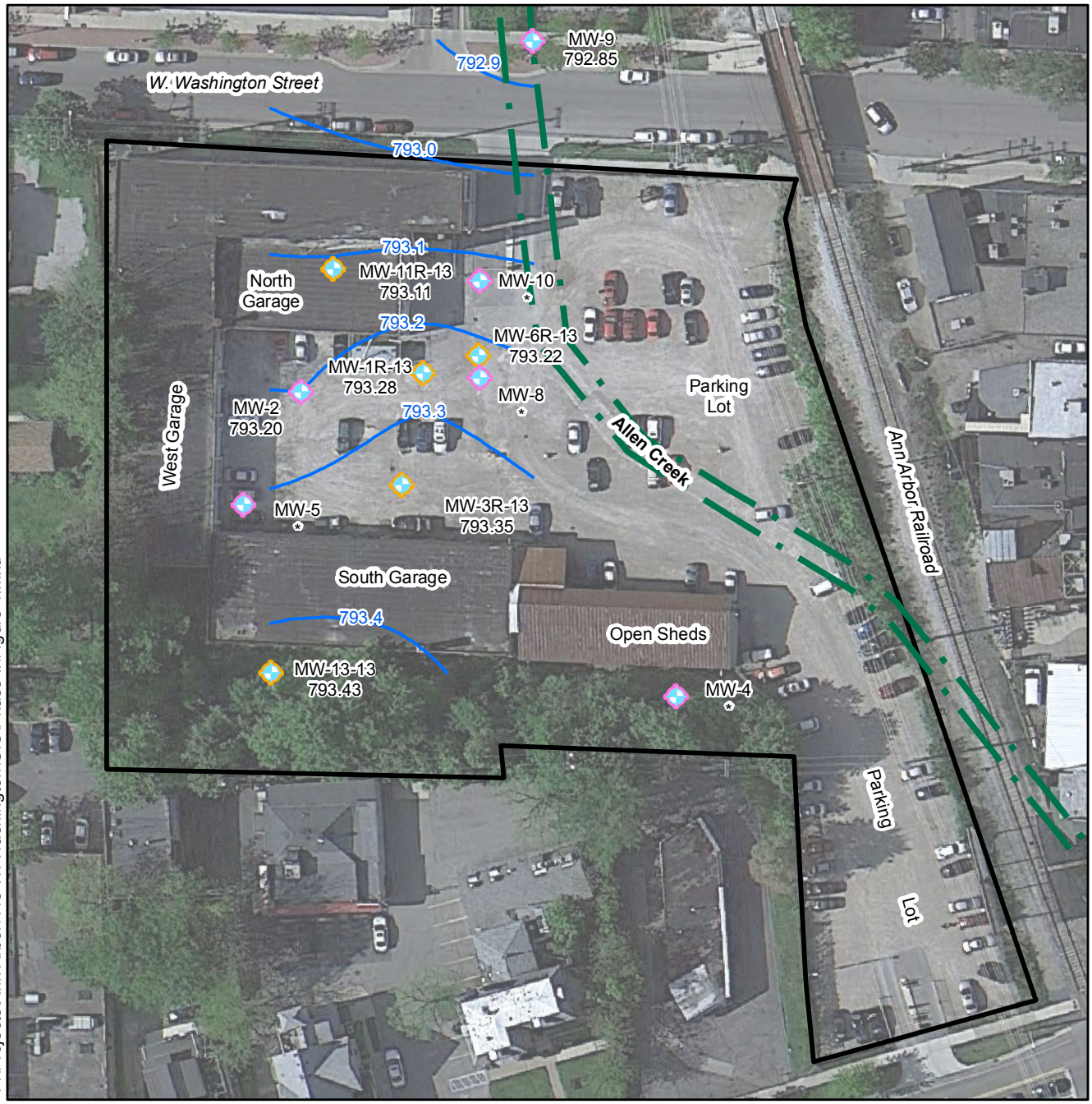
0 70 140 Feet

ORIGINAL BY: A. RAUSS	
DATE: 04/11/2013	
REVISED BY: A. RAUSS	
DATE: 08/15/2013	

415 W. WASHINGTON STREET
PHASE II ESA
ANN ARBOR, MICHIGAN

GROUNDWATER ANALYTICAL RESULTS

FIGURE 3



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BASE MAP: MAY 2010 GOOGLE EARTH IMAGERY

- Previously Existing Monitoring Well (MW)
- 2013 Monitoring Well (MW)
- Allen Creek
- Property Boundary
- Groundwater Elevation Contour

N

0 70 140 Feet

Notes:

1. Survey data for existing monitoring wells were collected by City of Ann Arbor on January 15 and 16, 2013.
2. New wells and soil borings were completed in February 2013. Survey data for new wells were collected by City of Ann Arbor on March 7, 2013.
3. Location of property boundary and Allen Creek are approximate.
4. Contour interval is 0.1 feet.
5. Static water levels used for contouring were collected on March 7, 2013.
6. * Groundwater elevation data was not used for contouring due to screen interval depth, lack of survey data or not measured during March 2013 sampling event.

	ORIGINAL BY: A. RAUSS DATE: 04/16/2013 REVISED BY: A. RAUSS DATE: 06/24/2013	415 W. WASHINGTON STREET PHASE II ESA ANN ARBOR, MICHIGAN GROUNDWATER ELEVATION CONTOUR MAP	FIGURE 4

TABLES

Table 1
Soil Sample Descriptions
415 W. Washington Street - Phase II Environmental Site Assessment
Ann Arbor, Michigan

Sample Name	Date Collected	Sample Depth Below Ground Surface (feet)	Soil Description
MW-6R-13-10'	2/24/2013	10	Medium Sand
MW-6R-13-11'	2/24/2013	11	Peat
MW-13-13-8'	2/24/2013	8	Medium Sand
SB-1-13-2.5'	2/24/2013	2.5	Fine to Medium Sand
SB-1-13-5'	2/24/2013	5	Fine Sand and Silt
SB-3-13-5'	2/24/2013	5	Fine to Medium Sand
SB-5-13-4.5-5'	2/24/2013	4.5 - 5	Fine to Medium Sand
TW-2-13-6'	2/24/2013	6	Fine to Medium Sand

Table 2
Soil Analytical Results
415 W. Washington Street - Phase II Environmental Site Assessment
Ann Arbor, Michigan

Parameter	Method	Matrix	Units	SB-1-13-2.5'	SB-1-13-5'	SB-3-13-5'	SB-5-13-4.5-5'	TW-2-13-6'	MW-6R-13-10'	MW-6R-13-11'	MW-13-13-8'	#10 Statewide Default Background Levels	#11 Residential Drinking Water Protection Criteria & RBSLs	#21 Non-residential Drinking Water Protection Criteria & RBSLs	#12 Groundwater Surface Water Interface Protection Criteria & RBSLs	#13 Groundwater Contact Protection Criteria & RBSLs	#22 Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	#23 Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	#24 Finite VSIC for 5 Meter Source Thickness	#25 Finite VSIC for 2 Meter Source Thickness	#26 Particulate Soil Inhalation Criteria & RBSLs	#27 Direct Contact Criteria & RBSLs	#20 Soil Saturation Concentration Screening Levels
				02/24/13	02/24/13	02/24/13	02/24/13	02/24/13	02/24/13	02/24/13	02/24/13												
Volatile Organic Compounds - Method EPA 8260																							
Acetone	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	84000	2.4E+05	(G)	6.5E+8 (C)	NLV	NLV	NLV	NLV	7.4E+09	4.2E+08	6.5E+08
Benzene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	**280 J**	ND	NA	100	100	4,000 (X)	2.2E+05	8400	45000	99000	2.3E+05	4.7E+08	4.0E+5 (C)	4.0E+05
Bromodichloromethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	1,600 (W)	1,600 (W)	ID	2.8E+05	6400	31000	31000	57000	1.1E+08	4.9E+05	1.5E+06
Bromoform	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	1,600 (W)	1,600 (W)	ID	8.7E+5 (C)	7.7E+05	3.1E+06	3.1E+06	3.1E+06	3.6E+09	8.7E+5 (C)	8.7E+05
Bromomethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	200	580	700	1.4E+06	1600	13000	57000	1.4E+05	1.5E+08	1.0E+06	2.2E+06
2-Butanone (MEK)	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	2.6E+05	7.6E+05	44000	2.7E+7 (C)	2.7E+7 (C)	3.5E+07	3.5E+07	3.6E+07	2.9E+10	2.7E+7 (C,DD)	2.7E+07
Carbon disulfide	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	16000	46000	ID	2.8E+5 (C)	1.4E+05	1.6E+06	8.0E+06	1.9E+07	2.1E+10	2.8E+5 (C,DD)	2.8E+05
Carbon tetrachloride	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	100	100	900 (X)	92000	990	12000	34000	79000	1.7E+08	3.9E+5 (C)	3.9E+05
Chlorobenzene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	2000	2000	500	2.6E+5 (C)	2.2E+05	9.2E+05	1.1E+06	2.1E+06	2.1E+09	2.6E+5 (C)	2.6E+05
Chloroethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	8600	34000	22,000 (X)	9.5E+5 (C)	9.5E+5 (C)	3.6E+07	1.2E+08	2.8E+08	2.9E+11	9.5E+5 (C)	9.5E+05
Chloroform	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	1,600 (W)	1,600 (W)	7000	1.5E+6 (C)	38000	1.5E+05	3.4E+05	7.9E+05	1.6E+09	1.5E+6 (C)	1.5E+06
Chloromethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	5200	22000	ID	1.1E+6 (C)	10000	1.2E+05	1.0E+06	2.5E+06	2.6E+09	1.1E+6 (C)	1.1E+06
Cyclohexane	EPA 8261	Solid	ug/kg	ND	ND	ND	ND	ND	**7,200 J**	**1,700 J**	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
1,2-Dibromo-3-chloropropane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	10 (M); 4.0	10 (M); 4.0	ID	1,200 (C)	1,200 (C)	15000	15000	15000	5.9E+06	1,200 (C)	1200
Dibromochloromethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	1,600 (W)	1,600 (W)	ID	3.6E+05	21000	80000	80000	98000	1.6E+08	5.0E+05	6.1E+05
1,2-Dibromoethane (EDB)	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	20 (M); 1.0	20 (M); 1.0	110 (X)	500	3600	5800	5800	9800	1.8E+07	4.3E+02	8.9E+05
1,2-Dichlorobenzene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	14000	14000	280	2.1E+5 (C)	2.1E+5 (C)	4.6E+07	4.6E+07	5.5E+07	4.4E+10	2.1E+5 (C)	2.1E+05
1,3-Dichlorobenzene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	170	480	680	51000	48000	94000	94000	1.1E+05	8.8E+07	1.7E+5 (C)	1.7E+05
1,4-Dichlorobenzene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	1700	1700	360	1.4E+05	1.0E+05	2.6E+05	2.6E+05	3.4E+05	5.7E+08	1.9E+06	NA
Dichlorodifluoromethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	95000	2.7E+05	ID	1.0E+6 (C)	1.7E+06	6.3E+07	5.5E+08	1.4E+09	1.5E+12	1.0E+6 (C)	1.0E+06
1,1-Dichloroethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	18000	50000	15000	8.9E+5 (C)	4.3E+05	2.5E+06	6.0E+06	1.4E+07	1.5E+10	8.9E+5 (C)	8.9E+05
1,2-Dichloroethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	100	100	7,200 (X)	3.8E+05	11000	21000	33000	74000	1.5E+08	4.2E+05	1.2E+06
1,1-Dichloroethene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	140	140	2600	2.2E+05	330	3700	15000	37000	7.8E+07	5.7E+5 (C)	5.7E+05
cis-1,2-Dichloroethene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	1400	1400	12000	6.4E+5 (C)	41000	2.1E+05	4.3E+05	1.0E+06	1.0E+09	6.4E+5 (C)	6.4E+05
trans-1,2-Dichloroethene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	2000	2000	30,000 (X)	1.4E+6 (C)	43000	3.3E+05	8.4E+05	2.0E+06	2.1E+09	1.4E+6 (C)	1.4E+06
1,2-Dichloropropane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	100	100	4,600 (X)	3.2E+05	7400	30000	51000	1.2E+05	1.2E+08	5.5E+5 (C)	5.5E+05
cis-1,3-Dichloropropene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
trans-1,3-Dichloropropene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Ethylbenzene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	**2,200**	**4,600**	ND	NA	1500	1500	360	1.4E+5 (C)	1.4E+5 (C)	2.4E+06	3.1E+06	6.5E+06	1.3E+10	1.4E+5 (C)	1.4E+05
2-Hexanone	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	20000	58000	ID	2.5E+6 (C)	1.8E+06	1.3E+06	1.3E+06	1.5E+06	1.2E+09	2.5E+6 (C)	2.5E+06
Isopropylbenzene (Cumene)	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	**1,800 J**	**1,500**	ND	NA	91000	2.6E+05	3200	3.9E+5 (C)	3.9E+5 (C)	2.0E+06	2.0E+06	3.0E+06	2.6E+09	3.9E+5 (C)	3.9E+05
Methyl Acetate	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	**410 J**	ND	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Methylcyclohexane	EPA 8262	Solid	ug/kg	ND	ND	ND	ND	ND	**44,000 B**	**16,000 B**	ND	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Methylene Chloride	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	100	100	30,000 (X)	2.3E+6 (C)	2.4E+05	7.0E+05	1.7E+06	4.0E+06	8.3E+09	2.3E+6 (C)	2.3E+06
4-Methyl-2-pentanone (MIBK)	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	36000	1.0E+05	ID	2.7E+6 (C)	2.7E+6 (C)	5.3E+07	5.3E+07	7.0E+07	6.0E+10	2.7E+6 (C)	2.7E+06
Methyl-tert-butyl ether	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	800	800	1.4E+5 (X)	5.9E+6 (C)	5.9E+6 (C)	3.0E+07	4.1E+07	8.9E+07	8.8E+10	5.9E+6 (C)	5.9E+06
Styrene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	2700	2700	2,100 (X)	2.7E+05	5.2E+5 (C)	3.3E+06	3.3E+06	4.2E+06	6.9E+09	5.2E+5 (C)	5.2E+05
1,1,2,2-Tetrachloroethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	170	700	1,600 (X)	94000	23000	34000	34000	34000	6.8E+07	2.4E+05	8.7E+05
Tetrachloroethene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	**68**	ND	ND	ND	NA	100	100	1,200 (X)	88,000 (C)	60000	6.0E+05	1.4E+06	3.3E+06	6.8E+09	88,000 (C)	88000
Toluene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	**580 J**	ND	NA	16000	16000	5400	2.5E+5 (C)	2.5E+5 (C)	3.3E+06	3.6E+07	3.6E+07	1.2E+10	2.5E+5 (C)	2.5E+05
1,2,4-Trichlorobenzene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	4200	4200	5,900 (X)	1.1E+6 (C)	1.1E+6 (C)	3.4E+07	3.4E+07	3.4E+07	1.1E+10	1.1E+6 (C,DD)	1.1E+06
1,1,1-Trichloroethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	4000	4000	1800	4.6E+5 (C)	4.6E+05	4.5E+06	1.5E+07	3.1E+07	2.9E+10	4.6E+5 (C)	4.6E+05
1,1,2-Trichloroethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	100	100	6,600 (X)	4.2E+05	24000	57000	57000	1.2E+05	2.5E+08	8.4E+05	9.2E+05
Trichloroethene	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	**190**	ND	ND	**40 J**	NA	100	100	4,000 (X)	4.4E+05	37000	2.6E+05	4.4E+05	1.1E+06	2.3E+09	5.0E+5 (C,DD)	5.0E+05
Trichlorofluoromethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	52000	1.5E+05	NA	5.6E+5 (C)	5.6E+5 (C)	1.1E+08	1.4E+11	1.4E+11	1.7E+12	5.6E+5 (C)	5.6E+05
1,1,2-Trichlo-1,2,2-Trifluoroethane	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	5.5E+5 (C)	5.5E+5 (C)	1700	5.5E+5 (C)	5.5E+5 (C)	2.1E+08	8.9E+08	2.1E+09	2.3E+12	5.5E+5 (C)	5.5E+05
Vinyl chloride	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	NA	40	40	260 (X)	20000	2800	29000	1.7E+05	4.2E+05	8.9E+08	34000	4.9E+05
Xylenes (Total)	EPA 8260	Solid	ug/kg	ND	ND	ND	ND	ND	**8,800**	**43,000**	ND	NA	5600	5600	820	1.5E+5 (C)	1.5E+5 (C)	5.4E+07	6.5E+07	1.3E+08	1.3E+11	1.5E+5 (C)	1.5E+05

Table 2
Soil Analytical Results
415 W. Washington Street - Phase II Environmental Site Assessment
Ann Arbor, Michigan

Parameter	Method	Matrix	Units	SB-1-13-2.5'	SB-1-13-5'	SB-3-13-5'	SB-5-13-4.5-5'	TW-2-13-6'	MW-6R-13-10'	MW-6R-13-11'	MW-13-13-8'	#10 Statewide Default Background Levels	#11 Residential Drinking Water Protection Criteria & RBSLs	#21 Non-residential Drinking Water Protection Criteria & RBSLs	#12 Groundwater Surface Water Interface Protection Criteria & RBSLs	#13 Groundwater Contact Protection Criteria & RBSLs	#22 Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	#23 Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	#24 Finite VSIC for 5 Meter Source Thickness	#25 Finite VSIC for 2 Meter Source Thickness	#26 Particulate Soil Inhalation Criteria & RBSLs	#27 Direct Contact Criteria & RBSLs	#20 Soil Saturation Concentration Screening Levels
				02/24/13	02/24/13	02/24/13	02/24/13	02/24/13	02/24/13	02/24/13	02/24/13												
Polynuclear Aromatic Hydrocarbons - Analytic Method EPA 8270																							
Acenaphthene	EPA 8270	Solid	ug/kg	**1,400 J**	ND	ND	ND	NA	**32 J**	NA	NA	NA	3.0E+05	8.8E+05	8700	9.7E+05	3.5E+08	9.7E+07	9.7E+07	9.7E+07	6.2E+09	1.3E+08	NA
Acenaphthylene	EPA 8270	Solid	ug/kg	**7,500 J**	**10 J**	ND	ND	NA	ND	NA	NA	NA	5900	17000	ID	4.4E+05	3.0E+06	2.7E+06	2.7E+06	2.7E+06	1.0E+09	5.2E+06	NA
Anthracene	EPA 8270	Solid	ug/kg	**19,000**	**17 J**	ND	**15 J**	NA	**16 J**	NA	NA	NA	41000	41000	ID	41000	1.0E+9 (D)	1.6E+09	1.6E+09	1.6E+09	2.9E+10	7.3E+08	NA
Benzo(a)anthracene	EPA 8270	Solid	ug/kg	**33,000**	**58 J**	ND	**61 J**	NA	**27 J**	NA	NA	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	80000	NA
Benzo(a)pyrene	EPA 8270	Solid	ug/kg	**29,000**	**56 J**	**9.9 J**	**89 J**	NA	**16 J**	NA	NA	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.9E+06	8000	NA
Benzo(b)fluoranthene	EPA 8270	Solid	ug/kg	**35,000**	**89 J**	**20 J**	**120 J**	NA	**16 J**	NA	NA	NA	NLL	NLL	NLL	NLL	ID	ID	ID	ID	ID	80000	NA
Benzo(g,h,i)perylene	EPA 8270	Solid	ug/kg	**10,000 J**	**41 J**	**18 J**	**58 J**	NA	**11 J**	NA	NA	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	3.5E+08	7.0E+06	NA
Benzo(k)fluoranthene	EPA 8270	Solid	ug/kg	**13,000 J**	**19 J**	**6.9 J**	**69 J**	NA	**7.7 J**	NA	NA	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	8.0E+05	NA
Chrysene	EPA 8270	Solid	ug/kg	**30,000**	**59 J**	ND	**94 J**	NA	**21 J**	NA	NA	NA	NLL	NLL	NLL	NLL	ID	ID	ID	ID	ID	8.0E+06	NA
Dibenz(a,h)anthracene	EPA 8270	Solid	ug/kg	**3,800 J**	ND	ND	ND	NA	ND	NA	NA	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	8000	NA
Fluoranthene	EPA 8270	Solid	ug/kg	**66,000**	**100 J**	**11 J**	**95 J**	NA	**48 J**	NA	NA	NA	7.3E+05	7.3E+05	5500	7.3E+05	1.0E+9 (D)	8.9E+08	8.8E+08	8.8E+08	4.1E+09	1.3E+08	NA
Fluorene	EPA 8270	Solid	ug/kg	**8,700 J**	**7.1 J**	ND	ND	NA	**22 J**	NA	NA	NA	3.9E+05	8.9E+05	5300	8.9E+05	1.0E+9 (D)	1.5E+08	1.5E+08	1.5E+08	4.1E+09	8.7E+07	NA
Indeno(1,2,3-cd)pyrene	EPA 8270	Solid	ug/kg	**12,000 J**	**33 J**	**12 J**	ND	NA	**6.3 J**	NA	NA	NA	NLL	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	80000	NA
2-Methylnaphthalene	EPA 8270	Solid	ug/kg	**2,500 J**	**6.7 J**	ND	**12 J**	NA	**3,600**	NA	NA	NA	57000	1.7E+05	4200	5.5E+06	4.9E+06	1.8E+06	1.8E+06	1.8E+06	2.9E+08	2.6E+07	NA
Naphthalene	EPA 8270	Solid	ug/kg	**3,200 J**	**11 J**	ND	ND	NA	**1,700**	NA	NA	NA	35000	1.0E+05	730	2.1E+06	4.7E+05	3.5E+05	3.5E+05	3.5E+05	8.8E+07	5.2E+07	NA
Phenanthrene	EPA 8270	Solid	ug/kg	**63,000**	**63 J**	ND	**42 J**	NA	**48 J**	NA	NA	NA	56000	1.6E+05	2100	1.1E+06	5.1E+06	1.9E+05	1.9E+05	1.9E+05	2.9E+06	5.2E+06	NA
Pyrene	EPA 8270	Solid	ug/kg	**52,000**	**86 J**	**9.5 J**	**95 J**	NA	**41 J**	NA	NA	NA	4.8E+05	4.8E+05	ID	4.8E+05	1.0E+9 (D)	7.8E+08	7.8E+08	7.8E+08	2.9E+09	8.4E+07	NA

NA = not applicable
ug/L & ug/kg = micrograms per liter and micrograms per kilogram
mg/L & mg/kg = milligrams per liter and milligrams per kilogram
EPA = Environmental Protection Agency

ND = non-detect
NLL = not likely to leach
NLV = not likely to volatilize
RBSLs = risk based screening levels

NC = no criteria for the State of Michigan
C = meets cleanup criteria if free phase material is not present
D= calculated criterion exceeds 100 percent

J = result is less than the RL but greater than the MDL and the concentration is an approximate value
ID = insufficient data to develop criteria
M = calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit

Bold = indicates a value above the method detection limit

parameter exceeds criteria

parameters detected above the reporting limit and below criteria

Notes:

Table refects analytical data comparison to Soil: Residential Part 201 Generic Cleanup Criteria and creening Levels; Part 213 Tier I Risk Based Screening Levels, September 2012.
Number following sample identification indicates sample depth.
Explanations of criteria shown in this table can be found in the Michigan Department of Environmental Quality footnotes document.
For dilution factors, see Laboratory Analytical Reports in Appendix B.

Table 3
Groundwater Monitoring Well Construction and Elevation Data
415 W. Washington Street - Phase II Environmental Site Assessment
Ann Arbor, Michigan

Well	Date Installed	Top of Casing Elevation (feet amsl)	Depth to Water January 15, 2013 (feet)	Total Well Depth January 2013 (feet)	Depth to Water February 2013 (feet)	Depth to Water March 2013 (feet)	March 2013 Groundwater Elevations (feet amsl)	Total Well Depth Boring Log (feet)	Screen Interval (feet)
MW-1	*3/27/1992*	*NM*	*NM*	*NM*	*NM*	*NM*	*NM*	*12*	*7-12*
MW-2	3/27/1992	798.65	5.37	11.64	NM	5.45	793.20	13	8-13
MW-3	*3/27/1992*	*NM*	*NM*	*NM*	*NM*	*NM*	*NM*	*12*	*7-12*
MW-4	6/1/1992	801.62	8.70	14.37	NM	7.96	793.66	14	9-14
MW-5	6/1/1992	798.73	5.37	9.67	NM	5.45	793.28	10	5-10
MW-6/AH-1	6/16/1992	NM	5.81	9.88	NM	NM	NM	10	6-10
MW-7	*7/20/1992*	*NM*	*NM*	*NM*	*NM*	*NM*	*NM*	*14*	*9-14*
MW-8	3/15/1993	798.86	5.57	19.72	NM	5.66	793.20	20	15-20
MW-9	3/18/1993	798.30	5.37	13.36	NM	5.45	792.85	14	9-14
MW-10	11/10/1993	NM	5.02	7.09	NM	NM	NM	9	4-9
MW-11	11/10/1993	NM	5.47	6.31	NM	NM	NM	9.5	4.5-9.5
P-1-5'	4/7/1995	NM	dry	4.44	NM	NM	NM	5	4-5
P-1-10'	4/7/1995	NM	5.37	9.85	NM	NM	NM	10	8-10
P-1-15'	4/7/1995	NM	5.35	14.82	NM	NM	NM	15	13-15
P-1-20'	4/7/1995	NM	5.29	19.41	NM	NM	NM	20	17-19
P-2-5'	4/11/1995	NM	4.10	4.50	NM	NM	NM	5	4-5
P-2-10'	4/11/1995	NM	5.43	9.38	NM	NM	NM	10	8-10
P-2-15'	4/11/1995	NM	5.44	14.81	NM	NM	NM	15	13-15
P-2-20'	4/11/1995	NM	5.46	19.02	NM	NM	NM	20	17-19
P-3-5'	4/12/1995	NM	dry	3.50	NM	NM	NM	5	4-5
P-3-10'	4/12/1995	NM	4.79	8.00	NM	NM	NM	10	8-10
P-3-15'	4/12/1995	NM	5.12	12.49	NM	NM	NM	15	13-15
P-3-20'	4/12/1995	NM	5.02	19.22	NM	NM	NM	20	17-19
TW-1-13	2/24/2013	NM	NA	NA	5.80	NA	NM	12	7-12
TW-2-13	2/24/2013	NM	NA	NA	5.83	NA	NM	12	7-12
MW-1R-13	2/24/2013	798.58	NA	NA	NM	5.30	793.28	12	7-12
MW-3R-13	2/24/2013	799.20	NA	NA	NM	5.85	793.35	11	6-11
MW-6R-13	2/24/2013	798.86	NA	NA	NM	5.64	793.22	14	9-14
MW-11R-13	2/24/2013	798.55	NA	NA	NM	5.44	793.11	14	9-14
MW-13-13	2/24/2013	799.28	NA	NA	NM	5.85	793.43	11	6-11

Notes:
MW = monitoring well
P = piezometer
TW = temporary monitoring well
NA = not applicable
NM = not measured
italics = monitoring wells were not located.
The static water level and total depth were measured on January 16, 2013 for MW-2.

Table 4
Groundwater Analytical Results
415 W. Washington Street - Phase II Environmental Site Assessment
Ann Arbor, Michigan

Parameter	Method	Matrix	Units	MW-1R-13 (7-12')	MW-2 (8-13')	MW-3R-13 (6-11')	MW-4 (9-14')	MW-5 (5-10')	MW-6 (6-10')	MW-6R-13 (9-14')	MW-8 (15-20')	MW-8 (15-20')	MW-9 (9-14')	MW-10 (4-9')	MW-11 (4.5-9.5')	MW-11R-13 (9-14')	MW-13-13 (6-11')	P-3-15' (13-15')	TW-1-13 (7-12')	TW-2-13 (7-12')	#1 Residential Drinking Water Criteria & RBSLs	#2 Non-Residential Drinking Water Criteria & RBSLs	#3 Groundwater Surface Water Interface Criteria & RBSLs	#4 Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	#6 Groundwater Contact Criteria & RBSLs	#7 Water Solubility	#8 Flammability and Explosivity Screening Level	#9 Acute Inhalation Screening Level
				03/07/13	01/16/13	03/07/13	01/15/13	01/15/13	01/16/13	03/07/13	01/15/13	03/07/13	01/16/13	01/16/13	01/16/13	03/07/13	03/07/13	01/16/13	02/24/13	02/24/13									
Field Parameters																												
Temperature	---	Water	^{0}C	5.56	10.26	6.81	11.84	8.46	8.82	7.95	11.12	8.70	8.55	7.50	7.42	10.64	9.46	11.10	7.95	9.44	NA	NA	NA	NA	NA	NA	NA	NA
pH	---	Water	S.U.	8.00	7.09	8.02	6.83	7.22	7.37	7.70	6.89	7.69	7.21	8.28	8.89	7.68	7.82	6.86	7.75	7.77	NA	NA	NA	NA	NA	NA	NA	NA
Specific Conductivity	---	Water	mS/cm	4.08	1.64	2.75	2.65	1.315	14.12	2.54	2.62	2.67	2.56	3.87	5.96	1.71	1.53	2.67	1.33	1.51	NA	NA	NA	NA	NA	NA	NA	NA
Redox	---	Water	mV	-167	57	-238	-108	164	118	-182	30	-66	-131	-72	27	-150	-68	49	51	87	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Oxygen	---	Water	mg/L	0.15	1.68	0.36	0.33	3.11	11.95	0.18	0.34	0.19	0.44	1.41	10.50	0.13	5.83	0.70	3.09	3.24	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	---	Water	NTU	42.0	109	35.1	8.8	1.0	43.6	20.0	14.5	46.8	65.8	97.6	5,200	48.1	36.6	810	139	92.0	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds - Analytical Method: EPA 8260B																												
Acetone (I)	EPA 8260B	Water	ug/L	ND	ND	ND	ND	**4.0 J**	**46**	ND	ND	NT	ND	ND	**1.5 J**	ND	ND	ND	ND	ND	730	2100	1700	1.0E+9 (D,S)	3.1E+07	1.00E+09	15,000,000	1.0E+09 (D)
Benzene (I)	EPA 8260B	Water	ug/L	**46**	ND	ND	ND	ND	**5.4**	ND	ND	NT	ND	ND	ND	**420**	ND	ND	ND	ND	5.0 (A)	5.0 (A)	200 (X)	5600	11000	1.75E+06	68,000	67000
Bromodichloromethane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	80 (A,W)	80 (A,W)	ID	4800	14000	6.74E+06	ID	ID
Bromoform	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	80 (A,W)	80 (A,W)	ID	4.7E+05	1.4E+05	3.10E+06	ID	ID
Bromomethane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	10	29	35	4000	70000	1.45E+07	ID	ID
2-Butanone (MEK) (I)	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	**7.1 J**	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	13000	38000	2200	2.4E+08 (S)	2.4E+08 (S)	2.40E+08	ID	2.4E+08 (S)
Carbon disulfide (I,R)	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	**0.13 J**	ND	ND	NT	ND	ND	**0.22 J**	ND	ND	ND	ND	ND	800	2300	ID	2.5E+05	1.2E+06 (S)	1.19E+06	13,000	ID
Carbon tetrachloride	EPA 8260B	Water	ug/L	ND	ND	ND	ND	**0.62 J**	ND	ND	ND	NT	ND	ND	ND	ND	**1.6 J**	ND	**0.98 J**	**0.83 J**	5.0 (A)	5.0 (A)	45 (X)	370	4600	7.93E+05	ID	96000
Chlorobenzene (I)	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	100 (A)	100 (A)	25	2.1E+05	86000	4.72E+05	160,000	ID
Chloroethane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	430	1700	1,100 (X)	5.7E+06 (S)	4.4E+05	5.74E+06	110,000	ID
Chloroform	EPA 8260B	Water	ug/L	ND	**0.23 J**	ND	ND	**3.2 J**	ND	ND	ND	NT	ND	ND	ND	ND	**7.4**	ND	**3.1 J**	**2.3 J**	80 (A,W)	80 (A,W)	350	28000	1.5E+05	7.92E+06	ID	ID
Chloromethane (I)	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	260	1100	ID	8600	4.9E+05	6.34E+06	36,000	210000
Cyclohexane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	**9.5**	**21**	ND	NT	ND	**0.20 J**	ND	**38**	ND	ND	ND	ND	33000	94,000	NA	1500	2.3E+07 (S)	2.30E+07	NA	ID
1,2-Dibromo-3-chloropropane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	0.2 (A)	0.2 (A)	ID	220	390	1.23E+03	NA	ID
Dibromochloromethane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	80 (A,W)	80 (A,W)	ID	14000	18000	4.20E+06	ID	ID
1,2-Dibromoethane (EDB)	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	0.05 (A)	0.05 (A)	5.7 (X)	2400	25	2.60E+06	NC	NC
1,2-Dichlorobenzene	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	600 (A)	600 (A)	13	1.6E+5 (S)	1.6E+05 (S)	1.56E+05	NA	1.6E+05 (S)
1,3-Dichlorobenzene	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	6.6	19	28	18000	2000	1.11E+05	ID	ID
1,4-Dichlorobenzene	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	75 (A)	75 (A)	17	16000	6400	7.38E+04	NA	ID
Dichlorodifluoromethane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	1700	4800	ID	2.2E+05	3.0E+05 (S)	3.00E+05	ID	ID
1,1-Dichloroethane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	880	2500	740	1.0E+06	2.4E+06	5.06E+06	380,000	ID
1,2-Dichloroethane (I)	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	5.0 (A)	5.0 (A)	360 (X)	9600	19000	8.52E+06	2,500,000	ID
1,1-Dichloroethene (I)	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	7.0 (A)	7.0 (A)	130	200	11000	2.25E+06	97,000	140000
cis-1,2-Dichloroethene	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	70 (A)	70 (A)	620	93000	2.0E+05	3.50E+06	530,000	ID
trans-1,2-Dichloroethene	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	100 (A)	100 (A)	1,500 (X)	85000	2.2E+05	6.30E+06	230,000	ID
1,2-Dichloropropane (I)	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	5.0 (A)	5.0 (A)	230 (X)	16000	16000	2.80E+06	550,000	2.8E+06 (S)
cis-1,3-Dichloropropene	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	NC	NC	NC	NC	NC	NC	NC	NC
trans-1,3-Dichloropropene	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	NC	NC	NC	NC	NC	NC	NC	NC
Ethylbenzene (I)	EPA 8260B	Water	ug/L	**31**	ND	ND	ND	ND	**17**	**12**	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	74 (E)	74 (E)	18	1.1E+05	1.7E+05 (S)	1.69E+05	43,000	1.7E+05 (S)
2-Hexanone	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	1000	2900	ID	4.2E+06	5.2E+06	1.60E+07	NA	ID
Isopropylbenzene	EPA 8260B	Water	ug/L	**11**	ND	**0.18 J**	ND	ND	**1.9**	**2.8**	ND	NT	ND	ND	ND	**24**	ND	ND	ND	ND	800	2300	28	56,000 (S)	56,000 (S)	5.60E+04	29,000	ID
Methyl acetate	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	NC	NC	NC	NC	NC	NC	NC	NC
Methylcyclohexane	EPA 8260B	Water	ug/L	**8.2**	ND	ND	ND	ND	**29**	**56**	ND	NT	ND	**0.19 J**	ND	**12 J**	ND	ND	ND	ND	NC	NC	NC	NC	NC	NC	NC	NC
Methylene chloride	EPA 8260B	Water	ug/L	**4.0 J**	ND	ND	ND	ND	ND	**1.6 J**	ND	NT	ND	ND	ND	**20 J**	**3.5 J**	ND	ND	ND	5.0 (A)	5.0 (A)	1,500 (X)	2.2E+05	2.2E+05	1.70E+07	ID	ID
4-Methyl-2-pentanone (MIBK) (I)	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	**3.2 J**	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	1800	5200	ID	2.0E+07 (S)	1.3E+07	2.00E+07	ID	2.0E+07 (S)
Methyl-tert-butyl ether (MTBE)	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	40 (E)	40 (E)	7,100 (X)	4.7E+07 (S)	6.1E+05	4.68E+07	ID	ID
Styrene	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	100 (A)	100 (A)	80 (X)	1.7E+05	9700	3.10E+05	140,000	3.1E+05 (S)
1,1,2,2-Tetrachloroethane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	8.5	35	78 (X)	12000	4700	2.97E+06	ID	ID
Tetrachloroethene	EPA 8260B	Water	ug/L	ND	**1.1**	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	5.0 (A)	5.0 (A)	60 (X)	25000	12000	2.00E+05	ID	2.0E+05 (S)
Toluene (I)	EPA 8260B	Water	ug/L	**1.0 J**	ND	ND	ND	ND	**2.2**	**1.4**	ND	NT	ND	ND	ND	**4.1 J**	ND	ND	ND	ND	790 (E)	790 (E)	270	5.3E+05 (S)	5.3E+05 (S)	5.26E+05	61,000	ID
1,2,4-Trichlorobenzene	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	70 (A)	70 (A)	99 (X)	3.0E+05 (S)	19000	3.00E+05	NA	3.0E+05 (S)
1,1,1-Trichloroethane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	**18**	ND	ND	ND	NT	ND	ND	ND	ND	**8.3**	ND	**15**	**15**	200 (A)	200 (A)	89	6.6E+05	1.3E+06 (S)	1.33E+06	ID	1.3E+06 (S)
1,1,2-Trichloroethane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	5.0 (A)	5.0 (A)	330 (X)	17000	21000	4.42E+06	NA	ID
Trichloroethene	EPA 8260B	Water	ug/L	ND	**5.3**	**0.47 J**	ND	**110**	ND	ND	ND	NT	ND	ND	ND	ND	**190**	ND	**120**	**130**	5.0 (A)	5.0 (A)	200 (X)	15000	22000	1.10E+06	ID	1.1E+06 (S)
Trichlorofluoromethane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	2600	7300	NA	1.1E+06 (S)	1.1E+06 (S)	1.10E+06	ID	1.1E+06 (S)
1,1,2-Trichloro-1,2,2-trifluoroethane	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	1.7E+5 (S)	1.7E+5 (S)	32	1.7E+05 (S)	1.7E+05 (S)	1.70E+05	ID	1.7E+05 (S)
Vinyl chloride	EPA 8260B	Water	ug/L	ND	ND	ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	2.0 (A)	2.0 (A)	13 (X)	1100	1000	2.76E+06	33,000	ID
Xylenes (I)	EPA 8260B	Water	ug/L	**18**	ND	ND	ND	ND	**91**	**66**	ND	NT	ND	ND	ND	**19 J**	ND	ND	ND	ND	280 (E)	280 (E)	41	1.9E+05 (S)	1.9E+05 (S)	1.86E+05	70,000	1.9E+05 (S)

Table 4
Groundwater Analytical Results
415 W. Washington Street - Phase II Environmental Site Assessment
Ann Arbor, Michigan

Parameter	Method	Matrix	Units	MW-1R-13 (7-12')	MW-2 (8-13')	MW-3R-13 (6-11')	MW-4 (9-14')	MW-5 (5-10')	MW-6 (6-10')	MW-6R-13 (9-14')	MW-8 (15-20')	MW-8 (15-20')	MW-9 (9-14')	MW-10 (4-9')	MW-11 (4.5-9.5')	MW-11R-13 (9-14')	MW-13-13 (6-11')	P-3-15' (13-15')	TW-1-13 (7-12')	TW-2-13 (7-12')	#1 Residential Drinking Water Criteria & RBSLs	#2 Non-Residential Drinking Water Criteria & RBSLs	#3 Groundwater Surface Water Interface Criteria & RBSLs	#4 Residential Groundwater Volatilization to Indoor Air Inhalation Criteria & RBSLs	#6 Groundwater Contact Criteria & RBSLs	#7 Water Solubility	#8 Flammability and Explosivity Screening Level	#9 Acute Inhalation Screening Level
				03/07/13	01/16/13	03/07/13	01/15/13	01/15/13	01/16/13	03/07/13	01/15/13	03/07/13	01/16/13	01/16/13	01/16/13	03/07/13	03/07/13	01/16/13	02/24/13	02/24/13									
Polynuclear Aromatic Hydrocarbons - Analytical Method: EPA 8270C																												
Acenaphthene	EPA 8270C	Water	ug/L	**0.36 J**	ND	**2.7 J**	ND	ND	NT	ND	ND	NT	ND	ND	NT	**0.60 J**	NT	ND	NT	NT	1300	3,800	38	4,200 (S)	4,200 (S)	4,200 (S)	4,240	ID
Acenaphthylene	EPA 8270C	Water	ug/L	**0.21 J**	ND	**0.59 J**	ND	ND	NT	ND	ND	NT	ND	ND	NT	ND	NT	ND	NT	NT	52	150	ID	3,900 (S)	3,900 (S)	3,900 (S)	3,930	ID
Anthracene	EPA 8270C	Water	ug/L	ND	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	NT	ND	NT	ND	NT	NT	43 (S)	43 (S)	ID	43 (S)	43 (S)	43 (S)	43.4	ID
Benzo(a)anthracene	EPA 8270C	Water	ug/L	ND	**0.17 J**	ND	ND	ND	NT	ND	ND	NT	ND	**0.11 J**	NT	ND	NT	**0.24 J**	NT	NT	2.1	8.5	ID	NLV	9.4 (S, AA)	9.4 (S,AA)	9.4	ID
Benzo(a)pyrene	EPA 8270C	Water	ug/L	ND	**0.64 J**	ND	ND	ND	NT	ND	ND	NT	ND	**0.62 J**	NT	ND	NT	**0.71 J**	NT	NT	5.0 (A)	5.0 (A)	ID	NLV	1.0 (M, AA); 0.64	1.0 (M,AA); 0.64	1.62	ID
Benzo(b)fluoranthene	EPA 8270C	Water	ug/L	ND	**0.52 J**	ND	ND	ND	NT	ND	ND	NT	ND	**0.50 J**	NT	ND	NT	**0.66 J**	NT	NT	1.5 (S,AA)	1.5 (S,AA)	ID	ID	1.5 (S, AA)	1.5 (S,AA)	1.5	ID
Benzo(g,h,i)perylene	EPA 8270C	Water	ug/L	ND	**0.15 J**	ND	ND	ND	NT	ND	ND	NT	ND	**0.14 J**	NT	ND	NT	**0.20 J**	NT	NT	1.0 (M); 0.26 (S)	1.0 (M); 0.26 (S)	ID	NLV	1.0 (M, AA); 0.26 (S)	1.0 (M,AA); 0.26 (S)	0.26	ID
Benzo(k)fluoranthene	EPA 8270C	Water	ug/L	ND	**0.10 J**	ND	ND	ND	NT	ND	ND	NT	ND	ND	NT	ND	NT	**0.13 J**	NT	NT	1.0 (M); 0.8 (S)	1.0 (M); 0.8 (S)	NA	NLV	1.0 (M, AA); 0.8 (S)	1.0 (M,AA); 0.8 (S)	0.8	ID
Chrysene	EPA 8270C	Water	ug/L	ND	**0.15 J**	ND	ND	ND	NT	ND	ND	NT	ND	**0.19 J**	NT	ND	NT	**0.22 J**	NT	NT	1.6 (S)	1.6 (S)	ID	ID	1.6 (S, AA)	1.6 (S,AA)	1.6	ID
Dibenz(a,h)anthracene	EPA 8270C	Water	ug/L	ND	ND	ND	ND	ND	NT	ND	ND	NT	ND	ND	NT	ND	NT	ND	NT	NT	2.0 (M); 0.21	2.0 (M); 0.85	ID	NLV	2.0 (M, AA); 0.31	2.0 (M,AA); 0.31	2.49	ID
Fluoranthene	EPA 8270C	Water	ug/L	**0.23 J**	**0.24 J**	ND	ND	ND	NT	ND	ND	NT	ND	**0.46 J**	NT	ND	NT	**0.36 J**	NT	NT	210 (S)	210 (S)	1.6	210 (S)	210 (S)	210 (S)	206	ID
Fluorene	EPA 8270C	Water	ug/L	**1.1 J**	ND	**3.5 J**	ND	ND	NT	ND	ND	NT	ND	ND	NT	ND	NT	ND	NT	NT	880	2,000 (S)	12	2,000 (S)	2, 000 (S)	2,000 (S)	1,980	ID
Indeno(1,2,3-cd)pyrene	EPA 8270C	Water	ug/L	ND	**0.64 J**	ND	ND	ND	NT	ND	ND	NT	ND	**0.60 J**	NT	ND	NT	**0.68 J**	NT	NT	2.0 (M); 0.022 (S)	2.0 (M); 0.022 (S)	ID	NLV	2.0 (M, AA); 0.022 (S)	2.0 (M,AA); 0.022 (S)	0.022	ID
2-Methylnaphthalene	EPA 8270C	Water	ug/L	**1.8 J**	ND	ND	ND	ND	NT	**4.3 J**	ND	NT	ND	ND	NT	**2.5 J**	NT	ND	NT	NT	260	750	19	25,000 (S)	25,000 (S)	25,000 (S)	24,600	ID
Naphthalene	EPA 8270C	Water	ug/L	**4.6 J**	ND	ND	ND	ND	NT	7.4	ND	NT	ND	ND	NT	48	NT	ND	NT	NT	520	1,500	11	31,000 (S)	31,000 (S)	31,000 (S)	31,000	NA
Phenanthrene	EPA 8270C	Water	ug/L	**1.2 J**	ND	2.3	ND	ND	NT	ND	ND	NT	ND	**0.13 J**	NT	ND	NT	**0.11 J**	NT	NT	52	150	2.0 (M); 1.4	1,000 (S)	1,000 (S)	1,000 (S)	1,000	ID
Pyrene	EPA 8270C	Water	ug/L	**0.16 J**	**0.20 J**	ND	ND	ND	NT	ND	ND	NT	ND	**0.30 J**	NT	ND	NT	**0.29 J**	NT	NT	140 (S)	140 (S)	ID	140 (S)	140 (S)	140 (S)	135	ID
Metals-Dissolved - Analytical Method: EPA 6020																												
Silver	EPA 6020	Water	ug/L	NT	ND	NT	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	NT	ND	NT	NT	34	98	0.2 (M); 0.06	NLV	1.50E+06	NA	ID	ID
Arsenic	EPA 6020	Water	ug/L	NT	ND	NT	ND	ND	NT	ND	ND	NT	ND	**1.6**	**1.8**	NT	NT	ND	NT	NT	10 (A)	10 (A)	10	NLV	4300	NA	ID	ID
Barium	EPA 6020	Water	ug/L	NT	**77**	NT	**110**	**46**	NT	**120**	**140**	NT	**180**	**69**	**41**	NT	NT	**95**	NT	NT	2000 (A)	2000 (A)	1.10E+03	NLV	1.40E+07	NA	ID	ID
Cadmium	EPA 6020	Water	ug/L	NT	ND	NT	ND	ND	NT	ND	ND	NT	ND	ND	ND	NT	NT	ND	NT	NT	5.0 (A)	5.0 (A)	(G, X)	NLV	1.90E+05	NA	ID	ID
Chromium	EPA 6020	Water	ug/L	NT	**0.84 J**	NT	**0.66 J**	**1.1 J**	NT	**0.73 J**	**0.94 J**	NT	**0.79 J**	**1.3 J**	**1.1 J**	NT	NT	**0.92 J**	NT	NT	100 (A)	100 (A)	11	NLV	4.60E+05	NA	ID	ID
Sodium	EPA 6020	Water	ug/L	NT	**180,000**	NT	**300,000**	**140,000**	NT	**330,000**	**270,000**	NT	**280,000**	**630,000**	NA	NT	NT	**330,000**	NT	NT	1.20E+05	3.50E+05	NA	NLV	1.0E+09 (D)	NA	ID	ID
Nickel	EPA 6020	Water	ug/L	NT	ND	NT	ND	ND	NT	**0.40 J**	ND	NT	**0.22 J**	**0.97 J**	**3.8**	NT	NT	**0.44 J**	NT	NT	100 (A)	100 (A)	1.10E+02	NLV	7.40E+07	NA	ID	ID
Lead	EPA 6020	Water	ug/L	NT	**0.020 J**	NT	**0.027 J**	ND	NT	**0.57 J**	**0.17 J**	NT	ND	**0.096 J**	**0.14 J**	NT	NT	**0.029 J**	NT	NT	4.0 (L)	4.0 (L)	(G, X)	NLV	ID	NA	ID	ID
Selenium (B)	EPA 6020	Water	ug/L	NT	**1.0 J**	NT	ND	**1.6 J**	NT	**0.80 J**	ND	NT	ND	ND	ND	NT	NT	ND	NT	NT	50 (A)	50 (A)	5	NLV	9.70E+05	NA	ID	ID
Zinc	EPA 6020	Water	ug/L	NT	**3.8 J**	NT	**120**	**17**	NT	**4.2 J**	**1,500**	NT	**34**	**230**	**21**	NT	NT	**3.4 J**	NT	NT	2400	5000 (E)	2.40E+02	NLV	1.10E+08	NA	ID	ID
Mercury-Dissolved - Analytical Method: EPA 7470A																												
Mercury (Total) (B,Z)	EPA 7470A	Water	ug/L	NT	ND	NT	ND	ND	NT	NT	**0.043 J**	ND	ND	ND	ND	NT	NT	ND	NT	NT	2.0 (A)	2.0 (A)	0.0013	56 (S)	56 (S)	56	ID	ID
General Chemistry																												
Chloride	--	Water	ug/L	NT	**360,000**	NT	**680,000**	**260,000**	NT	NT	**610,000**	NT	**610,000**	**1,200,000**	**580,000**	NT	NT	**630,000**	NT	NT	2.5E+05 (E)	2.5E+05 (E)	(FF)	NLV	ID	NA	ID	ID
Polychlorinated Biphenyls - Analytical Method: EPA 8082																												
Aroclor-1016	EPA 8082	Water	ug/L	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.5 (A)	0.5 (A)	0.2 (M); 2.6E-5	45 (S)	3.3 (AA)	44.7	ID	ID
Aroclor-1221	EPA 8082	Water	ug/L	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.5 (A)	0.5 (A)	0.2 (M); 2.6E-5	45 (S)	3.3 (AA)	44.7	ID	ID
Aroclor-1232	EPA 8082	Water	ug/L	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.5 (A)	0.5 (A)	0.2 (M); 2.6E-5	45 (S)	3.3 (AA)	44.7	ID	ID
Aroclor-1242	EPA 8082	Water	ug/L	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.5 (A)	0.5 (A)	0.2 (M); 2.6E-5	45 (S)	3.3 (AA)	44.7	ID	ID
Aroclor-1248	EPA 8082	Water	ug/L	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.5 (A)	0.5 (A)	0.2 (M); 2.6E-5	45 (S)	3.3 (AA)	44.7	ID	ID
Aroclor-1254	EPA 8082	Water	ug/L	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.5 (A)	0.5 (A)	0.2 (M); 2.6E-5	45 (S)	3.3 (AA)	44.7	ID	ID
Aroclor-1260	EPA 8082	Water	ug/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.5 (A)	0.5 (A)	0.2 (M); 2.6E-5	45 (S)	3.3 (AA)	44.7	ID	ID

ND = non-detect
NA = not applicable
ug/L = micrograms per liter
mg/L = milligrams per liter
^{0}C = degrees celcius
mS/cm = microseimens per centimeter
Bold = indicates a value above the method detection Limit

ND = Non-Detect
NLL = Not Likely to Leach
NLV = Not Likely to Volatilize
mS/cm = Microsiemens per centimeter
mV = Millivolts

NC = no criteria for the State of Michigan
C = meets cleanup criteria if free phase material is not present
D = calculated criterion exceeds 100 percent
NTU = nephelometric turbidity units
mV = millivolts
S.U. = standard units

J = result is less than the RL but greater than the MDL and the concentration is an approximate value
ID = insufficient data to develop criteria
M = calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.
RBSLs = risk based screening levels
EPA = Environmental Protection Agency
NT = not tested

parameter exceeds criteria
parameter detected above reporting limits and below criteria

Notes:
Table reflects analytical data comparison to Groundwater: Residential Part 201 Generic Cleanup Criteria and Screening Levels; Part 213 Tier I Risk Based Screening Levels, September 28, 2012.
A detection of mercury was reported in MW-8 on January 15, 2013. MW-8 was resampled on March 7, 2013 to confirm result. The result was nondetect.
Depths following well names indicate screen intervals.
For dilution factors, see Laboratory Analytical Reports in Appendix B.
Dissolved metal samples were field filtered.
Chromium compared to Chromium (VI) criteria.
Explanations of criteria shown in this table can be found in the Michigan Department of Environmental Quality footnotes document.
Monitoring wells shaded in darker blue were installed in February 2013, the lighter blue shading are previously existing monitoring wells.
Groundwater surface interface criteria for barium, nickel and zinc were calculated using hardness values reported by the United States Geological Survey for the Huron River in 2011.

Table 5
Stormwater Analytical Results
415 W. Washington Street - Phase II Environmental Site Assessment
Ann Arbor, Michigan

Parameter	Matrix	Units	STORM WATER-1
			01/16/13
Field Parameters			
Temperature	Water	^{0}C	5.91
pH	Water	S.U.	7.55
Specific Conductivity	Water	mS/cm	0.746
Redox	Water	mV	103
Dissolved Oxygen	Water	mg/L	6.34
Turbidity	Water	NTU	54.7
Volatile Organic Compounds - Analytical Method: EPA 8260B			
Acetone (I)	Water	ug/L	ND
Acrolein (I)	Water	ug/L	NA
Acrylonitrile (I)	Water	ug/L	NA
Benzene (I)	Water	ug/L	ND
Bromobenzene (I)	Water	ug/L	NA
Bromochloromethane	Water	ug/L	NA
Bromodichloromethane	Water	ug/L	ND
Bromoform	Water	ug/L	ND
Bromomethane	Water	ug/L	ND
2-Butanone (MEK) (I)	Water	ug/L	ND
n-Butylbenzene	Water	ug/L	NA
sec-Butylbenzene	Water	ug/L	NA
t-Butylbenzene (I)	Water	ug/L	NA
Carbon disulfide (I,R)	Water	ug/L	ND
Carbon tetrachloride	Water	ug/L	ND
Chlorobenzene (I)	Water	ug/L	ND
Chloroethane	Water	ug/L	ND
2-Chloroethyl vinyl ether	Water	ug/L	NA
Chloroform	Water	ug/L	ND
Chloromethane (I)	Water	ug/L	ND
o-Chlorotoluene (I)	Water	ug/L	NA
4-Chlorotoluene	Water	ug/L	NA
Cyclohexane	Water	ug/L	ND
1,2-Dibromo-3-chloropropane	Water	ug/L	ND
Dibromochloromethane	Water	ug/L	ND
1,2-Dibromoethane (EDB)	Water	ug/L	ND
Dibromomethane	Water	ug/L	NA
1,2-Dichlorobenzene	Water	ug/L	ND
1,3-Dichlorobenzene	Water	ug/L	ND
1,4-Dichlorobenzene	Water	ug/L	ND
trans-1,4-Dichloro-2-butene	Water	ug/L	NA
Dichlorodifluoromethane	Water	ug/L	ND
1,1-Dichloroethane	Water	ug/L	ND
1,2-Dichloroethane (I)	Water	ug/L	ND
1,1-Dichloroethene (I)	Water	ug/L	ND
cis-1,2-Dichloroethene	Water	ug/L	ND
trans-1,2-Dichloroethene	Water	ug/L	ND
1,2-Dichloropropane (I)	Water	ug/L	ND
1,3-Dichloropropane	Water	ug/L	NA
2,2-Dichloropropane	Water	ug/L	NA
1,1-Dichloropropene	Water	ug/L	NA
cis-1,3-Dichloropropene	Water	ug/L	ND
trans-1,3-Dichloropropene	Water	ug/L	ND
Diethyl ether	Water	ug/L	NA
Ethylbenzene (I)	Water	ug/L	ND
2-Hexanone	Water	ug/L	ND
Iodomethane	Water	ug/L	NA
Isopropylbenzene	Water	ug/L	ND
p-Isopropyltoluene	Water	ug/L	NA

Table 5
Stormwater Analytical Results
415 W. Washington Street - Phase II Environmental Site Assessment
Ann Arbor, Michigan

Parameter	Matrix	Units	STORM WATER-1
			01/16/13
Volatile Organic Compounds (Continued) - Analytical Method: EPA 8260B			
Methyl acetate	Water	ug/L	ND
Methylcyclohexane	Water	ug/L	ND
Methylene chloride	Water	ug/L	ND
4-Methyl-2-pentanone (MIBK) (I)	Water	ug/L	ND
Methyl-tert-butyl ether (MTBE)	Water	ug/L	ND
n-Propylbenzene (I)	Water	ug/L	NA
Styrene	Water	ug/L	ND
1,1,1,2-Tetrachloroethane	Water	ug/L	NA
1,1,2,2-Tetrachloroethane	Water	ug/L	ND
Tetrachloroethene	Water	ug/L	ND
Tetrahydrofuran	Water	ug/L	NA
Toluene (I)	Water	ug/L	ND
1,2,4-Trichlorobenzene	Water	ug/L	ND
1,1,1-Trichloroethane	Water	ug/L	ND
1,1,2-Trichloroethane	Water	ug/L	ND
Trichloroethene	Water	ug/L	ND
Trichlorofluoromethane	Water	ug/L	ND
1,2,3-Trichloropropane	Water	ug/L	NA
1,1,2-Trichloro-1,2,2-trifluoroethan	Water	ug/L	ND
1,2,3-Trimethylbenzene	Water	ug/L	NA
1,2,4-Trimethylbenzene (I)	Water	ug/L	NA
1,3,5-Trimethylbenzene (I)	Water	ug/L	NA
Vinyl acetate (I)	Water	ug/L	NA
Vinyl chloride	Water	ug/L	ND
Xylenes (I)	Water	ug/L	ND
Polynuclear Aromatic Hydrocarbons - Analytical Method: EPA 8270C			
Acenaphthene	Water	ug/L	ND
Acenaphthylene	Water	ug/L	ND
Anthracene	Water	ug/L	ND
Benzo(a)anthracene	Water	ug/L	**0.17 J**
Benzo(a)pyrene	Water	ug/L	**0.67 J**
Benzo(b)fluoranthene	Water	ug/L	**0.57 J**
Benzo(g,h,i)perylene	Water	ug/L	ND
Benzo(k)fluoranthene	Water	ug/L	**0.12 J**
Chrysene	Water	ug/L	**0.20 J**
Dibenz(a,h)anthracene	Water	ug/L	ND
Fluoranthene	Water	ug/L	**0.27 J**
Fluorene	Water	ug/L	ND
Indeno(1,2,3-cd)pyrene	Water	ug/L	ND
1-Methylnaphthalene	Water	ug/L	NA
2-Methylnaphthalene	Water	ug/L	ND
Naphthalene	Water	ug/L	ND
Phenanthrene	Water	ug/L	ND
Pyrene	Water	ug/L	**0.24 J**
Metals-Dissolved - Analytical Method: EPA 6020			
Silver	Water	ug/L	ND
Arsenic	Water	ug/L	ND
Barium	Water	ug/L	**39**
Cadmium	Water	ug/L	ND
Chromium	Water	ug/L	**0.61 J**
Sodium	Water	ug/L	**62,000**
Nickel	Water	ug/L	**0.29 J**
Lead	Water	ug/L	**0.13 J**
Selenium (B)	Water	ug/L	**0.67 J**
Zinc	Water	ug/L	**15**

Table 5
Stormwater Analytical Results
415 W. Washington Street - Phase II Environmental Site Assessment
Ann Arbor, Michigan

Parameter	Matrix	Units	STORM WATER-1
			01/16/13
Mercury-Dissolved - Analytical Method: EPA 7470A			
Mercury (Total) (B,Z)	Water	ug/L	ND
General Chemistry			
Chloride	Water	ug/L	**110,000**
Polychlorinated Biphenyls - Analytical Method: EPA 8082			
Aroclor-1016	Water	ug/L	ND
Aroclor-1221	Water	ug/L	ND
Aroclor-1232	Water	ug/L	ND
Aroclor-1242	Water	ug/L	ND
Aroclor-1248	Water	ug/L	ND
Aroclor-1254	Water	ug/L	ND
Aroclor-1260	Water	ug/L	ND

NA = not applicable
ug/L = micrograms per liter
mg/L = milligrams per liter
^{0}C = degrees celcius
mS/cm = microsiemens per centimeter
mV = millivolts
NTU = nephelometric turbidity Unit
S.U. = standard units
J = Result is less than reporting limit (RL) but greater then the method detection limit (MDL) and the concentration is an approximatate value
EPA = Environmental Protection Agency
Bold = indicates a value above the MDL
parameters detected above reporting limit

Notes:
No surface water criteria.
For dilution factors, see Laboratory Analytical Reports in Appendix B.
Dissolved metal samples were field filtered.

APPENDICES

APPENDIX A

SOIL BORING AND MONITORING WELL LOGS

Tetra Tech
710 Avis Drive
Ann Arbor, MI 48108
Telephone: (734) 213-2204
Fax: (734) 213-5008

LOG OF: MW-1R-13

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Mike Abernathy**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **CWD**	Checked By: **PJM**
Total Depth **15'** Elev: **NM**	Weather: **Sunny, 26F**	Start Date: **2/24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **3.25"**	PID Model & Lamp eV: **MiniRae 3000 10.6 eV**	Sand Pack Interval: **5.5-12'**	Bentonite Chip Interval: **0.8-5.5'**
Casing (Interval, Diameter, Type): **0-7', 2" PVC**	Hole Abandonment: **na**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **7-12', 2" 10 slot PVC**	Location: **66' S of main bldg/7' E of remedial fence**		

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	WELL LOG	REMARKS
			ASPHALT			0.5	
P-1		60	Light brown, dry, fine to coarse SAND, trace coarse Gravel	2, 4	0.1, 2.5, 1.3	0.8	
P-2		67	Brown, dry, coarse SAND and GRAVEL	6	6.0, 26.1, 6.0	5.5	
			Dark brown, PEAT	8	884.3		
			Dark brown, moist, fine SAND				
			Dark gray, saturated, fine GRAVEL		nm		Oily sheen noted in pore space
P-3		70	Dark gray, wet, fine to medium SAND, little Silt	10, 12	nm	12	
			Light brown, wet, fine to medium SAND, little Silt	14			
			Boring terminated at 15 ft	16, 18, 20			

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Tetra Tech
710 Avis Drive
Ann Arbor, MI 48108
Telephone: (734) 213-2204
Fax: (734) 213-5008

LOG OF: MW-3R-13

(1 of 1)

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Mke Abernathy**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **CWD**	Checked By: **PJM**
Total Depth: **15'** Elev: **NM**	Weather: **Sunny, 26F**	Start Date: **2/24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **3.25"**	PID Model & Lamp eV: **MiniRae 3000 10.6 eV**	Sand Pack Interval: **4.5-11'**	Bentonite Chip Interval: **0.8-4.5'**
Casing (Interval, Diameter, Type): **0-6', 2" PVC**	Hole Abandonment: **na**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **6-11', 2" 10 slot PVC**	Location: **27' N of south garage**		

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	WELL LOG	REMARKS
P-1		63	Gray, dry, fine to coarse SAND and GRAVEL	0.5	0.1	0.5	
			Light brown, moist, fine to medium SAND	0.8	0.3	0.8	
				2	0.1		
				4	0.0	4.5	
P-2		83		6	1.0		
					3.2		
				8	3.9		
			Light brown, saturated, fine to medium SAND		15.2		
			Gray, saturated, fine to medium SAND	10	nm	11	
P-3		100		12	nm		
			Brown, saturated, fine to coarse SAND	14			
			Boring terminated at 15 ft	16			
				18			
				20			

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Tetra Tech
710 Avis Drive
Ann Arbor, MI 48108
Telephone: (734) 213-2204
Fax: (734) 213-5008

LOG OF: MW-6R-13

(1 of 1)

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Mike Abernathy**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **CWD**	Checked By: **PJM**
Total Depth: **14'** Elev: **NM**	Weather: **Sunny, 26F**	Start Date: **2/24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **3.25"**	PID Model & Lamp eV: **MiniRae 3000 10.6 eV**	Sand Pack Interval: **7.5-14'**	Bentonite Chip Interval: **0.8-7.5'**
Casing (Interval, Diameter, Type): **0-9', 2" PVC**	Hole Abandonment: **na**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **9-14', 2" 10 slot PVC**	Location: **59' S of main bldg/31' E of remedial fence**		

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	WELL LOG	REMARKS
P-1		70	Brown, dry, fill, fine to medium SAND with Gravel and Wood	0.5			
			Light brown, moist, fine to medium SAND, little Silt	0.8	0.0		
				2			
				4	101.1		
P-2		100	Dark brown, dry, PEAT	6	945.0		7.5
				8			
			Brown, wet, fine to medium SAND, trace coarse Gravel	10	1000.4		
P-3		80	Dark brown, moist, PEAT		450.0		MW-6R-13-10' (soil sample) collected @ 0940
			Brown, saturated, fine to medium SAND, trace Gravel	12	320.0		MW-6R-13-11' (soil sample) collected @ 1130
			Dark gray, wet, fine to coarse SAND, trace Gravel		nm		
			Brown, wet, fine to medium SAND	14			14
			Boring terminated at 14 ft				
				16			
				18			
				20			

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Tetra Tech
710 Avis Drive
Ann Arbor, MI 48108
Telephone: (734) 213-2204
Fax: (734) 213-5008

LOG OF: MW-11R-13

(1 of 1)

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Mike Abernathy**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **CWD**	Checked By: **PJM**
Total Depth: **14'** Elev: **NM**	Weather: **Inside**	Start Date: **2./24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **3.25"**	PID Model & Lamp eV: **MiniRae 3000 10.6 eV**	Sand Pack Interval: **7.5-14'**	Bentonite Chip Interval: **0.8-7.5'**
Casing (Interval, Diameter, Type): **0-9', 2" PVC**	Hole Abandonment: **na**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **9-14', 2" 10 slot PVC**		Location: **Inside north garage**	

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	WELL LOG	REMARKS
			CONCRETE			0.5 / 0.8	
P-1		77	Light brown, dry, fine to medium SAND, little Silt, trace Gravel	2	4.8		
			Black, dry, PEAT		6.8		
			Light brown, dry, CLAY	4	6.0		Orange-red degraded brick paver @ 3'
			Light brown, moist, fine to medium SAND, some Silt		1.6		
P-2		100		6	0.0		
			Dark brown, moist, PEAT		1.7		
			Brown, moist, fine to coarse SAND, some Silt, trace coarse Gravel	8	7.0	7.5	
					2.6		
				10	1.7		
P-3		100			3.0		
			Brown, saturated, fine to coarse SAND, some Silt, trace coarse Gravel	12	nm		
			Boring terminated at 14 ft	14	nm	14	
				16			
				18			
				20			

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Ann Arbor, MI 48108
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LOG OF: MW-13-13

(1 of 1)

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Mike Abernathy**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **CWD**	Checked By: **PJM**
Total Depth: **13'** Elev: **NM**	Weather: **Overcast, 30F**	Start Date: **2/24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **3.25"**	PID Model & Lamp eV: **MiniRae 3000 10.6 eV**	Sand Pack Interval: **4.5-11'**	Bentonite Chip Interval: **0.8-4.5'**
Casing (Interval, Diameter, Type): **0-6', 2" PVC**	Hole Abandonment: **na**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **6-11', 2" 10 slot PVC**	Location: **9' S of south garage/30' E of SW corner**		

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	WELL LOG	REMARKS
P-1		67	Dark brown, moist, TOPSOIL		3.0	0.5	
			Brown, moist, fine to medium SAND, little Silt		2.6	0.8	
				2	3.0		
					1.0		
			Brown, moist, medium SAND	4	1.6	4.5	
P-2		97	Light brown, moist, fine to medium SAND, some Silt	6	1.6		
			Light brown, wet, medium SAND		0.8		
				8	2.3		MW-13-13-8' (soil sample) collected @ 1500
			Light brown, saturated, medium SAND		nm		
P-3		60		10		11	
				12	nm		
			Boring terminated at 13 ft				
				14			
				16			
				18			
				20			

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LOG OF: **SB-1-13**
(1 of 1)

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Jason Shaffer**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **JTG**	Checked By: **PJM**
Total Depth: **5'** Elev: **NM**	Weather: **Sunny, 20-30F**	Start Date: **2/24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **2.25"**	PID Model & Lamp eV: **MiniRae 2000 10.6 eV**	Sand Pack Interval: **na**	Bentonite Chip Interval: **na**
Casing (Interval, Diameter, Type): **na**	Hole Abandonment: **Soil Cuttings**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **na**	Location: **22' N of #72 sign/15' W of fence post of open sheds**		

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	REMARKS
P-1		80	Brown, damp, fine to medium SAND, some coarse Sand, trace Silt	2	0.0	SB-1-13-2.5' (soil sample) collected @ 0905, slight olfactory observation at 2 -3'
			Brown, damp, fine to medium SAND, little Clay, trace Silt		0.0	
			Brown, damp, fine to medium SAND, little coarse Sand, trace Silt	4	0.0	
			Tan, damp, fine to medium SAND, little coarse Sand		0.0	
			Brown, moist, fine SAND and SILT, little Clay	6		SB-1-13-5' (soil sample) collected @ 0908
			Boring terminated at 5 ft			
				8		
				10		
				12		
				14		
				16		
				18		
				20		

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LOG OF: **SB-2-13**
(1 of 1)

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Jason Shaffer**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **JTG**	Checked By: **PJM**
Total Depth: **6'** Elev: **NM**	Weather: **Sunny, 20-30F**	Start Date: **2/24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **2.25"**	PID Model & Lamp eV: **MiniRae 2000 10.6 eV**	Sand Pack Interval: **na**	Bentonite Chip Interval: **na**
Casing (Interval, Diameter, Type): **na**	Hole Abandonment: **Soil Cuttings**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **na**	Location: **9' N of #71 sign/ 4' W of fence post at edge of open sheds**		

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	REMARKS
P-1		98	Brown, damp, fine to medium SAND, trace coarse Sand and Silt		0.0	Not sampled
			Brown, damp, fine to medium SAND, little Clay, trace coarse Sand and Silt	2	0.0	
			Brown, damp, fine to medium SAND, little coarse Sand, trace Silt		0.0	
				4	0.0	
P-2		63	Brown, moist, fine SAND and SILT, some Clay		0.0	
			Boring terminated at 6 ft	6		
				8		
				10		
				12		
				14		
				16		
				18		
				20		

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LOG OF: **SB-3-13**
(1 of 1)

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Jason Shaffer**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **JTG**	Checked By: **PJM**
Total Depth: **6'** Elev: **NM**	Weather: **Sunny, 20-30F**	Start Date: **2/24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **2.25"**	PID Model & Lamp eV: **MiniRae 2000 10.6 eV**	Sand Pack Interval: **na**	Bentonite Chip Interval: **na**
Casing (Interval, Diameter, Type): **na**	Hole Abandonment: **Soil Cuttings**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **na**	Location: **35' directly S of #9 sign/6' N of lamp post/12' W of lamp post**		

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	REMARKS
P-1		90	Tan, damp, fine to medium SAND, some coarse Sand, little Silt and Clay		0.0	
			Brown, damp, fine to medium SAND, little Silt, trace Clay	2	0.0	
			Tanish brown, damp, fine to medium SAND, little coarse Sand and Silt		0.0	
				4	0.0	
P-2		92			0.0	SB-3-13-5' (soil sample) collected @ 1000
			Boring terminated at 6 ft	6	0.0	Brick pieces @ 4 - 6'
				8		
				10		
				12		
				14		
				16		
				18		
				20		

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LOG OF: **SB-4-13**
(1 of 1)

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Jason Shaffer**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **JTG**	Checked By: **PJM**
Total Depth: **6'** Elev: **NM**	Weather: **Sunny, 20-30F**	Start Date: **2/24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **2.25"**	PID Model & Lamp eV: **MiniRae 2000 10.6 eV**	Sand Pack Interval: **na**	Bentonite Chip Interval: **na**
Casing (Interval, Diameter, Type): **na**	Hole Abandonment: **Cuttings and Bentonite**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **na**	Location: **21' N/22'W of #11 sign**		

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	REMARKS
P-1		73	Grayish tan, damp, fine to medium SAND, trace Silt		0.0	Not sampled
			Brown, damp, fine to medium SAND, some coarse Sand, little Silt	2	0.0	
			Brown, damp , fine to medium SAND, some Clay, little coarse Sand and Silt		0.0	
			Brownish-tan, damp, fine to medium SAND, little coarse Sand and Silt	4	0.0	Brick pieces @ 3'
P-2		75			0.0	
				6	0.0	
			Boring terminated at 6 ft			
				8		
				10		
				12		
				14		
				16		
				18		
				20		

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LOG OF: **SB-5-13**
(1 of 1)

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Jason Shaffer**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **JTG**	Checked By: **PJM**
Total Depth: **6'** Elev: **NM**	Weather: **Cloudy, 20-30F**	Start Date: **2/24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **2.25"**	PID Model & Lamp eV: **MiniRae 2000 10.6 eV**	Sand Pack Interval: **na**	Bentonite Chip Interval: **na**
Casing (Interval, Diameter, Type): **na**	Hole Abandonment: **Cuttings and Bentonite**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **na**	Location: **3' S/3.5' W of MW-10**		

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	REMARKS
P-1		58	ASPHALT Dark brown, damp, fine to coarse SAND, trace Silt Tanish brown, damp to moist, fine to medium SAND, little Silt	2 4	0.0 0.0 0.0	
P-2		100	Brown, moist, fine to medium SAND, trace Silt Brown, wet, fine SAND and SILT, some Clay Brown, saturated, fine to medium SAND, little Silt Dark brown, damp, PEAT Boring terminated at 6 ft	6 8 10 12 14 16 18 20	0.0 0.0	Coal fragments @4.5' SB-5-13-4.5-5' (soil sample) collected @ 1045

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LOG OF: **SB-6-13**
(1 of 1)

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Jason Shaffer**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **JTG**	Checked By: **PJM**
Total Depth: **6'** Elev: **NM**	Weather: **Cloudy, 20-30F**	Start Date: **2/24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **2.25"**	PID Model & Lamp eV: **MiniRae 2000 10.6 eV**	Sand Pack Interval: **na**	Bentonite Chip Interval: **na**
Casing (Interval, Diameter, Type): **na**	Hole Abandonment: **Cuttings and Bentonite**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **na**	Location: **30' S/5' E of #96 sign**		

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	REMARKS
			LIMESTONE GRAVEL			
			Brown, damp, fine to medium SAND, little Silt		0.0	
			2" Silt and Clay lense at 4'	2	0.0	
P-1		75			0.0	Not sampled
				4	0.0	
			Brown, wet, fine to medium SAND, some Silt			Brick pieces @ 4'
P-2		100	Dark brown, damp, PEAT		0.0	
				6	0.0	
			Boring terminated at 6 ft			
				8		
				10		
				12		
				14		
				16		
				18		
				20		

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LOG OF: **TW-1-13**
(1 of 1)

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Jason Shaffer**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **JTG**	Checked By: **PJM**
Total Depth: **12'** Elev: **NM**	Weather: **Cloudy, 20-30F**	Start Date: **2/24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **2.25"**	PID Model & Lamp eV: **MiniRae 2000 10.6 eV**	Sand Pack Interval: **na**	Bentonite Chip Interval: **na**
Casing (Interval, Diameter, Type): **0-5', 1" PVC**	Hole Abandonment: **Bentonite**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **7-12', 1" 10 slot PVC**	Location: **Mower repair garage**		

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	REMARKS
			CONCRETE		0.0	
			Brown, damp, fine to medium SAND			
			Tanish brown, damp, CLAY, little fine Sand and Silt		0.0	Temporary well set @ 12'
P-1		67		2	0.0	
			Brown, damp, fine SAND with Silt, trace coarse Sand			Screen interval 7 - 12'
			Brown, damp, fine to medium SAND, trace Silt	4	0.0	
P-2		75		6	0.0	
			▽ Brown, saturated, fine to medium SAND, trace Silt		nm	
P-3		100		8		
				10	nm	
			Boring terminated at 12 ft	12		
				14		
				16		
				18		
				20		

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LOG OF: **TW-2-13**
(1 of 1)

117-1054011.02

Site: **City of Ann Arbor**		Drilling Company: **Terra Probe**	
Address: **415 W. Washington Street**		Driller: **Jason Shaffer**	
City, State: **Ann Arbor, MI**		Sampling Method: **Macro Core**	
Northing: **NM**	Easting: **NM**	Logged By: **JTG**	Checked By: **PJM**
Total Depth: **12'** Elev: **NM**	Weather: **Inside**	Start Date: **2/24/2013**	Finish Date: **2/24/2013**
Hole Diameter: **2.25"**	PID Model & Lamp eV: **MiniRae 3000 10.6 eV**	Sand Pack Interval: **na**	Bentonite Chip Interval: **na**
Casing (Interval, Diameter, Type): **0-5', 1" PVC**	Hole Abandonment: **Bentonite**	Grout Type & Interval: **na**	
Groundwater Sample Screen (Interval, Diameter, SLOT Size, Type): **7-12', 1" 10 slot PVC**	Location: **South garage**		

Sample Type/No.	Blow Counts	Rec (%)	SOIL DESCRIPTION	Depth (feet)	PID (ppm)	REMARKS
			CONCRETE			
			Tan, damp, fine to medium SAND, trace Silt		0.0	
P-1		71		2	0.0	
					0.0	Temporary well set @ 12'
				4	0.0	Screen interval 7 - 12'
P-2		90		6	0.0	TW-2-13-6' (soil sample) collected @ 1230
			Tan, saturated, fine to medium SAND, trace Silt		nm	
P-3		98		8		
				10	nm	
			Boring terminated at 12 ft	12		
				14		
				16		
				18		
				20		

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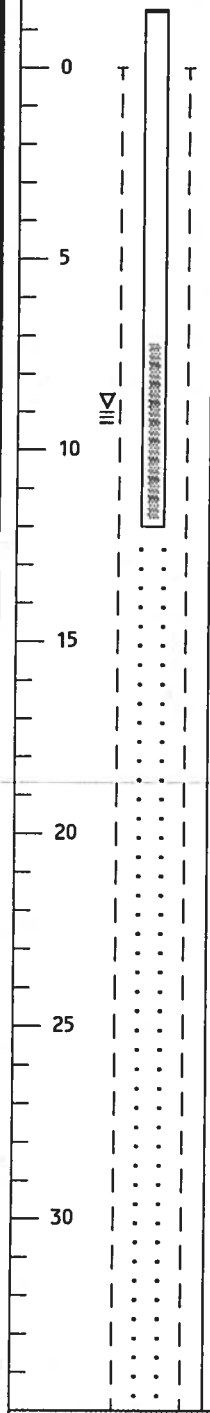
The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Ann Arbor, Michigan 48108

Sheet 1 of 1

PROJECT: West Washington
LOCATION: 415 W.Washington Street
CLIENT: City of Ann Arbor
PROJECT NUMBER: 672B
DRILLER: Libby **HELPER:** J & K
INSTALLATION DATE: 3/27/92

BORING/WELL #: MW-1
SURFACE ELEVATION: N/A
TOP OF CASING ELEV: N/A
STATIC WATER LEVEL: 8'6"
DEVELOPMENT: Bailer
WEATHER: N/A



SAMPLE TYPE	SAMPLING METHOD	DEPTH BELOW GRADE	SOIL DESCRIPTION	SOIL CLASS
		0'3"	Asphalt	
		1'0"	Stones	
Soil	SS	1'-3'	Mixed sand, cinders, and wood fill	
Soil	SS	3'-5' 3'9"		
Soil	SS	5'-7'	Silty sand fill, brown	
		6'9"	Black, peat	
Soil	SS	7'-9' 8'0"	Peat	
		8'6"	Sand and gravel, brown, wet	
Soil	SS	9'-11'		
		10'3"	Brown, medium sand	

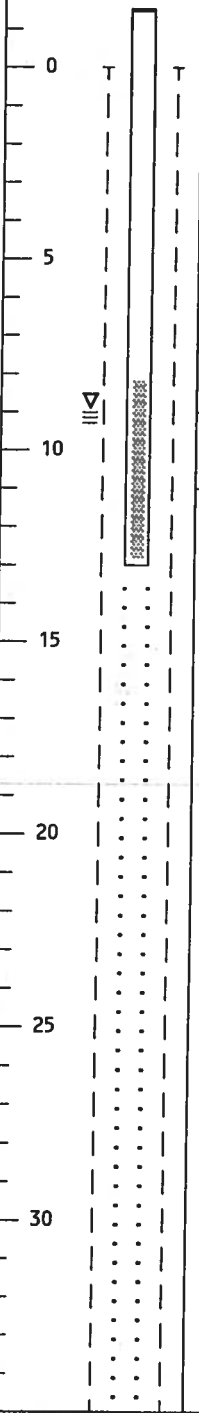
CASING: DIAMETER: 2" **TYPE:** Galvanized **LENGTH:** 10'
SCREEN: DIAMETER: 2" **SLOT:** N/A **TYPE:** Stainless **LENGTH:** 5' **INTERVAL:** 7'-12'
PLUGGING/SEALING METHOD: Cement plug from 0'-4'6", bentonite chips to 6', sand backfill to 12'
COMMENTS:

The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Ann Arbor, Michigan 48108

Sheet 1 of 1

PROJECT: West Washington
LOCATION: 415 W.Washington Street
CLIENT: City of Ann Arbor
PROJECT NUMBER: 672B
DRILLER: Libby **HELPER:** J & K
INSTALLATION DATE: 3/27/92

BORING/WELL #: MW-2
SURFACE ELEVATION: N/A
TOP OF CASING ELEV: N/A
STATIC WATER LEVEL: 9'
DEVELOPMENT: Bailer
WEATHER: N/A



SAMPLE TYPE	SAMPLING METHOD	DEPTH BELOW GRADE	SOIL DESCRIPTION	SOIL CLASS
		0'9"	Asphalt and stones	
		1'0"	Concrete	
Soil	SS	5'-7'	Mixed sand and cinder fill	
		6'6"		
		7'6"	Peat	
Soil	SS	7'-9'	Peat, moist	
		9'0"		
Soil	SS	9'-11'	Medium sand, brown, wet	

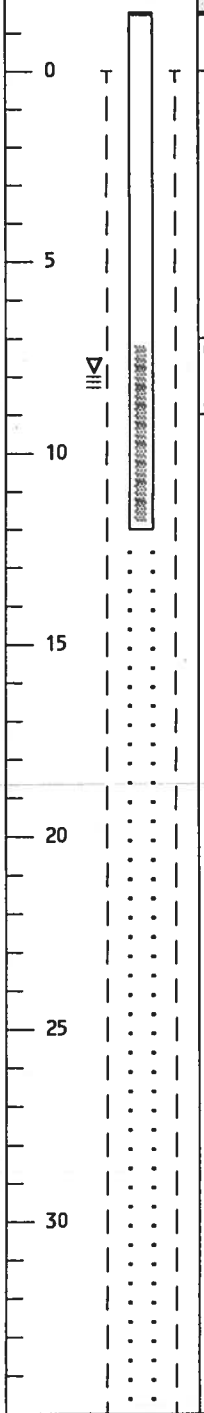
CASING: DIAMETER: 2" **TYPE:** Galvanized **LENGTH:** 10'
SCREEN: DIAMETER: 2" **SLOT:** N/A **TYPE:** Stainless **LENGTH:** 5' **INTERVAL:** 8'-13'
PLUGGING/SEALING METHOD: Cement plug from 0'-4'6", bentonite chips to 7', sand backfill to 13'.
COMMENTS:

The Traverse Group, Inc.
3772 Plaza Drive, Suite 5
Ann Arbor, Michigan 48108

Sheet 1 of 1

PROJECT: West Washington
LOCATION: 415 W.Washington Street
CLIENT: City of Ann Arbor
PROJECT NUMBER: 672B
DRILLER: Libby **HELPER:** J & K
INSTALLATION DATE: 3/27/92

BORING/WELL #: MW-3
SURFACE ELEVATION: N/A
TOP OF CASING ELEV: N/A
STATIC WATER LEVEL: 8'
DEVELOPMENT: Bailer
WEATHER: N/A



SAMPLE TYPE	SAMPLING METHOD	DEPTH BELOW GRADE		SOIL DESCRIPTION	SOIL CLASS
		0'3"		Asphalt	
		1'0"		Concrete	
				Mixed sand and cinder fill	
Soil	SS	7'-9'	8'0"	Medium brown sand, wet	

CASING: DIAMETER: 2" **TYPE:** Galvanized **LENGTH:** 10'
SCREEN: DIAMETER: 2" **SLOT:** N/A **TYPE:** Stainless **LENGTH:** 5' **INTERVAL:** 7'-12'
PLUGGING/SEALING METHOD: Cement plug from 0'-4', bentonite chips to 6', sand backfill to 12'
COMMENTS:

THE TRAVERSE GROUP

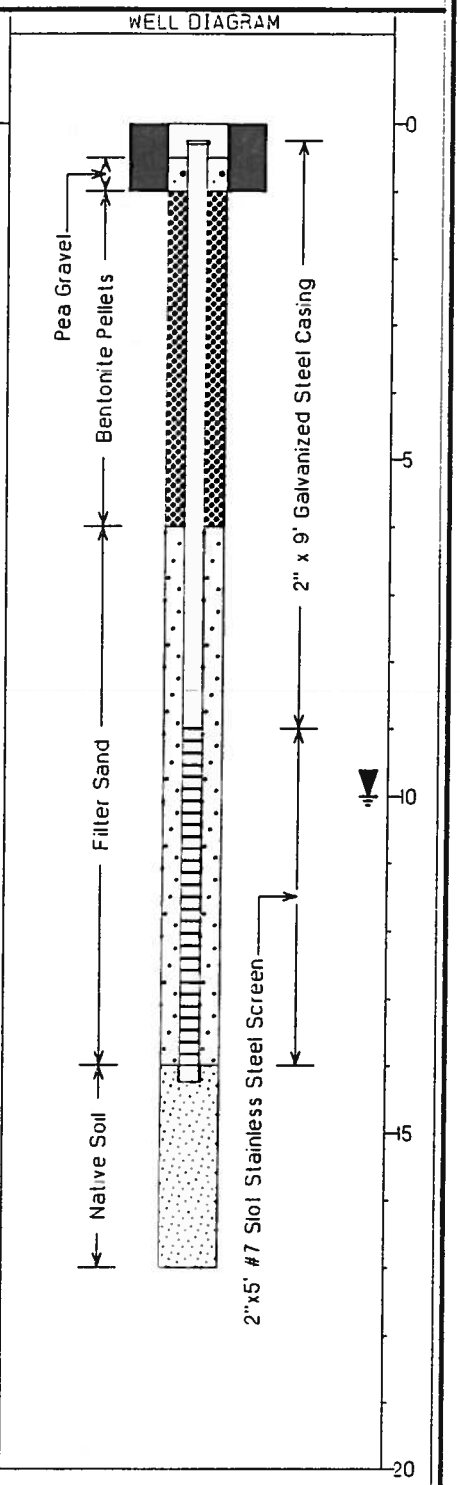
TRAVERSE DRILLING
2525 Aero Park Drive
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

A-4

PROJECT 415 West Washington Street
LOCATION Ann Arbor, Michigan
CLIENT City of Ann Arbor
PROJECT NUMBER 672B
DRILLER Mickey Probst HELPER Joe Harvey
INSTALLATION DATE 6/1/92

BORING/WELL NUMBER MW-4
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION N/A ft.
STATIC WATER LEVEL 10 ft.
DEVELOPMENT METHOD Bailer
WEATHER N/A

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
5		Soil	Split Spoon		
		Soil	Split Spoon		
		Soil	Split Spoon		
10		Soil	Split Spoon		
15					Medium Sand, Brown
20					End of Boring at 17 Feet



Signature _____

THE TRAVERSE GROUP

TRAVERSE DRILLING
2525 Aero Park Drive
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

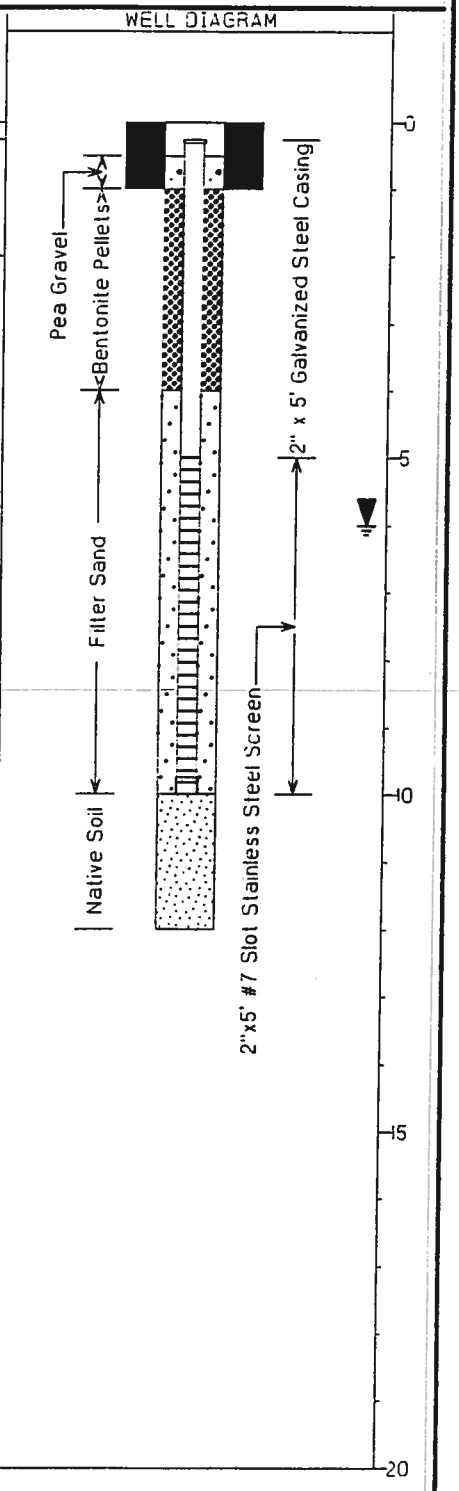
A-5

PROJECT 415 West Washington Street
LOCATION Ann Arbor, Michigan
CLIENT City of Ann Arbor
PROJECT NUMBER 672B
DRILLER Mickey Probst HELPER Joe Harvey
INSTALLATION DATE 6/1/92

BORING/WELL NUMBER MW-5
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION N/A ft.
STATIC WATER LEVEL 6 ft.
DEVELOPMENT METHOD Bailer
WEATHER N/A

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
0					Asphalt
					Concrete
		Soil	Split Spoon		
5		Soil	Split Spoon		
		Soil	Split Spoon		
10					Fine-Medium Sand, Brown-Black
					End of Boring at 12 Feet
15					
20					

WELL DIAGRAM



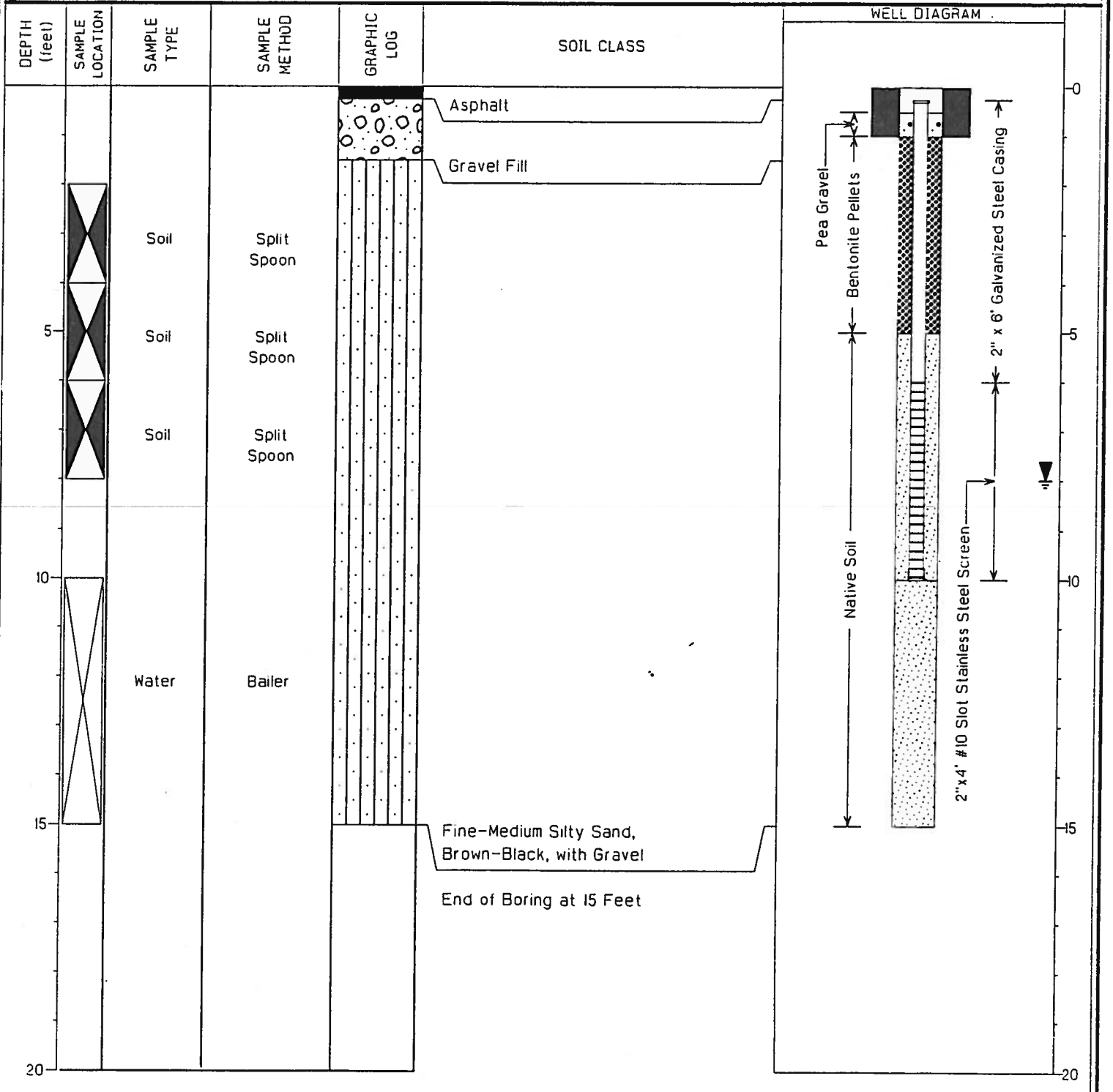
Signature _____

THE TRAVERSE GROUP

TRAVERSE DRILLING
2525 Aero Park Drive
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

PROJECT 415 West Washington Street
LOCATION Ann Arbor, Michigan
CLIENT City of Ann Arbor
PROJECT NUMBER 672B
DRILLER Mark Stover HELPER Mark Leask
INSTALLATION DATE 6/15/92-6/16/92

BORING/WELL NUMBER AH-1/MW-6
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION N/A ft.
STATIC WATER LEVEL 8 ft.
DEVELOPMENT METHOD Bailer
WEATHER Sunny 70°



Signature _____

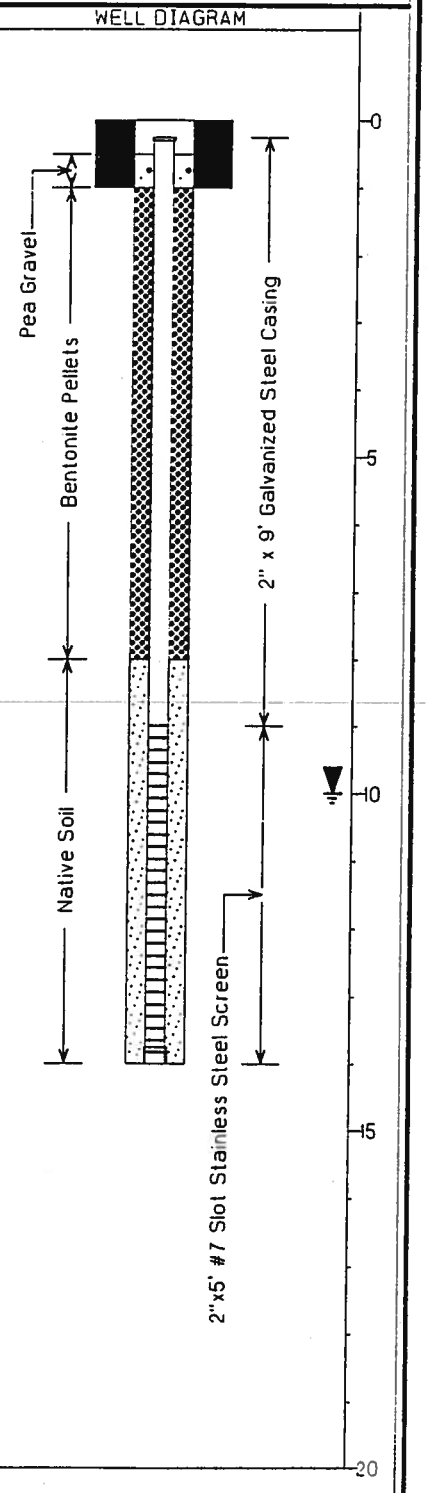
THE TRAVERSE GROUP

TRAVERSE DRILLING
2525 Aero Park Drive
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

PROJECT 415 West Washington Street
LOCATION Ann Arbor, Michigan
CLIENT City of Ann Arbor
PROJECT NUMBER 672B
DRILLER Libby HELPER Don/Jim
INSTALLATION DATE 7/20/92

BORING/WELL NUMBER MW-7
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION N/A ft.
STATIC WATER LEVEL 10 ft.
DEVELOPMENT METHOD Development Pump
WEATHER N/A

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
0					Moist Topsoil, Black
5					Moist Sand Mixed and Cinder Fill
10		Soil	Split Spoon		Moist Organic Clay
		Water	Bailer		Wet Coarse Sand, Brown, with Trace Gravel
15					Wet Medium Sand, Brown, with Trace Gravel
					End of Boring at 14 Feet
20					



Signature

THE TRAVERSE GROUP

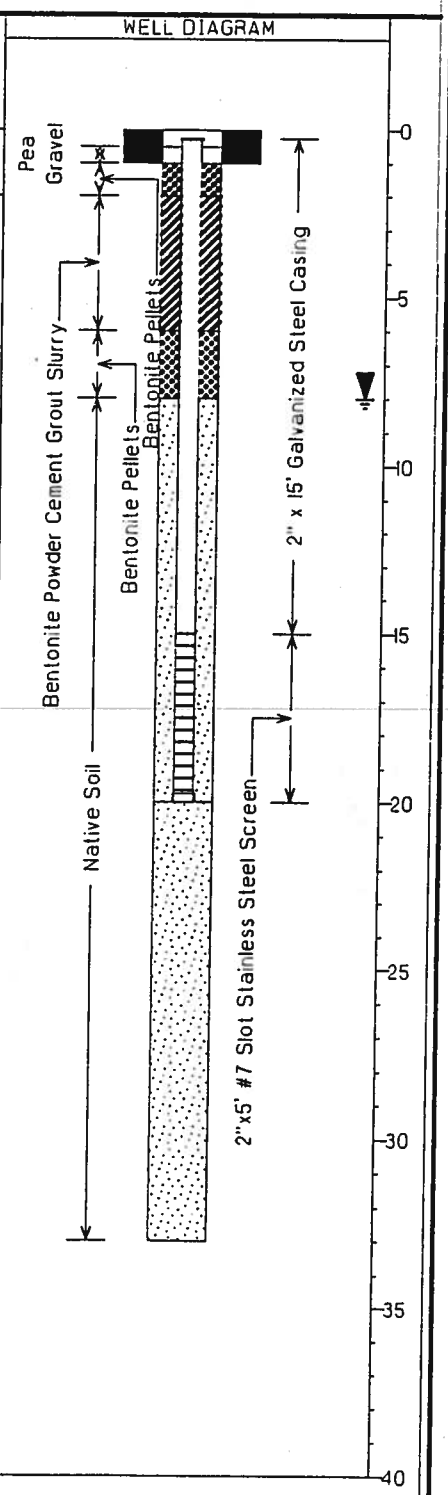
TRAVERSE DRILLING
2525 Aero Park Drive
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

A-21

JJECT 415 West Washington Street
LOCATION Ann Arbor, Michigan
CLIENT City of Ann Arbor
PROJECT NUMBER 6728
DRILLER Mark Leask HELPER Dale Wilson
INSTALLATION DATE 3/15/93

BORING/WELL NUMBER MW-8
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION N/A ft.
STATIC WATER LEVEL 8 ft.
DEVELOPMENT METHOD Development Pump
WEATHER Cloudy 30°

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
5		Soil	Split Spoon		Medium-Coarse Sand, Brown with Fine Gravel
		Soil	Split Spoon		
		Soil	Split Spoon		
10		Water	Bailer		Fine-Medium Silty Sand, Gray
15					
20		Water	Bailer		
25					Wet Medium Silty Sand, Gray
					Wet Medium Silty Sand, Gray, with Gravel
30		Water	Bailer		
35					Wet Medium-Coarse Sand
					End of Boring at 33 Feet
40					



Signature

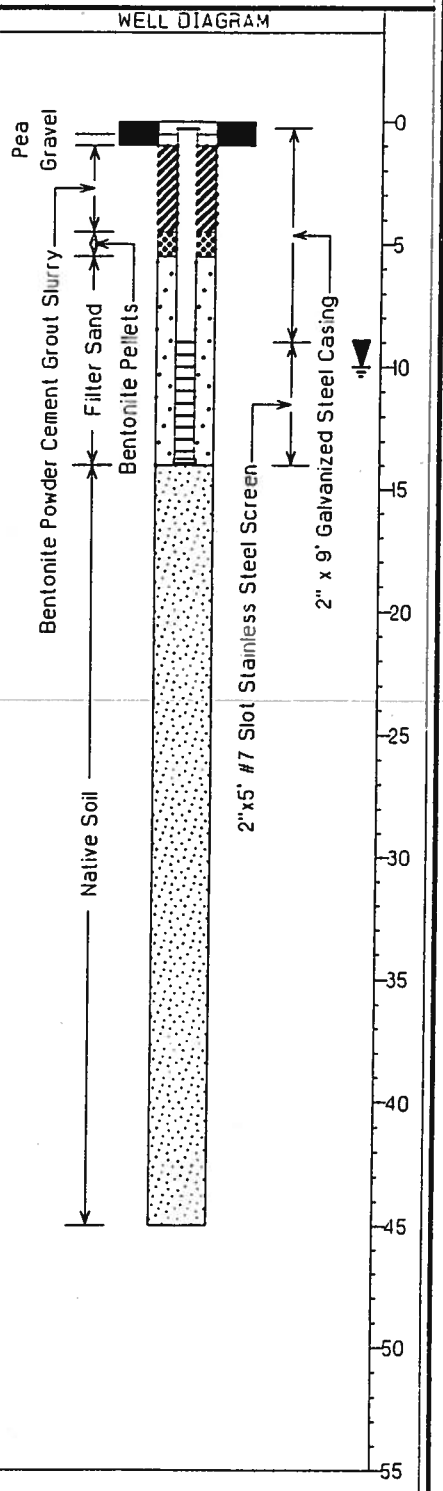
THE TRAVERSE GROUP

TRAVERSE DRILLING
2525 Aero Park Drive
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

JJECT 415 West Washington Street
LOCATION Ann Arbor, Michigan
CLIENT City of Ann Arbor
PROJECT NUMBER 6728
DRILLER John Dupuie HELPER Sam Clark
INSTALLATION DATE 3/18/93

BORING/WELL NUMBER MW-9
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION N/A ft.
STATIC WATER LEVEL 10 ft.
DEVELOPMENT METHOD Development Pump
WEATHER Sunny 25°

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
5		Soil	Split Spoon		Mixed Sand, Gravel, Bricks, Glass, Fill
10		Soil	Split Spoon		
		Soil	Split Spoon		Moist Organics, Black, with Trace Silty Sand
15		Water	Split Spoon Bailer		
20		Water	Bailer		
25					
30		Water	Bailer		
35					
40		Water	Bailer		
45					Wet Fine-Coarse Sand, Brown, with Trace Gravel
50					End of Boring at 45 Feet
55					



Signature

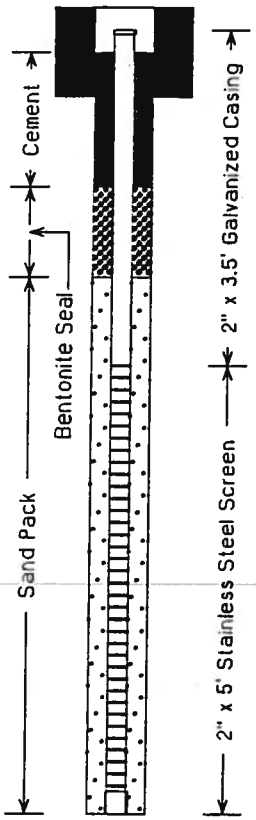
THE TRAVERSE GROUP
3135 Logan Valley Road
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

PROJECT Parks and Recreation Garage
LOCATION 415 West Washington Street
CLIENT City of Ann Arbor
PROJECT NUMBER 93173
DRILLER Paul Libby/CET HELPER Don Bond/CET
INSTALLATION DATE 11/10/93

BORING/WELL NUMBER MW-10
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION 798.53 ft.
STATIC WATER LEVEL Product in Well
DEVELOPMENT METHOD Bailer
WEATHER Clear, 35°

DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
0					Asphalt
3					Mixed Sand and Stone
4					Mixed Sand, Stone, Clay and Brick Debris
5					Medium to Coarse Sand
6		Soil	SS		Peat
7					
8					
9					Coarse Sand
					End of Boring at 9 Feet

WELL DIAGRAM



Signature _____

THE TRAVERSE GROUP

3135 Logan Valley Road
Traverse City, Michigan 49684
(616) 947-2033 FAX: (616) 947-3629

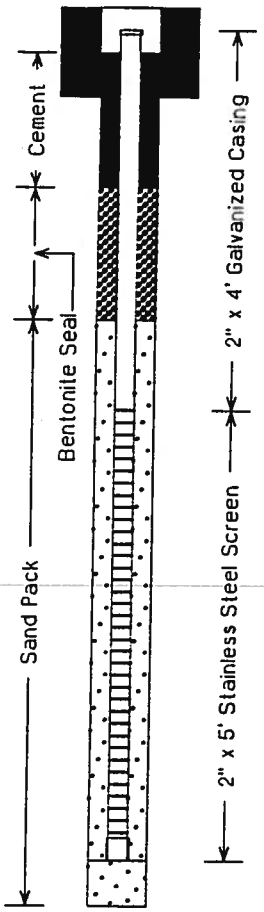
JJECT Parks and Recreation Garage
LOCATION 415 West Washington Street
CLIENT City of Ann Arbor
PROJECT NUMBER 93173
DRILLER Paul Libby/CET HELPER Don Bond/CET
INSTALLATION DATE 11/10/93

BORING/WELL NUMBER MW-11
SURFACE ELEVATION N/A ft.
TOP OF CASING ELEVATION 798.83 ft.
STATIC WATER LEVEL 793.30 ft.
DEVELOPMENT METHOD Bailer
WEATHER Clear, 35°

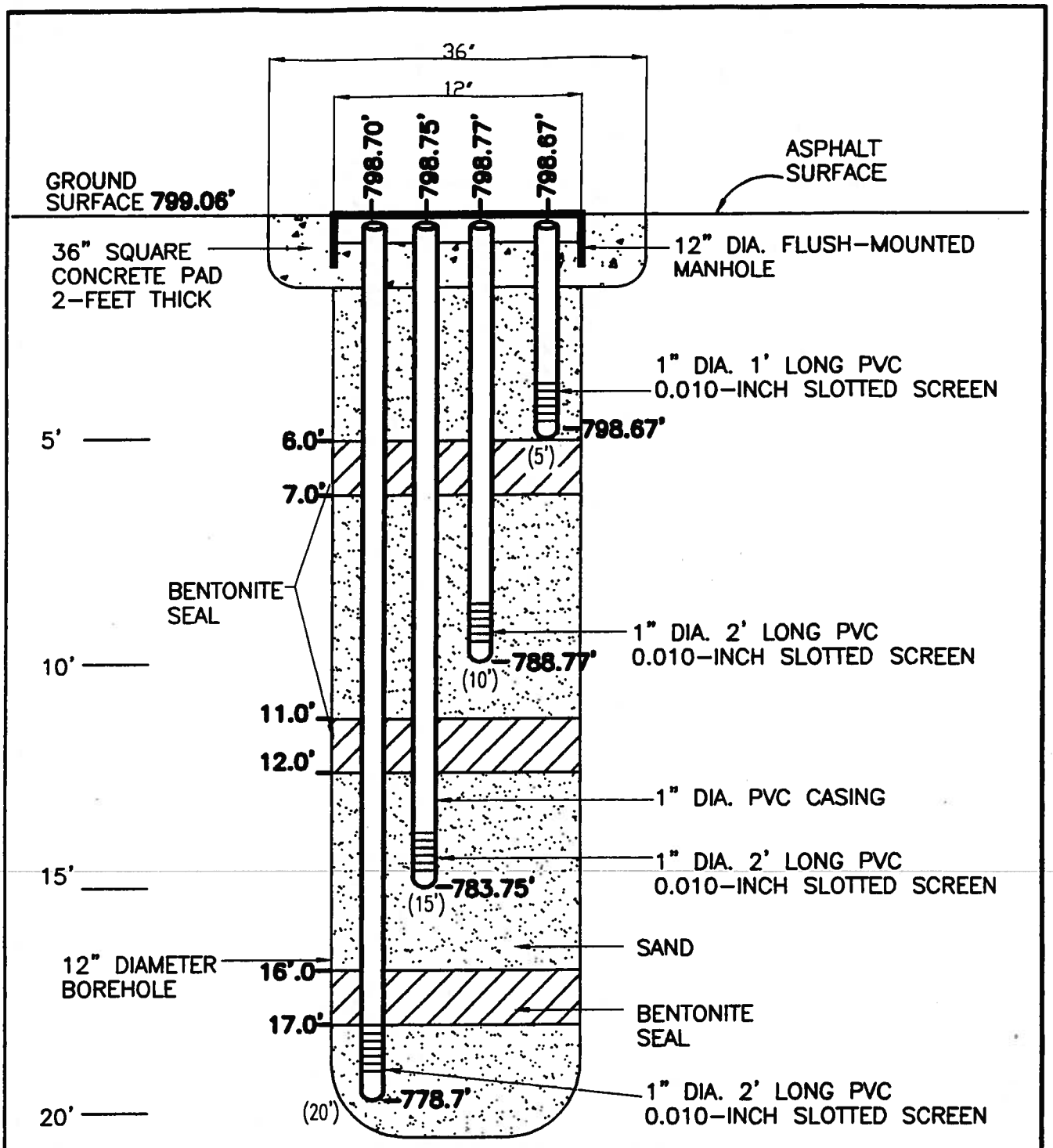
DEPTH (feet)	SAMPLE LOCATION	SAMPLE TYPE	SAMPLE METHOD	GRAPHIC LOG	SOIL CLASS
0-1					Concrete
1-4					Sand and Gravel Fill
5-6		Soil	SS		
6-7					Medium to Coarse Sand, Tan
7-10					Peat
10-15					Medium Sand, Some Silt and Clay

End of Boring at 10 Feet

WELL DIAGRAM



Signature



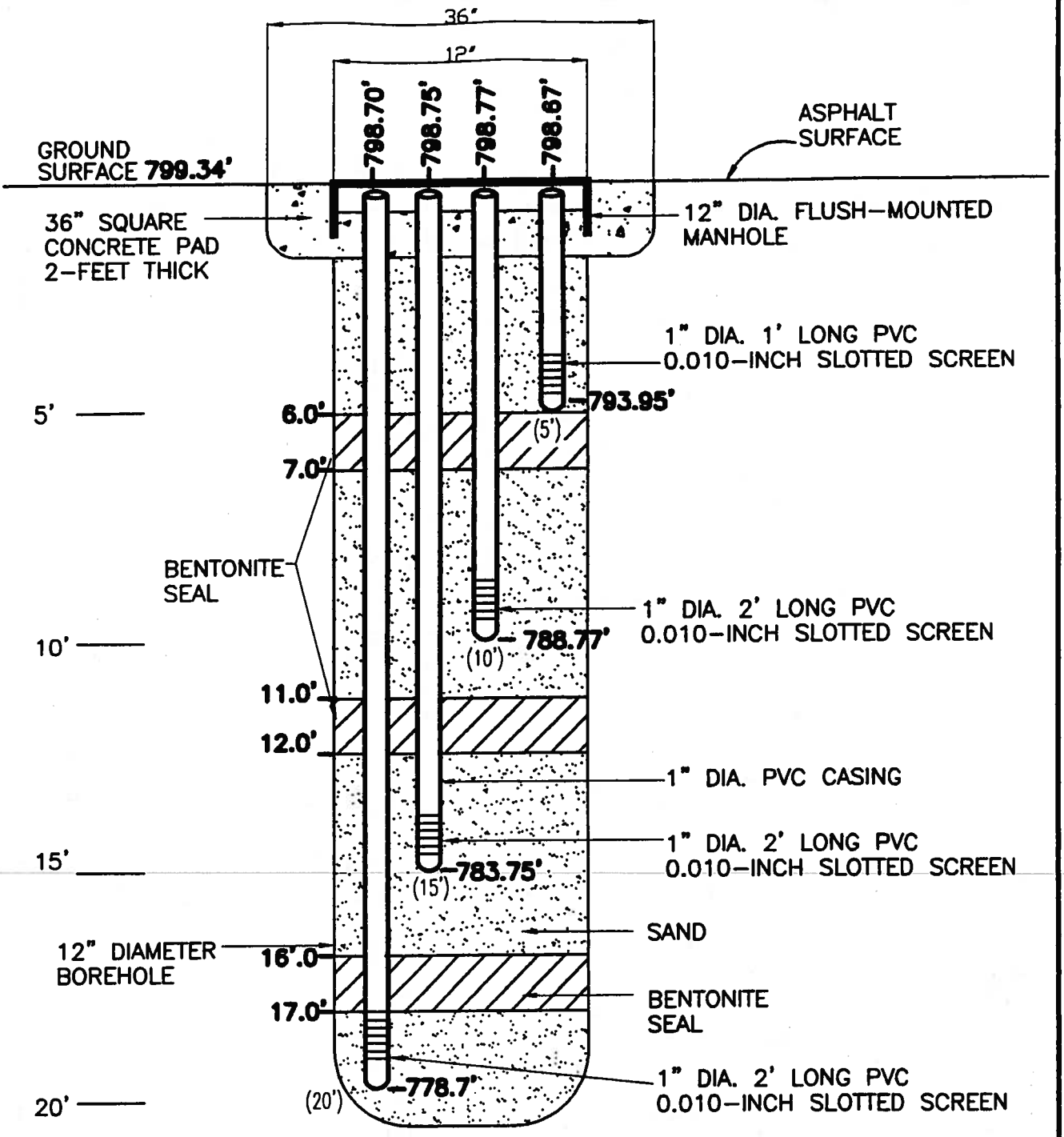
P-1 PIEZOMETER NEST CONSTRUCTION

INSTALLED 4/7/95
415 W. WASHINGTON
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	FIGURE NO.
13-5001-03	KRH	11-01-95	10
SCALE: AS SHOWN	CHECKED BY: CA	SHEET 1 OF 1	

C:\13\500103AA Mon Nov 06 09:02:23 1995 <1>



P-2 PIEZOMETER NEST CONSTRUCTION

INSTALLED 4/11/95
415 W. WASHINGTON
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	FIGURE NO.
13-5001-03	KRH	11-01-95	11
SCALE: AS SHOWN	CHECKED BY: CA	SHEET 1 OF 1	

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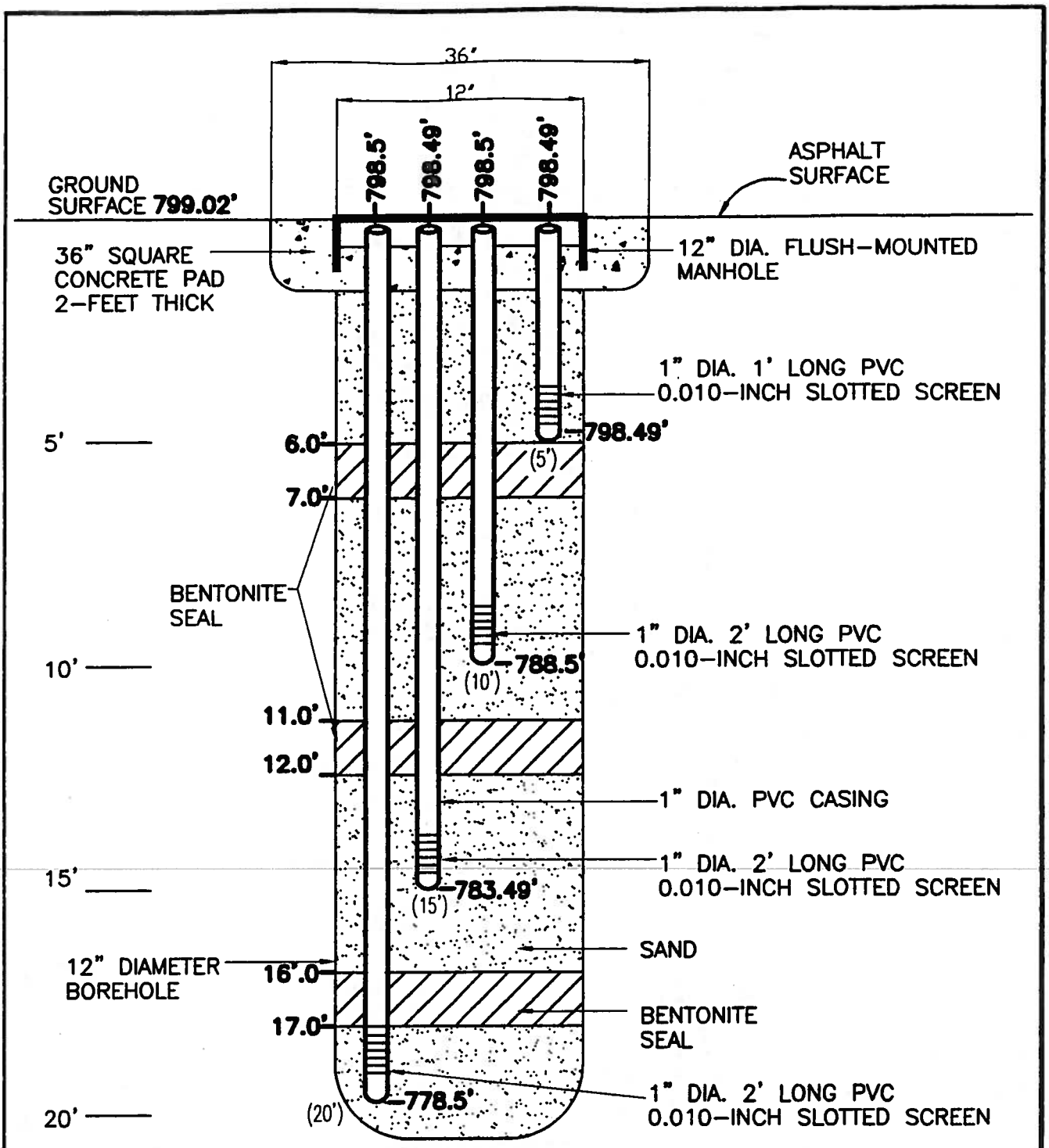

P-3 PIEZOMETER NEST CONSTRUCTION

INSTALLED 4/12/95
415 W. WASHINGTON
ANN ARBOR, MICHIGAN

NTH CONSULTANTS, LTD.
Professional Engineering & Environmental Services
Farmington Hills, Michigan

PROJECT NO.	DRAWN BY:	DATE:	FIGURE NO.
13-5001-03	KRH	11-01-95	12
SCALE: AS SHOWN	CHECKED BY: CA	SHEET 1 OF 1	

C:\13\500103AB Mon Nov 06 09:27:09 1995 <1>

APPENDIX B

GROUNDWATER AND SOIL LABORATORY ANALYTICAL REPORTS

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-20086-1
Client Project/Site: 415 West Washington - 117-1054001/02

For:
Tetra Tech GEO
710 Avis Drive
Ann Arbor, Michigan 48108

Attn: Patti McCall

Authorized for release by:
1/31/2013 4:16:52 PM

Kris Brooks
Project Manager II
kris.brooks@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

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Definitions/Glossary

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 240-20086-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: Tetra Tech GEO

Project: 415 West Washington - 117-1054001/02

Report Number: 240-20086-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

The 6020 Metals and 7470A Mercury analysis were performed at the TestAmerica Pittsburgh Laboratory.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

All parameters were evaluated to the method detection limit and include qualified results where applicable.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 01/18/2013; the samples arrived in good condition, properly preserved and on ice. The temperatures of the coolers at receipt were 2.5, 2.8 and 3.1 C.

The following sample(s) was submitted for analysis; however, it was not listed on the Chain-of-Custody (COC) 20086-8.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples MW-2 (240-20086-1), MW-4 (240-20086-2), MW-5 (240-20086-3), MW-6 (240-20086-4), MW-8 (240-20086-5), MW-9 (240-20086-6), MW-10 (240-20086-7), MW-11 (240-20086-8), P-3-15' (240-20086-9), STORMWATER-1 (240-20086-10) and TRIP BLANK (240-20086-11) were analyzed for volatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 01/22/2013, 01/23/2013 and 01/24/2013.

Methylene Chloride was detected in method blank MB 240-73083/5 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged "J". If the associated sample reported a result above the MDL and/or RL, the result has been "B" flagged. Refer to the QC report for details.

Job ID: 240-20086-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

Sample MW-5 (240-20086-3)[3.33X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The following sample(s) submitted for volatiles analysis was received with insufficient preservation (pH >2): 420M-011613-1105 (240-20105-1), MW-11 (240-20086-8).

No other difficulties were encountered during the VOCs analyses. All other quality control parameters were within the acceptance limits.

SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples MW-2 (240-20086-1), MW-4 (240-20086-2), MW-5 (240-20086-3), MW-8 (240-20086-5), MW-9 (240-20086-6), MW-10 (240-20086-7), P-3-15' (240-20086-9) and STORMWATER-1 (240-20086-10) were analyzed for semivolatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8270C. The samples were prepared on 01/21/2013 and analyzed on 01/23/2013.

Surrogates are added during the extraction process prior to dilution. When the sample is diluted, surrogate recoveries are diluted out and no corrective action is required.

No other difficulties were encountered during the SVOCs analyses. All quality control parameters were within the acceptance limits.

POLYCHLORINATED BIPHENYLS (PCBS)

Samples MW-8 (240-20086-5) and STORMWATER-1 (240-20086-10) were analyzed for polychlorinated biphenyls (PCBs) in accordance with EPA SW-846 Method 8082. The samples were prepared on 01/21/2013 and analyzed on 01/22/2013.

Surrogates are added during the extraction process prior to dilution. When the sample dilution is 5X or greater, surrogate recoveries are diluted out and no corrective action is required.

No other difficulties were encountered during the PCBs analyses. All quality control parameters were within the acceptance limits.

DISSOLVED METALS (ICPMS)

Samples MW-2 (240-20086-1), MW-4 (240-20086-2), MW-5 (240-20086-3), MW-8 (240-20086-5), MW-9 (240-20086-6), MW-10 (240-20086-7), MW-11 (240-20086-8), P-3-15' (240-20086-9) and STORMWATER-1 (240-20086-10) were analyzed for dissolved metals (ICPMS) in accordance with EPA SW-846 Method 6020. The samples were prepared on 01/21/2013 and analyzed on 01/30/2013.

Sodium was detected in method blank MB 180-61561/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged “J”. If the associated sample reported a result above the MDL and/or RL, the result has been “B” flagged. Refer to the QC report for details.

No other difficulties were encountered during the metals analyses. All quality control parameters were within the acceptance limits.

DISSOLVED MERCURY (CVAA)

Samples MW-2 (240-20086-1), MW-4 (240-20086-2), MW-5 (240-20086-3), MW-8 (240-20086-5), MW-9 (240-20086-6), MW-10 (240-20086-7), MW-11 (240-20086-8), P-3-15' (240-20086-9) and STORMWATER-1 (240-20086-10) were analyzed for dissolved mercury (CVAA) in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 01/21/2013.

No difficulties were encountered during the mercury analyses. All quality control parameters were within the acceptance limits.

ANIONS

Samples MW-2 (240-20086-1), MW-4 (240-20086-2), MW-5 (240-20086-3), MW-8 (240-20086-5), MW-9 (240-20086-6), MW-10 (240-20086-7), MW-11 (240-20086-8), P-3-15' (240-20086-9) and STORMWATER-1 (240-20086-10) were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 01/25/2013.

Samples MW-2 (240-20086-1)[5X], MW-4 (240-20086-2)[10X], MW-5 (240-20086-3)[5X], MW-8 (240-20086-5)[10X], MW-9 (240-20086-6)[10X], MW-10 (240-20086-7)[20X], MW-11 (240-20086-8)[20X] and P-3-15' (240-20086-9)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses. All quality control parameters were within the acceptance limits.

Method Summary

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL NC
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL NC
8082	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	TAL NC
6020	Metals (ICP/MS)	SW846	TAL PIT
7470A	Mercury (CVAA)	SW846	TAL PIT
300.0	Anions, Ion Chromatography	MCAWW	TAL NC

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL NC = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-20086-1	MW-2	Water	01/16/13 13:35	01/18/13 09:15
240-20086-2	MW-4	Water	01/15/13 13:10	01/18/13 09:15
240-20086-3	MW-5	Water	01/15/13 12:00	01/18/13 09:15
240-20086-4	MW-6	Water	01/16/13 11:40	01/18/13 09:15
240-20086-5	MW-8	Water	01/15/13 15:18	01/18/13 09:15
240-20086-6	MW-9	Water	01/16/13 10:58	01/18/13 09:15
240-20086-7	MW-10	Water	01/16/13 12:00	01/18/13 09:15
240-20086-8	MW-11	Water	01/16/13 10:00	01/18/13 09:15
240-20086-9	P-3-15'	Water	01/16/13 14:40	01/18/13 09:15
240-20086-10	STORMWATER-1	Water	01/16/13 15:20	01/18/13 09:15
240-20086-11	TRIP BLANK	Water	01/15/13 00:00	01/18/13 09:15

Detection Summary

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-2 — Lab Sample ID: 240-20086-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloroform	0.23	J	1.0	0.16	ug/L	1		8260B	Total/NA
Tetrachloroethene	1.1		1.0	0.29	ug/L	1		8260B	Total/NA
Trichloroethene	5.3		1.0	0.17	ug/L	1		8260B	Total/NA
Benzo[a]anthracene	0.17	J	0.98	0.098	ug/L	1		8270C	Total/NA
Benzo[a]pyrene	0.64	J	0.98	0.098	ug/L	1		8270C	Total/NA
Benzo[b]fluoranthene	0.52	J	0.98	0.098	ug/L	1		8270C	Total/NA
Benzo[g,h,i]perylene	0.15	J	0.98	0.098	ug/L	1		8270C	Total/NA
Benzo[k]fluoranthene	0.10	J	0.98	0.098	ug/L	1		8270C	Total/NA
Chrysene	0.15	J	0.98	0.098	ug/L	1		8270C	Total/NA
Fluoranthene	0.24	J	0.98	0.098	ug/L	1		8270C	Total/NA
Indeno[1,2,3-cd]pyrene	0.64	J	2.0	0.098	ug/L	1		8270C	Total/NA
Pyrene	0.20	J	4.9	0.098	ug/L	1		8270C	Total/NA
Barium	77		10	0.098	ug/L	1		6020	Dissolved
Chromium	0.84	J	2.0	0.54	ug/L	1		6020	Dissolved
Sodium	180000	B	100	3.8	ug/L	1		6020	Dissolved
Lead	0.020	J	1.0	0.019	ug/L	1		6020	Dissolved
Selenium	1.0	J	5.0	0.42	ug/L	1		6020	Dissolved
Zinc	3.8	J	5.0	0.96	ug/L	1		6020	Dissolved
Chloride	360		5.0	0.50	mg/L	5		300.0	Total/NA

Client Sample ID: MW-4 — Lab Sample ID: 240-20086-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	110		10	0.098	ug/L	1		6020	Dissolved
Chromium	0.66	J	2.0	0.54	ug/L	1		6020	Dissolved
Sodium	300000	B	100	3.8	ug/L	1		6020	Dissolved
Lead	0.027	J	1.0	0.019	ug/L	1		6020	Dissolved
Zinc	120		5.0	0.96	ug/L	1		6020	Dissolved
Chloride	680		10	1.0	mg/L	10		300.0	Total/NA

Client Sample ID: MW-5 — Lab Sample ID: 240-20086-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	4.0	J	33	3.7	ug/L	3.33		8260B	Total/NA
Carbon tetrachloride	0.62	J	3.3	0.43	ug/L	3.33		8260B	Total/NA
Chloroform	3.2	J	3.3	0.53	ug/L	3.33		8260B	Total/NA
Trichloroethene	110		3.3	0.57	ug/L	3.33		8260B	Total/NA
1,1,1-Trichloroethane	18		3.3	0.73	ug/L	3.33		8260B	Total/NA
Barium	46		10	0.098	ug/L	1		6020	Dissolved
Chromium	1.1	J	2.0	0.54	ug/L	1		6020	Dissolved
Sodium	140000	B	100	3.8	ug/L	1		6020	Dissolved
Selenium	1.6	J	5.0	0.42	ug/L	1		6020	Dissolved
Zinc	17		5.0	0.96	ug/L	1		6020	Dissolved
Chloride	260		5.0	0.50	mg/L	5		300.0	Total/NA

Client Sample ID: MW-6 — Lab Sample ID: 240-20086-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	46		10	1.1	ug/L	1		8260B	Total/NA
Benzene	5.4		1.0	0.13	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-6 (Continued) — Lab Sample ID: 240-20086-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2-Butanone (MEK)	7.1	J	10	0.57	ug/L	1		8260B	Total/NA
Carbon disulfide	0.13	J	5.0	0.13	ug/L	1		8260B	Total/NA
Ethylbenzene	17		1.0	0.17	ug/L	1		8260B	Total/NA
4-Methyl-2-pentanone (MIBK)	3.2	J	10	0.32	ug/L	1		8260B	Total/NA
Toluene	2.2		1.0	0.13	ug/L	1		8260B	Total/NA
Xylenes, Total	91		2.0	0.28	ug/L	1		8260B	Total/NA
Cyclohexane	9.5		1.0	0.12	ug/L	1		8260B	Total/NA
Isopropylbenzene	1.9		1.0	0.13	ug/L	1		8260B	Total/NA
Methylcyclohexane	29		1.0	0.13	ug/L	1		8260B	Total/NA

Client Sample ID: MW-8 — Lab Sample ID: 240-20086-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	140		10	0.098	ug/L	1		6020	Dissolved
Chromium	0.94	J	2.0	0.54	ug/L	1		6020	Dissolved
Sodium	270000	B	100	3.8	ug/L	1		6020	Dissolved
Lead	0.17	J	1.0	0.019	ug/L	1		6020	Dissolved
Zinc	1500		5.0	0.96	ug/L	1		6020	Dissolved
Mercury	0.043	J	0.20	0.038	ug/L	1		7470A	Dissolved
Chloride	610		10	1.0	mg/L	10		300.0	Total/NA

Client Sample ID: MW-9 — Lab Sample ID: 240-20086-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	180		10	0.098	ug/L	1		6020	Dissolved
Chromium	0.79	J	2.0	0.54	ug/L	1		6020	Dissolved
Sodium	280000	B	100	3.8	ug/L	1		6020	Dissolved
Nickel	0.22	J	1.0	0.17	ug/L	1		6020	Dissolved
Zinc	34		5.0	0.96	ug/L	1		6020	Dissolved
Chloride	610		10	1.0	mg/L	10		300.0	Total/NA

Client Sample ID: MW-10 — Lab Sample ID: 240-20086-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyclohexane	0.20	J	1.0	0.12	ug/L	1		8260B	Total/NA
Methylcyclohexane	0.19	J	1.0	0.13	ug/L	1		8260B	Total/NA
Benzo[a]anthracene	0.11	J	1.0	0.10	ug/L	1		8270C	Total/NA
Benzo[a]pyrene	0.62	J	1.0	0.10	ug/L	1		8270C	Total/NA
Benzo[b]fluoranthene	0.50	J	1.0	0.10	ug/L	1		8270C	Total/NA
Benzo[g,h,i]perylene	0.14	J	1.0	0.10	ug/L	1		8270C	Total/NA
Chrysene	0.19	J	1.0	0.10	ug/L	1		8270C	Total/NA
Fluoranthene	0.46	J	1.0	0.10	ug/L	1		8270C	Total/NA
Indeno[1,2,3-cd]pyrene	0.60	J	2.0	0.10	ug/L	1		8270C	Total/NA
Phenanthrene	0.13	J	2.0	0.10	ug/L	1		8270C	Total/NA
Pyrene	0.30	J	5.0	0.10	ug/L	1		8270C	Total/NA
Arsenic	1.6		1.0	0.29	ug/L	1		6020	Dissolved
Barium	69		10	0.098	ug/L	1		6020	Dissolved
Chromium	1.3	J	2.0	0.54	ug/L	1		6020	Dissolved
Sodium	630000	B	100	3.8	ug/L	1		6020	Dissolved
Nickel	0.97	J	1.0	0.17	ug/L	1		6020	Dissolved

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-10 (Continued) — Lab Sample ID: 240-20086-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lead	0.096	J	1.0	0.019	ug/L	1		6020	Dissolved
Zinc	230		5.0	0.96	ug/L	1		6020	Dissolved
Chloride	1200		20	2.0	mg/L	20		300.0	Total/NA

Client Sample ID: MW-11 — Lab Sample ID: 240-20086-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	1.5	J	10	1.1	ug/L	1		8260B	Total/NA
Carbon disulfide	0.22	J	5.0	0.13	ug/L	1		8260B	Total/NA
Arsenic	1.8		1.0	0.29	ug/L	1		6020	Dissolved
Barium	41		10	0.098	ug/L	1		6020	Dissolved
Chromium	1.1	J	2.0	0.54	ug/L	1		6020	Dissolved
Nickel	3.8		1.0	0.17	ug/L	1		6020	Dissolved
Lead	0.14	J	1.0	0.019	ug/L	1		6020	Dissolved
Zinc	21		5.0	0.96	ug/L	1		6020	Dissolved
Chloride	580		20	2.0	mg/L	20		300.0	Total/NA

Client Sample ID: P-3-15' — Lab Sample ID: 240-20086-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]anthracene	0.24	J	1.0	0.10	ug/L	1		8270C	Total/NA
Benzo[a]pyrene	0.71	J	1.0	0.10	ug/L	1		8270C	Total/NA
Benzo[b]fluoranthene	0.66	J	1.0	0.10	ug/L	1		8270C	Total/NA
Benzo[g,h,i]perylene	0.20	J	1.0	0.10	ug/L	1		8270C	Total/NA
Benzo[k]fluoranthene	0.13	J	1.0	0.10	ug/L	1		8270C	Total/NA
Chrysene	0.22	J	1.0	0.10	ug/L	1		8270C	Total/NA
Fluoranthene	0.36	J	1.0	0.10	ug/L	1		8270C	Total/NA
Indeno[1,2,3-cd]pyrene	0.68	J	2.0	0.10	ug/L	1		8270C	Total/NA
Phenanthrene	0.11	J	2.0	0.10	ug/L	1		8270C	Total/NA
Pyrene	0.29	J	5.0	0.10	ug/L	1		8270C	Total/NA
Barium	95		10	0.098	ug/L	1		6020	Dissolved
Chromium	0.92	J	2.0	0.54	ug/L	1		6020	Dissolved
Sodium	330000	B	100	3.8	ug/L	1		6020	Dissolved
Nickel	0.44	J	1.0	0.17	ug/L	1		6020	Dissolved
Lead	0.029	J	1.0	0.019	ug/L	1		6020	Dissolved
Zinc	3.4	J	5.0	0.96	ug/L	1		6020	Dissolved
Chloride	630		10	1.0	mg/L	10		300.0	Total/NA

Client Sample ID: STORMWATER-1 — Lab Sample ID: 240-20086-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]anthracene	0.17	J	1.0	0.10	ug/L	1		8270C	Total/NA
Benzo[a]pyrene	0.67	J	1.0	0.10	ug/L	1		8270C	Total/NA
Benzo[b]fluoranthene	0.57	J	1.0	0.10	ug/L	1		8270C	Total/NA
Benzo[k]fluoranthene	0.12	J	1.0	0.10	ug/L	1		8270C	Total/NA
Chrysene	0.20	J	1.0	0.10	ug/L	1		8270C	Total/NA
Fluoranthene	0.27	J	1.0	0.10	ug/L	1		8270C	Total/NA
Pyrene	0.24	J	5.1	0.10	ug/L	1		8270C	Total/NA
Barium	39		10	0.098	ug/L	1		6020	Dissolved
Chromium	0.61	J	2.0	0.54	ug/L	1		6020	Dissolved

This Detection Summary does not include radiochemical test results.

Client Sample ID: STORMWATER-1 (Continued)

Lab Sample ID: 240-20086-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sodium	62000	B	100	3.8	ug/L	1		6020	Dissolved
Nickel	0.29	J	1.0	0.17	ug/L	1		6020	Dissolved
Lead	0.13	J	1.0	0.019	ug/L	1		6020	Dissolved
Selenium	0.67	J	5.0	0.42	ug/L	1		6020	Dissolved
Zinc	15		5.0	0.96	ug/L	1		6020	Dissolved
Chloride	110		1.0	0.10	mg/L	1		300.0	Total/NA

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-20086-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	6.2	J	10	1.1	ug/L	1		8260B	Total/NA
Methylene Chloride	0.75	J B	5.0	0.33	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-2
Date Collected: 01/16/13 13:35
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			01/23/13 19:04	1
Benzene	0.13	U	1.0	0.13	ug/L			01/23/13 19:04	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/23/13 19:04	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/23/13 19:04	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/23/13 19:04	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			01/23/13 19:04	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			01/23/13 19:04	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/23/13 19:04	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 19:04	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/23/13 19:04	1
Chloroform	**0.23**	**J**	1.0	0.16	ug/L			01/23/13 19:04	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/23/13 19:04	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/23/13 19:04	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 19:04	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 19:04	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/23/13 19:04	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/23/13 19:04	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/23/13 19:04	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			01/23/13 19:04	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/23/13 19:04	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			01/23/13 19:04	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			01/23/13 19:04	1
Styrene	0.11	U	1.0	0.11	ug/L			01/23/13 19:04	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/23/13 19:04	1
Tetrachloroethene	**1.1**		1.0	0.29	ug/L			01/23/13 19:04	1
Toluene	0.13	U	1.0	0.13	ug/L			01/23/13 19:04	1
Trichloroethene	**5.3**		1.0	0.17	ug/L			01/23/13 19:04	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/23/13 19:04	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			01/23/13 19:04	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 19:04	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/23/13 19:04	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			01/23/13 19:04	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/23/13 19:04	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/23/13 19:04	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/23/13 19:04	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 19:04	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 19:04	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			01/23/13 19:04	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/23/13 19:04	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/23/13 19:04	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/23/13 19:04	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 19:04	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 19:04	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/23/13 19:04	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 19:04	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/23/13 19:04	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/23/13 19:04	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			01/23/13 19:04	1

Client Sample ID: MW-2

Date Collected: 01/16/13 13:35
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-1

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*63 - 129*		*01/23/13 19:04*	*1*
4-Bromofluorobenzene (Surr)	*82*		*66 - 117*		*01/23/13 19:04*	*1*
Toluene-d8 (Surr)	*85*		*74 - 115*		*01/23/13 19:04*	*1*
Dibromofluoromethane (Surr)	*84*		*75 - 121*		*01/23/13 19:04*	*1*

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	**0.17**	**J**	0.98	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Benzo[a]pyrene	**0.64**	**J**	0.98	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Benzo[b]fluoranthene	**0.52**	**J**	0.98	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Benzo[g,h,i]perylene	**0.15**	**J**	0.98	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Benzo[k]fluoranthene	**0.10**	**J**	0.98	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Anthracene	0.098	U	4.9	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Chrysene	**0.15**	**J**	0.98	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Dibenz(a,h)anthracene	0.098	U	2.0	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Fluoranthene	**0.24**	**J**	0.98	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Fluorene	0.098	U	4.9	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Indeno[1,2,3-cd]pyrene	**0.64**	**J**	2.0	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Phenanthrene	0.098	U	2.0	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Pyrene	**0.20**	**J**	4.9	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Acenaphthene	0.098	U	4.9	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Acenaphthylene	0.098	U	4.9	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
Naphthalene	0.098	U	4.9	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1
2-Methylnaphthalene	0.098	U	4.9	0.098	ug/L		01/21/13 11:18	01/23/13 19:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*60*		*20 - 110*	*01/21/13 11:18*	*01/23/13 19:05*	*1*
2-Fluorophenol (Surr)	*73*		*10 - 110*	*01/21/13 11:18*	*01/23/13 19:05*	*1*
2,4,6-Tribromophenol (Surr)	*76*		*21 - 110*	*01/21/13 11:18*	*01/23/13 19:05*	*1*
Nitrobenzene-d5 (Surr)	*63*		*21 - 110*	*01/21/13 11:18*	*01/23/13 19:05*	*1*
Phenol-d5 (Surr)	*76*		*21 - 110*	*01/21/13 11:18*	*01/23/13 19:05*	*1*
Terphenyl-d14 (Surr)	*70*		*24 - 110*	*01/21/13 11:18*	*01/23/13 19:05*	*1*

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.036	U	1.0	0.036	ug/L		01/21/13 13:44	01/30/13 21:10	1
Arsenic	0.29	U	1.0	0.29	ug/L		01/21/13 13:44	01/30/13 21:10	1
Barium	**77**		10	0.098	ug/L		01/21/13 13:44	01/30/13 21:10	1
Cadmium	0.11	U	1.0	0.11	ug/L		01/21/13 13:44	01/30/13 21:10	1
Chromium	**0.84**	**J**	2.0	0.54	ug/L		01/21/13 13:44	01/30/13 21:10	1
Sodium	**180000**	**B**	100	3.8	ug/L		01/21/13 13:44	01/30/13 21:10	1
Nickel	0.17	U	1.0	0.17	ug/L		01/21/13 13:44	01/30/13 21:10	1
Lead	**0.020**	**J**	1.0	0.019	ug/L		01/21/13 13:44	01/30/13 21:10	1
Selenium	**1.0**	**J**	5.0	0.42	ug/L		01/21/13 13:44	01/30/13 21:10	1
Zinc	**3.8**	**J**	5.0	0.96	ug/L		01/21/13 13:44	01/30/13 21:10	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038	U	0.20	0.038	ug/L		01/21/13 11:49	01/21/13 16:34	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-2
Date Collected: 01/16/13 13:35
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-1
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	360		5.0	0.50	mg/L			01/25/13 15:56	5

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-4
Date Collected: 01/15/13 13:10
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			01/23/13 19:26	1
Benzene	0.13	U	1.0	0.13	ug/L			01/23/13 19:26	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/23/13 19:26	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/23/13 19:26	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/23/13 19:26	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			01/23/13 19:26	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			01/23/13 19:26	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/23/13 19:26	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 19:26	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/23/13 19:26	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/23/13 19:26	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/23/13 19:26	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/23/13 19:26	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 19:26	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 19:26	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/23/13 19:26	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/23/13 19:26	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/23/13 19:26	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			01/23/13 19:26	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/23/13 19:26	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			01/23/13 19:26	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			01/23/13 19:26	1
Styrene	0.11	U	1.0	0.11	ug/L			01/23/13 19:26	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/23/13 19:26	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			01/23/13 19:26	1
Toluene	0.13	U	1.0	0.13	ug/L			01/23/13 19:26	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 19:26	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/23/13 19:26	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			01/23/13 19:26	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 19:26	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/23/13 19:26	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			01/23/13 19:26	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/23/13 19:26	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/23/13 19:26	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/23/13 19:26	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 19:26	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 19:26	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			01/23/13 19:26	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/23/13 19:26	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/23/13 19:26	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/23/13 19:26	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 19:26	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 19:26	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/23/13 19:26	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 19:26	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/23/13 19:26	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/23/13 19:26	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			01/23/13 19:26	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-4
Date Collected: 01/15/13 13:10
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-2
Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*63 - 129*		*01/23/13 19:26*	*1*
4-Bromofluorobenzene (Surr)	*89*		*66 - 117*		*01/23/13 19:26*	*1*
Toluene-d8 (Surr)	*85*		*74 - 115*		*01/23/13 19:26*	*1*
Dibromofluoromethane (Surr)	*86*		*75 - 121*		*01/23/13 19:26*	*1*

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	0.096	U	0.96	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Benzo[a]pyrene	0.096	U	0.96	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Benzo[b]fluoranthene	0.096	U	0.96	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Benzo[g,h,i]perylene	0.096	U	0.96	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Benzo[k]fluoranthene	0.096	U	0.96	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Anthracene	0.096	U	4.8	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Chrysene	0.096	U	0.96	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Dibenz(a,h)anthracene	0.096	U	1.9	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Fluoranthene	0.096	U	0.96	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Fluorene	0.096	U	4.8	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Indeno[1,2,3-cd]pyrene	0.096	U	1.9	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Phenanthrene	0.096	U	1.9	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Pyrene	0.096	U	4.8	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Acenaphthene	0.096	U	4.8	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Acenaphthylene	0.096	U	4.8	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
Naphthalene	0.096	U	4.8	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1
2-Methylnaphthalene	0.096	U	4.8	0.096	ug/L		01/21/13 11:18	01/23/13 16:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*57*		*20 - 110*	*01/21/13 11:18*	*01/23/13 16:21*	*1*
2-Fluorophenol (Surr)	*71*		*10 - 110*	*01/21/13 11:18*	*01/23/13 16:21*	*1*
2,4,6-Tribromophenol (Surr)	*83*		*21 - 110*	*01/21/13 11:18*	*01/23/13 16:21*	*1*
Nitrobenzene-d5 (Surr)	*60*		*21 - 110*	*01/21/13 11:18*	*01/23/13 16:21*	*1*
Phenol-d5 (Surr)	*73*		*21 - 110*	*01/21/13 11:18*	*01/23/13 16:21*	*1*
Terphenyl-d14 (Surr)	*73*		*24 - 110*	*01/21/13 11:18*	*01/23/13 16:21*	*1*

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.036	U	1.0	0.036	ug/L		01/21/13 13:44	01/30/13 21:29	1
Arsenic	0.29	U	1.0	0.29	ug/L		01/21/13 13:44	01/30/13 21:29	1
Barium	**110**		10	0.098	ug/L		01/21/13 13:44	01/30/13 21:29	1
Cadmium	0.11	U	1.0	0.11	ug/L		01/21/13 13:44	01/30/13 21:29	1
Chromium	**0.66**	**J**	2.0	0.54	ug/L		01/21/13 13:44	01/30/13 21:29	1
Sodium	**300000**	**B**	100	3.8	ug/L		01/21/13 13:44	01/30/13 21:29	1
Nickel	0.17	U	1.0	0.17	ug/L		01/21/13 13:44	01/30/13 21:29	1
Lead	**0.027**	**J**	1.0	0.019	ug/L		01/21/13 13:44	01/30/13 21:29	1
Selenium	0.42	U	5.0	0.42	ug/L		01/21/13 13:44	01/30/13 21:29	1
Zinc	**120**		5.0	0.96	ug/L		01/21/13 13:44	01/30/13 21:29	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038	U	0.20	0.038	ug/L		01/21/13 11:49	01/21/13 16:36	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-4
Date Collected: 01/15/13 13:10
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-2
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	680		10	1.0	mg/L			01/25/13 16:17	10

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-5
Date Collected: 01/15/13 12:00
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**4.0**	**J**	33	3.7	ug/L			01/23/13 19:49	3.33
Benzene	0.43	U	3.3	0.43	ug/L			01/23/13 19:49	3.33
Bromodichloromethane	0.50	U	3.3	0.50	ug/L			01/23/13 19:49	3.33
Bromoform	2.1	U	3.3	2.1	ug/L			01/23/13 19:49	3.33
Bromomethane	1.4	U	3.3	1.4	ug/L			01/23/13 19:49	3.33
2-Butanone (MEK)	1.9	U	33	1.9	ug/L			01/23/13 19:49	3.33
Carbon disulfide	0.43	U	17	0.43	ug/L			01/23/13 19:49	3.33
Carbon tetrachloride	**0.62**	**J**	3.3	0.43	ug/L			01/23/13 19:49	3.33
Chlorobenzene	0.50	U	3.3	0.50	ug/L			01/23/13 19:49	3.33
Chloroethane	0.97	U	3.3	0.97	ug/L			01/23/13 19:49	3.33
Chloroform	**3.2**	**J**	3.3	0.53	ug/L			01/23/13 19:49	3.33
Chloromethane	1.0	U	3.3	1.0	ug/L			01/23/13 19:49	3.33
1,1-Dichloroethane	0.50	U	3.3	0.50	ug/L			01/23/13 19:49	3.33
1,2-Dichloroethane	0.73	U	3.3	0.73	ug/L			01/23/13 19:49	3.33
1,1-Dichloroethene	0.63	U	3.3	0.63	ug/L			01/23/13 19:49	3.33
1,2-Dichloropropane	0.60	U	3.3	0.60	ug/L			01/23/13 19:49	3.33
cis-1,3-Dichloropropene	0.47	U	3.3	0.47	ug/L			01/23/13 19:49	3.33
trans-1,3-Dichloropropene	0.63	U	3.3	0.63	ug/L			01/23/13 19:49	3.33
Ethylbenzene	0.57	U	3.3	0.57	ug/L			01/23/13 19:49	3.33
2-Hexanone	1.4	U	33	1.4	ug/L			01/23/13 19:49	3.33
Methylene Chloride	1.1	U	17	1.1	ug/L			01/23/13 19:49	3.33
4-Methyl-2-pentanone (MIBK)	1.1	U	33	1.1	ug/L			01/23/13 19:49	3.33
Styrene	0.37	U	3.3	0.37	ug/L			01/23/13 19:49	3.33
1,1,2,2-Tetrachloroethane	0.60	U	3.3	0.60	ug/L			01/23/13 19:49	3.33
Tetrachloroethene	0.97	U	3.3	0.97	ug/L			01/23/13 19:49	3.33
Toluene	0.43	U	3.3	0.43	ug/L			01/23/13 19:49	3.33
Trichloroethene	**110**		3.3	0.57	ug/L			01/23/13 19:49	3.33
Vinyl chloride	0.73	U	3.3	0.73	ug/L			01/23/13 19:49	3.33
Xylenes, Total	0.93	U	6.7	0.93	ug/L			01/23/13 19:49	3.33
1,1,1-Trichloroethane	**18**		3.3	0.73	ug/L			01/23/13 19:49	3.33
1,1,2-Trichloroethane	0.90	U	3.3	0.90	ug/L			01/23/13 19:49	3.33
Cyclohexane	0.40	U	3.3	0.40	ug/L			01/23/13 19:49	3.33
1,2-Dibromo-3-Chloropropane	2.2	U	3.3	2.2	ug/L			01/23/13 19:49	3.33
1,2-Dibromoethane	0.80	U	3.3	0.80	ug/L			01/23/13 19:49	3.33
Dichlorodifluoromethane	1.0	U	3.3	1.0	ug/L			01/23/13 19:49	3.33
cis-1,2-Dichloroethene	0.57	U	3.3	0.57	ug/L			01/23/13 19:49	3.33
trans-1,2-Dichloroethene	0.63	U	3.3	0.63	ug/L			01/23/13 19:49	3.33
Isopropylbenzene	0.43	U	3.3	0.43	ug/L			01/23/13 19:49	3.33
Methyl acetate	1.3	U	33	1.3	ug/L			01/23/13 19:49	3.33
Methyl tert-butyl ether	0.57	U	17	0.57	ug/L			01/23/13 19:49	3.33
1,1,2-Trichloro-1,2,2-trifluoroethane	0.93	U	3.3	0.93	ug/L			01/23/13 19:49	3.33
1,2,4-Trichlorobenzene	0.50	U	3.3	0.50	ug/L			01/23/13 19:49	3.33
1,2-Dichlorobenzene	0.43	U	3.3	0.43	ug/L			01/23/13 19:49	3.33
1,3-Dichlorobenzene	0.47	U	3.3	0.47	ug/L			01/23/13 19:49	3.33
1,4-Dichlorobenzene	0.43	U	3.3	0.43	ug/L			01/23/13 19:49	3.33
Trichlorofluoromethane	0.70	U	3.3	0.70	ug/L			01/23/13 19:49	3.33
Dibromochloromethane	0.60	U	3.3	0.60	ug/L			01/23/13 19:49	3.33
Methylcyclohexane	0.43	U	3.3	0.43	ug/L			01/23/13 19:49	3.33

Client Sample ID: MW-5

Date Collected: 01/15/13 12:00
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-3

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*63 - 129*		*01/23/13 19:49*	*3.33*
4-Bromofluorobenzene (Surr)	*89*		*66 - 117*		*01/23/13 19:49*	*3.33*
Toluene-d8 (Surr)	*85*		*74 - 115*		*01/23/13 19:49*	*3.33*
Dibromofluoromethane (Surr)	*91*		*75 - 121*		*01/23/13 19:49*	*3.33*

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Benzo[a]pyrene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Benzo[b]fluoranthene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Benzo[g,h,i]perylene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Benzo[k]fluoranthene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Anthracene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Chrysene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Dibenz(a,h)anthracene	0.10	U	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Fluoranthene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Fluorene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Indeno[1,2,3-cd]pyrene	0.10	U	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Phenanthrene	0.10	U	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Pyrene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Acenaphthene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Acenaphthylene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
Naphthalene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1
2-Methylnaphthalene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 15:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*61*		*20 - 110*	*01/21/13 11:18*	*01/23/13 15:10*	*1*
2-Fluorophenol (Surr)	*75*		*10 - 110*	*01/21/13 11:18*	*01/23/13 15:10*	*1*
2,4,6-Tribromophenol (Surr)	*80*		*21 - 110*	*01/21/13 11:18*	*01/23/13 15:10*	*1*
Nitrobenzene-d5 (Surr)	*63*		*21 - 110*	*01/21/13 11:18*	*01/23/13 15:10*	*1*
Phenol-d5 (Surr)	*78*		*21 - 110*	*01/21/13 11:18*	*01/23/13 15:10*	*1*
Terphenyl-d14 (Surr)	*70*		*24 - 110*	*01/21/13 11:18*	*01/23/13 15:10*	*1*

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.036	U	1.0	0.036	ug/L		01/21/13 13:44	01/30/13 21:34	1
Arsenic	0.29	U	1.0	0.29	ug/L		01/21/13 13:44	01/30/13 21:34	1
Barium	**46**		10	0.098	ug/L		01/21/13 13:44	01/30/13 21:34	1
Cadmium	0.11	U	1.0	0.11	ug/L		01/21/13 13:44	01/30/13 21:34	1
Chromium	**1.1**	**J**	2.0	0.54	ug/L		01/21/13 13:44	01/30/13 21:34	1
Sodium	**140000**	**B**	100	3.8	ug/L		01/21/13 13:44	01/30/13 21:34	1
Nickel	0.17	U	1.0	0.17	ug/L		01/21/13 13:44	01/30/13 21:34	1
Lead	0.019	U	1.0	0.019	ug/L		01/21/13 13:44	01/30/13 21:34	1
Selenium	**1.6**	**J**	5.0	0.42	ug/L		01/21/13 13:44	01/30/13 21:34	1
Zinc	**17**		5.0	0.96	ug/L		01/21/13 13:44	01/30/13 21:34	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038	U	0.20	0.038	ug/L		01/21/13 11:49	01/21/13 16:41	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-5
Date Collected: 01/15/13 12:00
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-3
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	260		5.0	0.50	mg/L			01/25/13 16:37	5

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-6
Date Collected: 01/16/13 11:40
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**46**		10	1.1	ug/L			01/23/13 20:11	1
Benzene	**5.4**		1.0	0.13	ug/L			01/23/13 20:11	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/23/13 20:11	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/23/13 20:11	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/23/13 20:11	1
2-Butanone (MEK)	**7.1**	**J**	10	0.57	ug/L			01/23/13 20:11	1
Carbon disulfide	**0.13**	**J**	5.0	0.13	ug/L			01/23/13 20:11	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/23/13 20:11	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 20:11	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/23/13 20:11	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/23/13 20:11	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/23/13 20:11	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/23/13 20:11	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 20:11	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 20:11	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/23/13 20:11	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/23/13 20:11	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/23/13 20:11	1
Ethylbenzene	**17**		1.0	0.17	ug/L			01/23/13 20:11	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/23/13 20:11	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			01/23/13 20:11	1
4-Methyl-2-pentanone (MIBK)	**3.2**	**J**	10	0.32	ug/L			01/23/13 20:11	1
Styrene	0.11	U	1.0	0.11	ug/L			01/23/13 20:11	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/23/13 20:11	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			01/23/13 20:11	1
Toluene	**2.2**		1.0	0.13	ug/L			01/23/13 20:11	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 20:11	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/23/13 20:11	1
Xylenes, Total	**91**		2.0	0.28	ug/L			01/23/13 20:11	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 20:11	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/23/13 20:11	1
Cyclohexane	**9.5**		1.0	0.12	ug/L			01/23/13 20:11	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/23/13 20:11	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/23/13 20:11	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/23/13 20:11	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 20:11	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 20:11	1
Isopropylbenzene	**1.9**		1.0	0.13	ug/L			01/23/13 20:11	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/23/13 20:11	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/23/13 20:11	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/23/13 20:11	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 20:11	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 20:11	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/23/13 20:11	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 20:11	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/23/13 20:11	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/23/13 20:11	1
Methylcyclohexane	**29**		1.0	0.13	ug/L			01/23/13 20:11	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-6
Date Collected: 01/16/13 11:40
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-4
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		63 - 129		01/23/13 20:11	1
4-Bromofluorobenzene (Surr)	102		66 - 117		01/23/13 20:11	1
Toluene-d8 (Surr)	90		74 - 115		01/23/13 20:11	1
Dibromofluoromethane (Surr)	80		75 - 121		01/23/13 20:11	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-8
Date Collected: 01/15/13 15:18
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			01/23/13 20:33	1
Benzene	0.13	U	1.0	0.13	ug/L			01/23/13 20:33	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/23/13 20:33	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/23/13 20:33	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/23/13 20:33	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			01/23/13 20:33	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			01/23/13 20:33	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/23/13 20:33	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 20:33	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/23/13 20:33	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/23/13 20:33	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/23/13 20:33	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/23/13 20:33	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 20:33	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 20:33	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/23/13 20:33	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/23/13 20:33	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/23/13 20:33	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			01/23/13 20:33	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/23/13 20:33	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			01/23/13 20:33	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			01/23/13 20:33	1
Styrene	0.11	U	1.0	0.11	ug/L			01/23/13 20:33	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/23/13 20:33	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			01/23/13 20:33	1
Toluene	0.13	U	1.0	0.13	ug/L			01/23/13 20:33	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 20:33	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/23/13 20:33	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			01/23/13 20:33	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 20:33	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/23/13 20:33	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			01/23/13 20:33	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/23/13 20:33	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/23/13 20:33	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/23/13 20:33	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 20:33	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 20:33	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			01/23/13 20:33	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/23/13 20:33	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/23/13 20:33	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/23/13 20:33	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 20:33	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 20:33	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/23/13 20:33	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 20:33	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/23/13 20:33	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/23/13 20:33	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			01/23/13 20:33	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-8
Date Collected: 01/15/13 15:18
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-5
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		63 - 129		01/23/13 20:33	1
4-Bromofluorobenzene (Surr)	84		66 - 117		01/23/13 20:33	1
Toluene-d8 (Surr)	87		74 - 115		01/23/13 20:33	1
Dibromofluoromethane (Surr)	80		75 - 121		01/23/13 20:33	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	0.099	U	0.99	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Benzo[a]pyrene	0.099	U	0.99	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Benzo[b]fluoranthene	0.099	U	0.99	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Benzo[g,h,i]perylene	0.099	U	0.99	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Benzo[k]fluoranthene	0.099	U	0.99	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Anthracene	0.099	U	5.0	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Chrysene	0.099	U	0.99	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Dibenz(a,h)anthracene	0.099	U	2.0	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Fluoranthene	0.099	U	0.99	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Fluorene	0.099	U	5.0	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Indeno[1,2,3-cd]pyrene	0.099	U	2.0	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Phenanthrene	0.099	U	2.0	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Pyrene	0.099	U	5.0	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Acenaphthene	0.099	U	5.0	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Acenaphthylene	0.099	U	5.0	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
Naphthalene	0.099	U	5.0	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1
2-Methylnaphthalene	0.099	U	5.0	0.099	ug/L		01/21/13 11:18	01/23/13 15:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	61		20 - 110	01/21/13 11:18	01/23/13 15:34	1
2-Fluorophenol (Surr)	78		10 - 110	01/21/13 11:18	01/23/13 15:34	1
2,4,6-Tribromophenol (Surr)	80		21 - 110	01/21/13 11:18	01/23/13 15:34	1
Nitrobenzene-d5 (Surr)	66		21 - 110	01/21/13 11:18	01/23/13 15:34	1
Phenol-d5 (Surr)	80		21 - 110	01/21/13 11:18	01/23/13 15:34	1
Terphenyl-d14 (Surr)	70		24 - 110	01/21/13 11:18	01/23/13 15:34	1

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	0.16	U	0.48	0.16	ug/L		01/21/13 11:12	01/22/13 14:52	1
Aroclor-1221	0.13	U	0.48	0.13	ug/L		01/21/13 11:12	01/22/13 14:52	1
Aroclor-1232	0.15	U	0.48	0.15	ug/L		01/21/13 11:12	01/22/13 14:52	1
Aroclor-1242	0.21	U	0.48	0.21	ug/L		01/21/13 11:12	01/22/13 14:52	1
Aroclor-1248	0.096	U	0.48	0.096	ug/L		01/21/13 11:12	01/22/13 14:52	1
Aroclor-1254	0.15	U	0.48	0.15	ug/L		01/21/13 11:12	01/22/13 14:52	1
Aroclor-1260	0.16	U	0.48	0.16	ug/L		01/21/13 11:12	01/22/13 14:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	83		23 - 136	01/21/13 11:12	01/22/13 14:52	1
DCB Decachlorobiphenyl	61		10 - 130	01/21/13 11:12	01/22/13 14:52	1

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.036	U	1.0	0.036	ug/L		01/21/13 13:44	01/30/13 21:38	1
Arsenic	0.29	U	1.0	0.29	ug/L		01/21/13 13:44	01/30/13 21:38	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-8
Date Collected: 01/15/13 15:18
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-5
Matrix: Water

Method: 6020 - Metals (ICP/MS) - Dissolved (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**140**		10	0.098	ug/L		01/21/13 13:44	01/30/13 21:38	1
Cadmium	0.11	U	1.0	0.11	ug/L		01/21/13 13:44	01/30/13 21:38	1
Chromium	**0.94**	**J**	2.0	0.54	ug/L		01/21/13 13:44	01/30/13 21:38	1
Sodium	**270000**	**B**	100	3.8	ug/L		01/21/13 13:44	01/30/13 21:38	1
Nickel	0.17	U	1.0	0.17	ug/L		01/21/13 13:44	01/30/13 21:38	1
Lead	**0.17**	**J**	1.0	0.019	ug/L		01/21/13 13:44	01/30/13 21:38	1
Selenium	0.42	U	5.0	0.42	ug/L		01/21/13 13:44	01/30/13 21:38	1
Zinc	**1500**		5.0	0.96	ug/L		01/21/13 13:44	01/30/13 21:38	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.043**	**J**	0.20	0.038	ug/L		01/21/13 11:49	01/21/13 16:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**610**		10	1.0	mg/L			01/25/13 16:57	10

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-9
Date Collected: 01/16/13 10:58
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			01/23/13 20:56	1
Benzene	0.13	U	1.0	0.13	ug/L			01/23/13 20:56	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/23/13 20:56	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/23/13 20:56	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/23/13 20:56	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			01/23/13 20:56	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			01/23/13 20:56	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/23/13 20:56	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 20:56	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/23/13 20:56	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/23/13 20:56	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/23/13 20:56	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/23/13 20:56	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 20:56	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 20:56	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/23/13 20:56	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/23/13 20:56	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/23/13 20:56	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			01/23/13 20:56	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/23/13 20:56	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			01/23/13 20:56	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			01/23/13 20:56	1
Styrene	0.11	U	1.0	0.11	ug/L			01/23/13 20:56	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/23/13 20:56	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			01/23/13 20:56	1
Toluene	0.13	U	1.0	0.13	ug/L			01/23/13 20:56	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 20:56	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/23/13 20:56	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			01/23/13 20:56	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 20:56	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/23/13 20:56	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			01/23/13 20:56	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/23/13 20:56	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/23/13 20:56	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/23/13 20:56	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 20:56	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 20:56	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			01/23/13 20:56	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/23/13 20:56	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/23/13 20:56	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/23/13 20:56	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 20:56	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 20:56	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/23/13 20:56	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 20:56	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/23/13 20:56	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/23/13 20:56	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			01/23/13 20:56	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-9
Date Collected: 01/16/13 10:58
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-6
Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*63 - 129*		*01/23/13 20:56*	*1*
4-Bromofluorobenzene (Surr)	*86*		*66 - 117*		*01/23/13 20:56*	*1*
Toluene-d8 (Surr)	*85*		*74 - 115*		*01/23/13 20:56*	*1*
Dibromofluoromethane (Surr)	*82*		*75 - 121*		*01/23/13 20:56*	*1*

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	0.097	U	0.97	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Benzo[a]pyrene	0.097	U	0.97	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Benzo[b]fluoranthene	0.097	U	0.97	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Benzo[g,h,i]perylene	0.097	U	0.97	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Benzo[k]fluoranthene	0.097	U	0.97	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Anthracene	0.097	U	4.9	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Chrysene	0.097	U	0.97	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Dibenz(a,h)anthracene	0.097	U	1.9	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Fluoranthene	0.097	U	0.97	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Fluorene	0.097	U	4.9	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Indeno[1,2,3-cd]pyrene	0.097	U	1.9	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Phenanthrene	0.097	U	1.9	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Pyrene	0.097	U	4.9	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Acenaphthene	0.097	U	4.9	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Acenaphthylene	0.097	U	4.9	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
Naphthalene	0.097	U	4.9	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1
2-Methylnaphthalene	0.097	U	4.9	0.097	ug/L		01/21/13 11:18	01/23/13 15:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*67*		*20 - 110*	*01/21/13 11:18*	*01/23/13 15:57*	*1*
2-Fluorophenol (Surr)	*80*		*10 - 110*	*01/21/13 11:18*	*01/23/13 15:57*	*1*
2,4,6-Tribromophenol (Surr)	*91*		*21 - 110*	*01/21/13 11:18*	*01/23/13 15:57*	*1*
Nitrobenzene-d5 (Surr)	*69*		*21 - 110*	*01/21/13 11:18*	*01/23/13 15:57*	*1*
Phenol-d5 (Surr)	*83*		*21 - 110*	*01/21/13 11:18*	*01/23/13 15:57*	*1*
Terphenyl-d14 (Surr)	*77*		*24 - 110*	*01/21/13 11:18*	*01/23/13 15:57*	*1*

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.036	U	1.0	0.036	ug/L		01/21/13 13:44	01/30/13 21:43	1
Arsenic	0.29	U	1.0	0.29	ug/L		01/21/13 13:44	01/30/13 21:43	1
Barium	**180**		10	0.098	ug/L		01/21/13 13:44	01/30/13 21:43	1
Cadmium	0.11	U	1.0	0.11	ug/L		01/21/13 13:44	01/30/13 21:43	1
Chromium	**0.79**	**J**	2.0	0.54	ug/L		01/21/13 13:44	01/30/13 21:43	1
Sodium	**280000**	**B**	100	3.8	ug/L		01/21/13 13:44	01/30/13 21:43	1
Nickel	**0.22**	**J**	1.0	0.17	ug/L		01/21/13 13:44	01/30/13 21:43	1
Lead	0.019	U	1.0	0.019	ug/L		01/21/13 13:44	01/30/13 21:43	1
Selenium	0.42	U	5.0	0.42	ug/L		01/21/13 13:44	01/30/13 21:43	1
Zinc	**34**		5.0	0.96	ug/L		01/21/13 13:44	01/30/13 21:43	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038	U	0.20	0.038	ug/L		01/21/13 11:49	01/21/13 16:49	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-9
Date Collected: 01/16/13 10:58
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-6
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	610		10	1.0	mg/L			01/25/13 17:17	10

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-10
Date Collected: 01/16/13 12:00
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			01/23/13 21:18	1
Benzene	0.13	U	1.0	0.13	ug/L			01/23/13 21:18	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/23/13 21:18	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/23/13 21:18	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/23/13 21:18	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			01/23/13 21:18	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			01/23/13 21:18	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/23/13 21:18	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 21:18	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/23/13 21:18	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/23/13 21:18	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/23/13 21:18	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/23/13 21:18	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 21:18	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 21:18	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/23/13 21:18	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/23/13 21:18	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/23/13 21:18	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			01/23/13 21:18	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/23/13 21:18	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			01/23/13 21:18	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			01/23/13 21:18	1
Styrene	0.11	U	1.0	0.11	ug/L			01/23/13 21:18	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/23/13 21:18	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			01/23/13 21:18	1
Toluene	0.13	U	1.0	0.13	ug/L			01/23/13 21:18	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 21:18	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/23/13 21:18	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			01/23/13 21:18	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 21:18	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/23/13 21:18	1
Cyclohexane	**0.20**	**J**	1.0	0.12	ug/L			01/23/13 21:18	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/23/13 21:18	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/23/13 21:18	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/23/13 21:18	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 21:18	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 21:18	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			01/23/13 21:18	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/23/13 21:18	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/23/13 21:18	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/23/13 21:18	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 21:18	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 21:18	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/23/13 21:18	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 21:18	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/23/13 21:18	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/23/13 21:18	1
Methylcyclohexane	**0.19**	**J**	1.0	0.13	ug/L			01/23/13 21:18	1

Client Sample ID: MW-10
Date Collected: 01/16/13 12:00
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-7
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	89		63 - 129		01/23/13 21:18	1
4-Bromofluorobenzene (Surr)	89		66 - 117		01/23/13 21:18	1
Toluene-d8 (Surr)	89		74 - 115		01/23/13 21:18	1
Dibromofluoromethane (Surr)	82		75 - 121		01/23/13 21:18	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	**0.11**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Benzo[a]pyrene	**0.62**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Benzo[b]fluoranthene	**0.50**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Benzo[g,h,i]perylene	**0.14**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Benzo[k]fluoranthene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Anthracene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Chrysene	**0.19**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Dibenz(a,h)anthracene	0.10	U	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Fluoranthene	**0.46**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Fluorene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Indeno[1,2,3-cd]pyrene	**0.60**	**J**	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Phenanthrene	**0.13**	**J**	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Pyrene	**0.30**	**J**	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Acenaphthene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Acenaphthylene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
Naphthalene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1
2-Methylnaphthalene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	56		20 - 110	01/21/13 11:18	01/23/13 18:18	1
2-Fluorophenol (Surr)	74		10 - 110	01/21/13 11:18	01/23/13 18:18	1
2,4,6-Tribromophenol (Surr)	78		21 - 110	01/21/13 11:18	01/23/13 18:18	1
Nitrobenzene-d5 (Surr)	60		21 - 110	01/21/13 11:18	01/23/13 18:18	1
Phenol-d5 (Surr)	77		21 - 110	01/21/13 11:18	01/23/13 18:18	1
Terphenyl-d14 (Surr)	49		24 - 110	01/21/13 11:18	01/23/13 18:18	1

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.036	U	1.0	0.036	ug/L		01/21/13 13:44	01/30/13 21:48	1
Arsenic	**1.6**		1.0	0.29	ug/L		01/21/13 13:44	01/30/13 21:48	1
Barium	**69**		10	0.098	ug/L		01/21/13 13:44	01/30/13 21:48	1
Cadmium	0.11	U	1.0	0.11	ug/L		01/21/13 13:44	01/30/13 21:48	1
Chromium	**1.3**	**J**	2.0	0.54	ug/L		01/21/13 13:44	01/30/13 21:48	1
Sodium	**630000**	**B**	100	3.8	ug/L		01/21/13 13:44	01/30/13 21:48	1
Nickel	**0.97**	**J**	1.0	0.17	ug/L		01/21/13 13:44	01/30/13 21:48	1
Lead	**0.096**	**J**	1.0	0.019	ug/L		01/21/13 13:44	01/30/13 21:48	1
Selenium	0.42	U	5.0	0.42	ug/L		01/21/13 13:44	01/30/13 21:48	1
Zinc	**230**		5.0	0.96	ug/L		01/21/13 13:44	01/30/13 21:48	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038	U	0.20	0.038	ug/L		01/21/13 11:49	01/21/13 16:51	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-10
Date Collected: 01/16/13 12:00
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-7
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1200		20	2.0	mg/L			01/25/13 17:37	20

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-11
Date Collected: 01/16/13 10:00
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**1.5**	**J**	10	1.1	ug/L			01/22/13 12:10	1
Benzene	0.13	U	1.0	0.13	ug/L			01/22/13 12:10	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/22/13 12:10	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/22/13 12:10	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/22/13 12:10	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			01/22/13 12:10	1
Carbon disulfide	**0.22**	**J**	5.0	0.13	ug/L			01/22/13 12:10	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/22/13 12:10	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/22/13 12:10	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/22/13 12:10	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/22/13 12:10	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/22/13 12:10	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/22/13 12:10	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/22/13 12:10	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/22/13 12:10	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/22/13 12:10	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/22/13 12:10	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/22/13 12:10	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			01/22/13 12:10	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/22/13 12:10	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			01/22/13 12:10	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			01/22/13 12:10	1
Styrene	0.11	U	1.0	0.11	ug/L			01/22/13 12:10	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/22/13 12:10	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			01/22/13 12:10	1
Toluene	0.13	U	1.0	0.13	ug/L			01/22/13 12:10	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			01/22/13 12:10	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/22/13 12:10	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			01/22/13 12:10	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/22/13 12:10	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/22/13 12:10	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			01/22/13 12:10	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/22/13 12:10	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/22/13 12:10	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/22/13 12:10	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/22/13 12:10	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/22/13 12:10	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			01/22/13 12:10	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/22/13 12:10	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/22/13 12:10	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/22/13 12:10	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/22/13 12:10	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/22/13 12:10	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/22/13 12:10	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/22/13 12:10	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/22/13 12:10	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/22/13 12:10	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			01/22/13 12:10	1

Client Sample ID: MW-11
Date Collected: 01/16/13 10:00
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-8
Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*63 - 129*		*01/22/13 12:10*	*1*
4-Bromofluorobenzene (Surr)	*92*		*66 - 117*		*01/22/13 12:10*	*1*
Toluene-d8 (Surr)	*87*		*74 - 115*		*01/22/13 12:10*	*1*
Dibromofluoromethane (Surr)	*89*		*75 - 121*		*01/22/13 12:10*	*1*

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.036	U	1.0	0.036	ug/L		01/21/13 13:44	01/30/13 21:53	1
Arsenic	**1.8**		1.0	0.29	ug/L		01/21/13 13:44	01/30/13 21:53	1
Barium	**41**		10	0.098	ug/L		01/21/13 13:44	01/30/13 21:53	1
Cadmium	0.11	U	1.0	0.11	ug/L		01/21/13 13:44	01/30/13 21:53	1
Chromium	**1.1**	**J**	2.0	0.54	ug/L		01/21/13 13:44	01/30/13 21:53	1
Nickel	**3.8**		1.0	0.17	ug/L		01/21/13 13:44	01/30/13 21:53	1
Lead	**0.14**	**J**	1.0	0.019	ug/L		01/21/13 13:44	01/30/13 21:53	1
Selenium	0.42	U	5.0	0.42	ug/L		01/21/13 13:44	01/30/13 21:53	1
Zinc	**21**		5.0	0.96	ug/L		01/21/13 13:44	01/30/13 21:53	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038	U	0.20	0.038	ug/L		01/21/13 11:49	01/21/13 16:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**580**		20	2.0	mg/L			01/25/13 17:57	20

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: P-3-15'
Date Collected: 01/16/13 14:40
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-9
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			01/24/13 17:55	1
Benzene	0.13	U	1.0	0.13	ug/L			01/24/13 17:55	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/24/13 17:55	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/24/13 17:55	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/24/13 17:55	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			01/24/13 17:55	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			01/24/13 17:55	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/24/13 17:55	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/24/13 17:55	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/24/13 17:55	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/24/13 17:55	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/24/13 17:55	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/24/13 17:55	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/24/13 17:55	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/24/13 17:55	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/24/13 17:55	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/24/13 17:55	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/24/13 17:55	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			01/24/13 17:55	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/24/13 17:55	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			01/24/13 17:55	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			01/24/13 17:55	1
Styrene	0.11	U	1.0	0.11	ug/L			01/24/13 17:55	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/24/13 17:55	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			01/24/13 17:55	1
Toluene	0.13	U	1.0	0.13	ug/L			01/24/13 17:55	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			01/24/13 17:55	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/24/13 17:55	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			01/24/13 17:55	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/24/13 17:55	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/24/13 17:55	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			01/24/13 17:55	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/24/13 17:55	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/24/13 17:55	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/24/13 17:55	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/24/13 17:55	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/24/13 17:55	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			01/24/13 17:55	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/24/13 17:55	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/24/13 17:55	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/24/13 17:55	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/24/13 17:55	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/24/13 17:55	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/24/13 17:55	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/24/13 17:55	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/24/13 17:55	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/24/13 17:55	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			01/24/13 17:55	1

Client Sample ID: P-3-15'
Date Collected: 01/16/13 14:40
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-9
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*89*		*63 - 129*		*01/24/13 17:55*	*1*
4-Bromofluorobenzene (Surr)	*102*		*66 - 117*		*01/24/13 17:55*	*1*
Toluene-d8 (Surr)	*105*		*74 - 115*		*01/24/13 17:55*	*1*
Dibromofluoromethane (Surr)	*91*		*75 - 121*		*01/24/13 17:55*	*1*

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	**0.24**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Benzo[a]pyrene	**0.71**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Benzo[b]fluoranthene	**0.66**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Benzo[g,h,i]perylene	**0.20**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Benzo[k]fluoranthene	**0.13**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Anthracene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Chrysene	**0.22**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Dibenz(a,h)anthracene	0.10	U	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Fluoranthene	**0.36**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Fluorene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Indeno[1,2,3-cd]pyrene	**0.68**	**J**	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Phenanthrene	**0.11**	**J**	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Pyrene	**0.29**	**J**	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Acenaphthene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Acenaphthylene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
Naphthalene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1
2-Methylnaphthalene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 19:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	*58*		*20 - 110*	*01/21/13 11:18*	*01/23/13 19:28*	*1*
2-Fluorophenol (Surr)	*70*		*10 - 110*	*01/21/13 11:18*	*01/23/13 19:28*	*1*
2,4,6-Tribromophenol (Surr)	*79*		*21 - 110*	*01/21/13 11:18*	*01/23/13 19:28*	*1*
Nitrobenzene-d5 (Surr)	*57*		*21 - 110*	*01/21/13 11:18*	*01/23/13 19:28*	*1*
Phenol-d5 (Surr)	*74*		*21 - 110*	*01/21/13 11:18*	*01/23/13 19:28*	*1*
Terphenyl-d14 (Surr)	*69*		*24 - 110*	*01/21/13 11:18*	*01/23/13 19:28*	*1*

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.036	U	1.0	0.036	ug/L		01/21/13 13:44	01/30/13 22:07	1
Arsenic	0.29	U	1.0	0.29	ug/L		01/21/13 13:44	01/30/13 22:07	1
Barium	**95**		10	0.098	ug/L		01/21/13 13:44	01/30/13 22:07	1
Cadmium	0.11	U	1.0	0.11	ug/L		01/21/13 13:44	01/30/13 22:07	1
Chromium	**0.92**	**J**	2.0	0.54	ug/L		01/21/13 13:44	01/30/13 22:07	1
Sodium	**330000**	**B**	100	3.8	ug/L		01/21/13 13:44	01/30/13 22:07	1
Nickel	**0.44**	**J**	1.0	0.17	ug/L		01/21/13 13:44	01/30/13 22:07	1
Lead	**0.029**	**J**	1.0	0.019	ug/L		01/21/13 13:44	01/30/13 22:07	1
Selenium	0.42	U	5.0	0.42	ug/L		01/21/13 13:44	01/30/13 22:07	1
Zinc	**3.4**	**J**	5.0	0.96	ug/L		01/21/13 13:44	01/30/13 22:07	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038	U	0.20	0.038	ug/L		01/21/13 11:49	01/21/13 16:56	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: P-3-15'
Date Collected: 01/16/13 14:40
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-9
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	630		10	1.0	mg/L			01/25/13 18:18	10

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: STORMWATER-1
Date Collected: 01/16/13 15:20
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-10
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			01/24/13 18:18	1
Benzene	0.13	U	1.0	0.13	ug/L			01/24/13 18:18	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/24/13 18:18	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/24/13 18:18	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/24/13 18:18	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			01/24/13 18:18	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			01/24/13 18:18	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/24/13 18:18	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/24/13 18:18	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/24/13 18:18	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/24/13 18:18	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/24/13 18:18	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/24/13 18:18	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/24/13 18:18	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/24/13 18:18	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/24/13 18:18	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/24/13 18:18	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/24/13 18:18	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			01/24/13 18:18	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/24/13 18:18	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			01/24/13 18:18	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			01/24/13 18:18	1
Styrene	0.11	U	1.0	0.11	ug/L			01/24/13 18:18	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/24/13 18:18	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			01/24/13 18:18	1
Toluene	0.13	U	1.0	0.13	ug/L			01/24/13 18:18	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			01/24/13 18:18	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/24/13 18:18	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			01/24/13 18:18	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/24/13 18:18	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/24/13 18:18	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			01/24/13 18:18	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/24/13 18:18	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/24/13 18:18	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/24/13 18:18	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/24/13 18:18	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/24/13 18:18	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			01/24/13 18:18	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/24/13 18:18	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/24/13 18:18	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/24/13 18:18	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/24/13 18:18	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/24/13 18:18	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/24/13 18:18	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/24/13 18:18	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/24/13 18:18	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/24/13 18:18	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			01/24/13 18:18	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: STORMWATER-1
Date Collected: 01/16/13 15:20
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-10
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*95*		*63 - 129*		*01/24/13 18:18*	*1*
4-Bromofluorobenzene (Surr)	*102*		*66 - 117*		*01/24/13 18:18*	*1*
Toluene-d8 (Surr)	*108*		*74 - 115*		*01/24/13 18:18*	*1*
Dibromofluoromethane (Surr)	*96*		*75 - 121*		*01/24/13 18:18*	*1*

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	**0.17**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Benzo[a]pyrene	**0.67**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Benzo[b]fluoranthene	**0.57**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Benzo[g,h,i]perylene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Benzo[k]fluoranthene	**0.12**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Anthracene	0.10	U	5.1	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Chrysene	**0.20**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Dibenz(a,h)anthracene	0.10	U	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Fluoranthene	**0.27**	**J**	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Fluorene	0.10	U	5.1	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Indeno[1,2,3-cd]pyrene	0.10	U	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Phenanthrene	0.10	U	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Pyrene	**0.24**	**J**	5.1	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Acenaphthene	0.10	U	5.1	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Acenaphthylene	0.10	U	5.1	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
Naphthalene	0.10	U	5.1	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1
2-Methylnaphthalene	0.10	U	5.1	0.10	ug/L		01/21/13 11:18	01/23/13 18:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	*56*		*20 - 110*	*01/21/13 11:18*	*01/23/13 18:41*	*1*
2-Fluorophenol (Surr)	*71*		*10 - 110*	*01/21/13 11:18*	*01/23/13 18:41*	*1*
2,4,6-Tribromophenol (Surr)	*81*		*21 - 110*	*01/21/13 11:18*	*01/23/13 18:41*	*1*
Nitrobenzene-d5 (Surr)	*60*		*21 - 110*	*01/21/13 11:18*	*01/23/13 18:41*	*1*
Phenol-d5 (Surr)	*74*		*21 - 110*	*01/21/13 11:18*	*01/23/13 18:41*	*1*
Terphenyl-d14 (Surr)	*56*		*24 - 110*	*01/21/13 11:18*	*01/23/13 18:41*	*1*

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	0.17	U	0.50	0.17	ug/L		01/21/13 11:12	01/22/13 15:07	1
Aroclor-1221	0.13	U	0.50	0.13	ug/L		01/21/13 11:12	01/22/13 15:07	1
Aroclor-1232	0.16	U	0.50	0.16	ug/L		01/21/13 11:12	01/22/13 15:07	1
Aroclor-1242	0.22	U	0.50	0.22	ug/L		01/21/13 11:12	01/22/13 15:07	1
Aroclor-1248	0.099	U	0.50	0.099	ug/L		01/21/13 11:12	01/22/13 15:07	1
Aroclor-1254	0.16	U	0.50	0.16	ug/L		01/21/13 11:12	01/22/13 15:07	1
Aroclor-1260	0.17	U	0.50	0.17	ug/L		01/21/13 11:12	01/22/13 15:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	*82*		*23 - 136*	*01/21/13 11:12*	*01/22/13 15:07*	*1*
DCB Decachlorobiphenyl	*50*		*10 - 130*	*01/21/13 11:12*	*01/22/13 15:07*	*1*

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.036	U	1.0	0.036	ug/L		01/21/13 13:44	01/30/13 22:12	1
Arsenic	0.29	U	1.0	0.29	ug/L		01/21/13 13:44	01/30/13 22:12	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: STORMWATER-1
Date Collected: 01/16/13 15:20
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-10
Matrix: Water

Method: 6020 - Metals (ICP/MS) - Dissolved (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**39**		10	0.098	ug/L		01/21/13 13:44	01/30/13 22:12	1
Cadmium	0.11	U	1.0	0.11	ug/L		01/21/13 13:44	01/30/13 22:12	1
Chromium	**0.61**	**J**	2.0	0.54	ug/L		01/21/13 13:44	01/30/13 22:12	1
Sodium	**62000**	**B**	100	3.8	ug/L		01/21/13 13:44	01/30/13 22:12	1
Nickel	**0.29**	**J**	1.0	0.17	ug/L		01/21/13 13:44	01/30/13 22:12	1
Lead	**0.13**	**J**	1.0	0.019	ug/L		01/21/13 13:44	01/30/13 22:12	1
Selenium	**0.67**	**J**	5.0	0.42	ug/L		01/21/13 13:44	01/30/13 22:12	1
Zinc	**15**		5.0	0.96	ug/L		01/21/13 13:44	01/30/13 22:12	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038	U	0.20	0.038	ug/L		01/21/13 11:49	01/21/13 16:58	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**110**		1.0	0.10	mg/L			01/25/13 18:38	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: TRIP BLANK
Date Collected: 01/15/13 00:00
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**6.2**	**J**	10	1.1	ug/L			01/24/13 18:40	1
Benzene	0.13	U	1.0	0.13	ug/L			01/24/13 18:40	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/24/13 18:40	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/24/13 18:40	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/24/13 18:40	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			01/24/13 18:40	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			01/24/13 18:40	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/24/13 18:40	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/24/13 18:40	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/24/13 18:40	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/24/13 18:40	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/24/13 18:40	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/24/13 18:40	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/24/13 18:40	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/24/13 18:40	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/24/13 18:40	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/24/13 18:40	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/24/13 18:40	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			01/24/13 18:40	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/24/13 18:40	1
Methylene Chloride	**0.75**	**J B**	5.0	0.33	ug/L			01/24/13 18:40	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			01/24/13 18:40	1
Styrene	0.11	U	1.0	0.11	ug/L			01/24/13 18:40	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/24/13 18:40	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			01/24/13 18:40	1
Toluene	0.13	U	1.0	0.13	ug/L			01/24/13 18:40	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			01/24/13 18:40	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/24/13 18:40	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			01/24/13 18:40	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/24/13 18:40	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/24/13 18:40	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			01/24/13 18:40	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/24/13 18:40	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/24/13 18:40	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/24/13 18:40	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/24/13 18:40	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/24/13 18:40	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			01/24/13 18:40	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/24/13 18:40	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/24/13 18:40	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/24/13 18:40	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/24/13 18:40	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/24/13 18:40	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/24/13 18:40	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/24/13 18:40	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/24/13 18:40	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/24/13 18:40	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			01/24/13 18:40	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: TRIP BLANK
Date Collected: 01/15/13 00:00
Date Received: 01/18/13 09:15

Lab Sample ID: 240-20086-11
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		63 - 129		01/24/13 18:40	1
4-Bromofluorobenzene (Surr)	102		66 - 117		01/24/13 18:40	1
Toluene-d8 (Surr)	110		74 - 115		01/24/13 18:40	1
Dibromofluoromethane (Surr)	97		75 - 121		01/24/13 18:40	1

Surrogate Summary

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(63-129)	(66-117)	(74-115)	(75-121)
240-20086-1	MW-2	96	82	85	84
240-20086-2	MW-4	95	89	85	86
240-20086-3	MW-5	104	89	85	91
240-20086-4	MW-6	88	102	90	80
240-20086-5	MW-8	87	84	87	80
240-20086-6	MW-9	89	86	85	82
240-20086-7	MW-10	89	89	89	82
240-20086-8	MW-11	95	92	87	89
240-20086-9	P-3-15'	89	102	105	91
240-20086-10	STORMWATER-1	95	102	108	96
240-20086-11	TRIP BLANK	93	102	110	97
LCS 240-72813/4	Lab Control Sample	86	102	95	87
LCS 240-72939/4	Lab Control Sample	87	114	99	90
LCS 240-73083/4	Lab Control Sample	89	116	109	95
MB 240-72813/5	Method Blank	95	90	88	85
MB 240-72939/5	Method Blank	92	85	86	84
MB 240-73083/5	Method Blank	91	112	111	92

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		FBP	2FP	TBP	NBZ	PHL	TPH
Lab Sample ID	Client Sample ID	(20-110)	(10-110)	(21-110)	(21-110)	(21-110)	(24-110)
240-20086-1	MW-2	60	73	76	63	76	70
240-20086-2	MW-4	57	71	83	60	73	73
240-20086-3	MW-5	61	75	80	63	78	70
240-20086-5	MW-8	61	78	80	66	80	70
240-20086-6	MW-9	67	80	91	69	83	77
240-20086-7	MW-10	56	74	78	60	77	49
240-20086-9	P-3-15'	58	70	79	57	74	69
240-20086-10	STORMWATER-1	56	71	81	60	74	56
LCS 240-72694/12-A	Lab Control Sample	70	88	86	76	88	75
MB 240-72694/11-A	Method Blank	71	91	85	74	92	80

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

Surrogate Summary

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		TCX2	DCB2								
Lab Sample ID	Client Sample ID	(23-136)	(10-130)								
240-20086-5	MW-8	83	61								
240-20086-10	STORMWATER-1	82	50								
LCS 240-72692/5-A	Lab Control Sample	76	66								
MB 240-72692/4-A	Method Blank	77	70								

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCB = DCB Decachlorobiphenyl

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-72813/5
Matrix: Water
Analysis Batch: 72813

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			01/22/13 11:47	1
Benzene	0.13	U	1.0	0.13	ug/L			01/22/13 11:47	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/22/13 11:47	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/22/13 11:47	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/22/13 11:47	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			01/22/13 11:47	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			01/22/13 11:47	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/22/13 11:47	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/22/13 11:47	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/22/13 11:47	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/22/13 11:47	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/22/13 11:47	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/22/13 11:47	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/22/13 11:47	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/22/13 11:47	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/22/13 11:47	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/22/13 11:47	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/22/13 11:47	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			01/22/13 11:47	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/22/13 11:47	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			01/22/13 11:47	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			01/22/13 11:47	1
Styrene	0.11	U	1.0	0.11	ug/L			01/22/13 11:47	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/22/13 11:47	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			01/22/13 11:47	1
Toluene	0.13	U	1.0	0.13	ug/L			01/22/13 11:47	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			01/22/13 11:47	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/22/13 11:47	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			01/22/13 11:47	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/22/13 11:47	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/22/13 11:47	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			01/22/13 11:47	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/22/13 11:47	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/22/13 11:47	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/22/13 11:47	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/22/13 11:47	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/22/13 11:47	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			01/22/13 11:47	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/22/13 11:47	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/22/13 11:47	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/22/13 11:47	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/22/13 11:47	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/22/13 11:47	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/22/13 11:47	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/22/13 11:47	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/22/13 11:47	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/22/13 11:47	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			01/22/13 11:47	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-72813/5
Matrix: Water
Analysis Batch: 72813

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	95		63 - 129		01/22/13 11:47	1
4-Bromofluorobenzene (Surr)	90		66 - 117		01/22/13 11:47	1
Toluene-d8 (Surr)	88		74 - 115		01/22/13 11:47	1
Dibromofluoromethane (Surr)	85		75 - 121		01/22/13 11:47	1

Lab Sample ID: LCS 240-72813/4
Matrix: Water
Analysis Batch: 72813

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	22.3		ug/L		112	43 - 136
Benzene	10.0	9.54		ug/L		95	83 - 112
Bromodichloromethane	10.0	9.75		ug/L		97	72 - 121
Bromoform	10.0	8.17		ug/L		82	40 - 131
Bromomethane	10.0	7.44		ug/L		74	11 - 185
2-Butanone (MEK)	20.0	19.7		ug/L		98	60 - 126
Carbon disulfide	10.0	8.24		ug/L		82	62 - 142
Carbon tetrachloride	10.0	10.1		ug/L		101	66 - 128
Chlorobenzene	10.0	9.95		ug/L		100	85 - 110
Chloroethane	10.0	7.61		ug/L		76	25 - 153
Chloroform	10.0	8.70		ug/L		87	79 - 117
Chloromethane	10.0	7.67		ug/L		77	44 - 126
1,1-Dichloroethane	10.0	9.36		ug/L		94	82 - 115
1,2-Dichloroethane	10.0	9.77		ug/L		98	71 - 127
1,1-Dichloroethene	10.0	8.27		ug/L		83	78 - 131
1,2-Dichloropropane	10.0	10.5		ug/L		105	81 - 115
cis-1,3-Dichloropropene	10.0	9.25		ug/L		92	61 - 115
trans-1,3-Dichloropropene	10.0	9.53		ug/L		95	58 - 117
Ethylbenzene	10.0	9.75		ug/L		97	83 - 112
2-Hexanone	20.0	21.7		ug/L		108	55 - 133
Methylene Chloride	10.0	9.64		ug/L		96	66 - 131
4-Methyl-2-pentanone (MIBK)	20.0	20.2		ug/L		101	63 - 128
Styrene	10.0	10.2		ug/L		102	79 - 114
1,1,2,2-Tetrachloroethane	10.0	9.96		ug/L		100	68 - 118
Tetrachloroethene	10.0	8.96		ug/L		90	79 - 114
Toluene	10.0	9.68		ug/L		97	84 - 111
Trichloroethene	10.0	9.06		ug/L		91	76 - 117
Vinyl chloride	10.0	7.51		ug/L		75	53 - 127
Xylenes, Total	30.0	29.8		ug/L		99	83 - 112
1,1,1-Trichloroethane	10.0	9.74		ug/L		97	74 - 118
1,1,2-Trichloroethane	10.0	10.2		ug/L		102	80 - 112
Cyclohexane	10.0	8.69		ug/L		87	54 - 121
1,2-Dibromo-3-Chloropropane	10.0	8.47		ug/L		85	42 - 136
1,2-Dibromoethane	10.0	10.2		ug/L		102	79 - 113
Dichlorodifluoromethane	10.0	7.31		ug/L		73	19 - 129
cis-1,2-Dichloroethene	10.0	9.18		ug/L		92	80 - 113
trans-1,2-Dichloroethene	10.0	9.36		ug/L		94	83 - 117
Isopropylbenzene	10.0	9.55		ug/L		95	75 - 114

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-72813/4
Matrix: Water
Analysis Batch: 72813

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methyl acetate	10.0	9.61	J	ug/L		96	58 - 131
Methyl tert-butyl ether	10.0	9.07		ug/L		91	52 - 144
1,1,2-Trichloro-1,2,2-trifluoroethane	10.0	8.55		ug/L		85	74 - 151
1,2,4-Trichlorobenzene	10.0	8.31		ug/L		83	48 - 135
1,2-Dichlorobenzene	10.0	9.60		ug/L		96	81 - 110
1,3-Dichlorobenzene	10.0	9.81		ug/L		98	80 - 110
1,4-Dichlorobenzene	10.0	9.41		ug/L		94	82 - 110
Trichlorofluoromethane	10.0	7.97		ug/L		80	49 - 157
Dibromochloromethane	10.0	9.83		ug/L		98	64 - 119
Methylcyclohexane	10.0	8.48		ug/L		85	56 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*63 - 129*
4-Bromofluorobenzene (Surr)	*102*		*66 - 117*
Toluene-d8 (Surr)	*95*		*74 - 115*
Dibromofluoromethane (Surr)	*87*		*75 - 121*

Lab Sample ID: MB 240-72939/5
Matrix: Water
Analysis Batch: 72939

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			01/23/13 11:54	1
Benzene	0.13	U	1.0	0.13	ug/L			01/23/13 11:54	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/23/13 11:54	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/23/13 11:54	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/23/13 11:54	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			01/23/13 11:54	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			01/23/13 11:54	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/23/13 11:54	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 11:54	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/23/13 11:54	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/23/13 11:54	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/23/13 11:54	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/23/13 11:54	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 11:54	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 11:54	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/23/13 11:54	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/23/13 11:54	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/23/13 11:54	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			01/23/13 11:54	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/23/13 11:54	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			01/23/13 11:54	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			01/23/13 11:54	1
Styrene	0.11	U	1.0	0.11	ug/L			01/23/13 11:54	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/23/13 11:54	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			01/23/13 11:54	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-72939/5
Matrix: Water
Analysis Batch: 72939

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	0.13	U	1.0	0.13	ug/L			01/23/13 11:54	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 11:54	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/23/13 11:54	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			01/23/13 11:54	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/23/13 11:54	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/23/13 11:54	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			01/23/13 11:54	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/23/13 11:54	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/23/13 11:54	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/23/13 11:54	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/23/13 11:54	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/23/13 11:54	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			01/23/13 11:54	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/23/13 11:54	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/23/13 11:54	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/23/13 11:54	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/23/13 11:54	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 11:54	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/23/13 11:54	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/23/13 11:54	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/23/13 11:54	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/23/13 11:54	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			01/23/13 11:54	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*63 - 129*		*01/23/13 11:54*	*1*
4-Bromofluorobenzene (Surr)	*85*		*66 - 117*		*01/23/13 11:54*	*1*
Toluene-d8 (Surr)	*86*		*74 - 115*		*01/23/13 11:54*	*1*
Dibromofluoromethane (Surr)	*84*		*75 - 121*		*01/23/13 11:54*	*1*

Lab Sample ID: LCS 240-72939/4
Matrix: Water
Analysis Batch: 72939

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	26.1		ug/L		130	43 - 136
Benzene	10.0	9.75		ug/L		97	83 - 112
Bromodichloromethane	10.0	9.30		ug/L		93	72 - 121
Bromoform	10.0	8.37		ug/L		84	40 - 131
Bromomethane	10.0	7.67		ug/L		77	11 - 185
2-Butanone (MEK)	20.0	20.8		ug/L		104	60 - 126
Carbon disulfide	10.0	8.57		ug/L		86	62 - 142
Carbon tetrachloride	10.0	10.3		ug/L		103	66 - 128
Chlorobenzene	10.0	9.95		ug/L		100	85 - 110
Chloroethane	10.0	7.61		ug/L		76	25 - 153
Chloroform	10.0	9.11		ug/L		91	79 - 117
Chloromethane	10.0	8.57		ug/L		86	44 - 126
1,1-Dichloroethane	10.0	9.90		ug/L		99	82 - 115

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-72939/4
Matrix: Water
Analysis Batch: 72939

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dichloroethane	10.0	9.62		ug/L		96	71 - 127
1,1-Dichloroethene	10.0	8.65		ug/L		87	78 - 131
1,2-Dichloropropane	10.0	10.1		ug/L		101	81 - 115
cis-1,3-Dichloropropene	10.0	8.18		ug/L		82	61 - 115
trans-1,3-Dichloropropene	10.0	9.13		ug/L		91	58 - 117
Ethylbenzene	10.0	10.3		ug/L		103	83 - 112
2-Hexanone	20.0	24.7		ug/L		123	55 - 133
Methylene Chloride	10.0	9.93		ug/L		99	66 - 131
4-Methyl-2-pentanone (MIBK)	20.0	19.8		ug/L		99	63 - 128
Styrene	10.0	10.7		ug/L		107	79 - 114
1,1,2,2-Tetrachloroethane	10.0	9.76		ug/L		98	68 - 118
Tetrachloroethene	10.0	9.82		ug/L		98	79 - 114
Toluene	10.0	10.1		ug/L		101	84 - 111
Trichloroethene	10.0	9.15		ug/L		92	76 - 117
Vinyl chloride	10.0	8.54		ug/L		85	53 - 127
Xylenes, Total	30.0	31.6		ug/L		105	83 - 112
1,1,1-Trichloroethane	10.0	9.85		ug/L		98	74 - 118
1,1,2-Trichloroethane	10.0	10.2		ug/L		102	80 - 112
Cyclohexane	10.0	9.66		ug/L		97	54 - 121
1,2-Dibromo-3-Chloropropane	10.0	7.90		ug/L		79	42 - 136
1,2-Dibromoethane	10.0	9.93		ug/L		99	79 - 113
Dichlorodifluoromethane	10.0	8.31		ug/L		83	19 - 129
cis-1,2-Dichloroethene	10.0	9.49		ug/L		95	80 - 113
trans-1,2-Dichloroethene	10.0	9.70		ug/L		97	83 - 117
Isopropylbenzene	10.0	10.4		ug/L		104	75 - 114
Methyl acetate	10.0	10.2		ug/L		102	58 - 131
Methyl tert-butyl ether	10.0	9.49		ug/L		95	52 - 144
1,1,2-Trichloro-1,2,2-trifluoroethane	10.0	8.59		ug/L		86	74 - 151
1,2,4-Trichlorobenzene	10.0	8.60		ug/L		86	48 - 135
1,2-Dichlorobenzene	10.0	9.87		ug/L		99	81 - 110
1,3-Dichlorobenzene	10.0	9.95		ug/L		100	80 - 110
1,4-Dichlorobenzene	10.0	9.78		ug/L		98	82 - 110
Trichlorofluoromethane	10.0	7.73		ug/L		77	49 - 157
Dibromochloromethane	10.0	9.32		ug/L		93	64 - 119
Methylcyclohexane	10.0	9.20		ug/L		92	56 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*63 - 129*
4-Bromofluorobenzene (Surr)	*114*		*66 - 117*
Toluene-d8 (Surr)	*99*		*74 - 115*
Dibromofluoromethane (Surr)	*90*		*75 - 121*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-73083/5
Matrix: Water
Analysis Batch: 73083

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			01/24/13 11:51	1
Benzene	0.13	U	1.0	0.13	ug/L			01/24/13 11:51	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			01/24/13 11:51	1
Bromoform	0.64	U	1.0	0.64	ug/L			01/24/13 11:51	1
Bromomethane	0.41	U	1.0	0.41	ug/L			01/24/13 11:51	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			01/24/13 11:51	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			01/24/13 11:51	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			01/24/13 11:51	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			01/24/13 11:51	1
Chloroethane	0.29	U	1.0	0.29	ug/L			01/24/13 11:51	1
Chloroform	0.16	U	1.0	0.16	ug/L			01/24/13 11:51	1
Chloromethane	0.30	U	1.0	0.30	ug/L			01/24/13 11:51	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			01/24/13 11:51	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/24/13 11:51	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/24/13 11:51	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/24/13 11:51	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			01/24/13 11:51	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			01/24/13 11:51	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			01/24/13 11:51	1
2-Hexanone	0.41	U	10	0.41	ug/L			01/24/13 11:51	1
Methylene Chloride	0.685	J	5.0	0.33	ug/L			01/24/13 11:51	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			01/24/13 11:51	1
Styrene	0.11	U	1.0	0.11	ug/L			01/24/13 11:51	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			01/24/13 11:51	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			01/24/13 11:51	1
Toluene	0.13	U	1.0	0.13	ug/L			01/24/13 11:51	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			01/24/13 11:51	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/24/13 11:51	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			01/24/13 11:51	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			01/24/13 11:51	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			01/24/13 11:51	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			01/24/13 11:51	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			01/24/13 11:51	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			01/24/13 11:51	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			01/24/13 11:51	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			01/24/13 11:51	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			01/24/13 11:51	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			01/24/13 11:51	1
Methyl acetate	0.38	U	10	0.38	ug/L			01/24/13 11:51	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			01/24/13 11:51	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			01/24/13 11:51	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			01/24/13 11:51	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/24/13 11:51	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			01/24/13 11:51	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			01/24/13 11:51	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			01/24/13 11:51	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			01/24/13 11:51	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			01/24/13 11:51	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-73083/5
Matrix: Water
Analysis Batch: 73083

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*91*		*63 - 129*		*01/24/13 11:51*	*1*
4-Bromofluorobenzene (Surr)	*112*		*66 - 117*		*01/24/13 11:51*	*1*
Toluene-d8 (Surr)	*111*		*74 - 115*		*01/24/13 11:51*	*1*
Dibromofluoromethane (Surr)	*92*		*75 - 121*		*01/24/13 11:51*	*1*

Lab Sample ID: LCS 240-73083/4
Matrix: Water
Analysis Batch: 73083

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	18.7		ug/L		94	43 - 136
Benzene	10.0	9.14		ug/L		91	83 - 112
Bromodichloromethane	10.0	9.00		ug/L		90	72 - 121
Bromoform	10.0	9.94		ug/L		99	40 - 131
Bromomethane	10.0	7.15		ug/L		71	11 - 185
2-Butanone (MEK)	20.0	18.6		ug/L		93	60 - 126
Carbon disulfide	10.0	7.63		ug/L		76	62 - 142
Carbon tetrachloride	10.0	11.1		ug/L		111	66 - 128
Chlorobenzene	10.0	9.60		ug/L		96	85 - 110
Chloroethane	10.0	7.90		ug/L		79	25 - 153
Chloroform	10.0	9.33		ug/L		93	79 - 117
Chloromethane	10.0	8.00		ug/L		80	44 - 126
1,1-Dichloroethane	10.0	9.89		ug/L		99	82 - 115
1,2-Dichloroethane	10.0	9.42		ug/L		94	71 - 127
1,1-Dichloroethene	10.0	8.42		ug/L		84	78 - 131
1,2-Dichloropropane	10.0	9.09		ug/L		91	81 - 115
cis-1,3-Dichloropropene	10.0	8.25		ug/L		82	61 - 115
trans-1,3-Dichloropropene	10.0	9.84		ug/L		98	58 - 117
Ethylbenzene	10.0	9.40		ug/L		94	83 - 112
2-Hexanone	20.0	19.2		ug/L		96	55 - 133
Methylene Chloride	10.0	8.53		ug/L		85	66 - 131
4-Methyl-2-pentanone (MIBK)	20.0	17.1		ug/L		85	63 - 128
Styrene	10.0	9.35		ug/L		94	79 - 114
1,1,2,2-Tetrachloroethane	10.0	9.24		ug/L		92	68 - 118
Tetrachloroethene	10.0	10.7		ug/L		107	79 - 114
Toluene	10.0	10.5		ug/L		105	84 - 111
Trichloroethene	10.0	9.46		ug/L		95	76 - 117
Vinyl chloride	10.0	7.70		ug/L		77	53 - 127
Xylenes, Total	30.0	28.6		ug/L		95	83 - 112
1,1,1-Trichloroethane	10.0	11.0		ug/L		110	74 - 118
1,1,2-Trichloroethane	10.0	10.3		ug/L		103	80 - 112
Cyclohexane	10.0	9.95		ug/L		99	54 - 121
1,2-Dibromo-3-Chloropropane	10.0	8.14		ug/L		81	42 - 136
1,2-Dibromoethane	10.0	9.37		ug/L		94	79 - 113
Dichlorodifluoromethane	10.0	8.65		ug/L		87	19 - 129
cis-1,2-Dichloroethene	10.0	8.99		ug/L		90	80 - 113
trans-1,2-Dichloroethene	10.0	9.38		ug/L		94	83 - 117
Isopropylbenzene	10.0	9.74		ug/L		97	75 - 114

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-73083/4
Matrix: Water
Analysis Batch: 73083

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methyl acetate	10.0	9.74	J	ug/L		97	58 - 131
Methyl tert-butyl ether	10.0	9.16		ug/L		92	52 - 144
1,1,2-Trichloro-1,2,2-trifluoroethane	10.0	10.8		ug/L		108	74 - 151
1,2,4-Trichlorobenzene	10.0	6.82		ug/L		68	48 - 135
1,2-Dichlorobenzene	10.0	8.93		ug/L		89	81 - 110
1,3-Dichlorobenzene	10.0	9.54		ug/L		95	80 - 110
1,4-Dichlorobenzene	10.0	9.28		ug/L		93	82 - 110
Trichlorofluoromethane	10.0	13.9		ug/L		139	49 - 157
Dibromochloromethane	10.0	9.54		ug/L		95	64 - 119
Methylcyclohexane	10.0	10.0		ug/L		100	56 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*63 - 129*
4-Bromofluorobenzene (Surr)	*116*		*66 - 117*
Toluene-d8 (Surr)	*109*		*74 - 115*
Dibromofluoromethane (Surr)	*95*		*75 - 121*

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-72694/11-A
Matrix: Water
Analysis Batch: 72929

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 72694

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Benzo[a]pyrene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Benzo[b]fluoranthene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Benzo[g,h,i]perylene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Benzo[k]fluoranthene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Anthracene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Chrysene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Dibenz(a,h)anthracene	0.10	U	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Fluoranthene	0.10	U	1.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Fluorene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Indeno[1,2,3-cd]pyrene	0.10	U	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Phenanthrene	0.10	U	2.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Pyrene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Acenaphthene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Acenaphthylene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
Naphthalene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1
2-Methylnaphthalene	0.10	U	5.0	0.10	ug/L		01/21/13 11:18	01/23/13 09:42	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*71*		*20 - 110*	*01/21/13 11:18*	*01/23/13 09:42*	*1*
2-Fluorophenol (Surr)	*91*		*10 - 110*	*01/21/13 11:18*	*01/23/13 09:42*	*1*
2,4,6-Tribromophenol (Surr)	*85*		*21 - 110*	*01/21/13 11:18*	*01/23/13 09:42*	*1*

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-72694/11-A
Matrix: Water
Analysis Batch: 72929

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 72694

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5 (Surr)	74		21 - 110	01/21/13 11:18	01/23/13 09:42	1
Phenol-d5 (Surr)	92		21 - 110	01/21/13 11:18	01/23/13 09:42	1
Terphenyl-d14 (Surr)	80		24 - 110	01/21/13 11:18	01/23/13 09:42	1

Lab Sample ID: LCS 240-72694/12-A
Matrix: Water
Analysis Batch: 72929

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 72694

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzo[a]anthracene	20.0	17.0		ug/L		85	52 - 110
Benzo[a]pyrene	20.0	13.2		ug/L		66	44 - 110
Benzo[b]fluoranthene	20.0	15.9		ug/L		80	48 - 110
Benzo[g,h,i]perylene	20.0	15.4		ug/L		77	50 - 110
Benzo[k]fluoranthene	20.0	15.2		ug/L		76	49 - 110
Anthracene	20.0	17.4		ug/L		87	52 - 110
Chrysene	20.0	17.0		ug/L		85	55 - 110
Dibenz(a,h)anthracene	20.0	14.7		ug/L		74	49 - 110
Fluoranthene	20.0	18.0		ug/L		90	54 - 110
Fluorene	20.0	17.2		ug/L		86	52 - 110
Indeno[1,2,3-cd]pyrene	20.0	14.3		ug/L		71	50 - 110
Phenanthrene	20.0	16.9		ug/L		84	53 - 110
Pyrene	20.0	16.9		ug/L		84	52 - 110
Acenaphthene	20.0	16.7		ug/L		83	47 - 110
Acenaphthylene	20.0	18.3		ug/L		91	49 - 110
Naphthalene	20.0	17.1		ug/L		85	44 - 110
2-Methylnaphthalene	20.0	17.8		ug/L		89	45 - 110

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	70		20 - 110
2-Fluorophenol (Surr)	88		10 - 110
2,4,6-Tribromophenol (Surr)	86		21 - 110
Nitrobenzene-d5 (Surr)	76		21 - 110
Phenol-d5 (Surr)	88		21 - 110
Terphenyl-d14 (Surr)	75		24 - 110

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 240-72692/4-A
Matrix: Water
Analysis Batch: 72877

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 72692

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	0.17	U	0.50	0.17	ug/L		01/21/13 11:12	01/22/13 15:34	1
Aroclor-1221	0.13	U	0.50	0.13	ug/L		01/21/13 11:12	01/22/13 15:34	1
Aroclor-1232	0.16	U	0.50	0.16	ug/L		01/21/13 11:12	01/22/13 15:34	1
Aroclor-1242	0.22	U	0.50	0.22	ug/L		01/21/13 11:12	01/22/13 15:34	1
Aroclor-1248	0.10	U	0.50	0.10	ug/L		01/21/13 11:12	01/22/13 15:34	1

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: MB 240-72692/4-A
Matrix: Water
Analysis Batch: 72877

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 72692

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1254	0.16	U	0.50	0.16	ug/L		01/21/13 11:12	01/22/13 15:34	1
Aroclor-1260	0.17	U	0.50	0.17	ug/L		01/21/13 11:12	01/22/13 15:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*77*		*23 - 136*	*01/21/13 11:12*	*01/22/13 15:34*	*1*
DCB Decachlorobiphenyl	*70*		*10 - 130*	*01/21/13 11:12*	*01/22/13 15:34*	*1*

Lab Sample ID: LCS 240-72692/5-A
Matrix: Water
Analysis Batch: 72877

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 72692

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aroclor-1016	5.00	4.28		ug/L		86	66 - 120
Aroclor-1260	5.00	4.04		ug/L		81	55 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*76*		*23 - 136*
DCB Decachlorobiphenyl	*66*		*10 - 130*

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 180-61561/1-A
Matrix: Water
Analysis Batch: 62592

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 61561

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.036	U	1.0	0.036	ug/L		01/21/13 13:44	01/30/13 20:50	1
Arsenic	0.29	U	1.0	0.29	ug/L		01/21/13 13:44	01/30/13 20:50	1
Barium	0.098	U	10	0.098	ug/L		01/21/13 13:44	01/30/13 20:50	1
Cadmium	0.11	U	1.0	0.11	ug/L		01/21/13 13:44	01/30/13 20:50	1
Chromium	0.54	U	2.0	0.54	ug/L		01/21/13 13:44	01/30/13 20:50	1
Sodium	36.9	J	100	3.8	ug/L		01/21/13 13:44	01/30/13 20:50	1
Nickel	0.17	U	1.0	0.17	ug/L		01/21/13 13:44	01/30/13 20:50	1
Lead	0.019	U	1.0	0.019	ug/L		01/21/13 13:44	01/30/13 20:50	1
Selenium	0.42	U	5.0	0.42	ug/L		01/21/13 13:44	01/30/13 20:50	1
Zinc	0.96	U	5.0	0.96	ug/L		01/21/13 13:44	01/30/13 20:50	1

Lab Sample ID: LCS 180-61561/2-A
Matrix: Water
Analysis Batch: 62592

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 61561

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	50.0	50.1		ug/L		100	80 - 120
Arsenic	40.0	37.1		ug/L		93	80 - 120
Barium	2000	1900		ug/L		95	80 - 120
Cadmium	50.0	51.4		ug/L		103	80 - 120
Chromium	200	199		ug/L		99	80 - 120
Sodium	50000	44000		ug/L		88	80 - 120

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 180-61561/2-A
Matrix: Water
Analysis Batch: 62592

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 61561

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nickel	500	467		ug/L		93	80 - 120
Lead	20.0	20.5		ug/L		103	80 - 120
Selenium	10.0	9.91		ug/L		99	80 - 120
Zinc	500	512		ug/L		102	80 - 120

Lab Sample ID: 240-20086-1 MS
Matrix: Water
Analysis Batch: 62592

Client Sample ID: MW-2
Prep Type: Dissolved
Prep Batch: 61561

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	0.036	U	50.0	49.0		ug/L		98	75 - 125
Arsenic	0.29	U	40.0	36.0		ug/L		90	75 - 125
Barium	77		2000	2000		ug/L		96	75 - 125
Cadmium	0.11	U	50.0	50.6		ug/L		101	75 - 125
Chromium	0.84	J	200	193		ug/L		96	75 - 125
Sodium	180000	B	50000	223000		ug/L		93	75 - 125
Nickel	0.17	U	500	446		ug/L		89	75 - 125
Lead	0.020	J	20.0	20.8		ug/L		104	75 - 125
Selenium	1.0	J	10.0	10.7		ug/L		97	75 - 125
Zinc	3.8	J	500	474		ug/L		94	75 - 125

Lab Sample ID: 240-20086-1 MSD
Matrix: Water
Analysis Batch: 62592

Client Sample ID: MW-2
Prep Type: Dissolved
Prep Batch: 61561

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silver	0.036	U	50.0	47.8		ug/L		96	75 - 125	3	20
Arsenic	0.29	U	40.0	36.8		ug/L		92	75 - 125	2	20
Barium	77		2000	1950		ug/L		94	75 - 125	2	20
Cadmium	0.11	U	50.0	49.1		ug/L		98	75 - 125	3	20
Chromium	0.84	J	200	189		ug/L		94	75 - 125	2	20
Sodium	180000	B	50000	222000		ug/L		90	75 - 125	1	20
Nickel	0.17	U	500	438		ug/L		88	75 - 125	2	20
Lead	0.020	J	20.0	20.5		ug/L		103	75 - 125	2	20
Selenium	1.0	J	10.0	9.31		ug/L		83	75 - 125	14	20
Zinc	3.8	J	500	465		ug/L		92	75 - 125	2	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-61535/1-A
Matrix: Water
Analysis Batch: 61592

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 61535

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038	U	0.20	0.038	ug/L		01/21/13 11:49	01/21/13 16:26	1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 180-61535/2-A
Matrix: Water
Analysis Batch: 61592

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 61535

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.52		ug/L		101	80 - 120

Lab Sample ID: 240-20086-2 MS
Matrix: Water
Analysis Batch: 61592

Client Sample ID: MW-4
Prep Type: Dissolved
Prep Batch: 61535

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.038	U	1.00	1.01		ug/L		101	75 - 125

Lab Sample ID: 240-20086-2 MSD
Matrix: Water
Analysis Batch: 61592

Client Sample ID: MW-4
Prep Type: Dissolved
Prep Batch: 61535

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.038	U	1.00	1.01		ug/L		101	75 - 125	0	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 240-73216/3
Matrix: Water
Analysis Batch: 73216

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.10	U	1.0	0.10	mg/L			01/25/13 11:55	1

Lab Sample ID: LCS 240-73216/4
Matrix: Water
Analysis Batch: 73216

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.1		mg/L		102	90 - 110

Lab Sample ID: 240-20086-10 MS
Matrix: Water
Analysis Batch: 73216

Client Sample ID: STORMWATER-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	110		50.0	154		mg/L		95	80 - 120

GC/MS VOA

Analysis Batch: 72813

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-20086-8	MW-11	Total/NA	Water	8260B	
LCS 240-72813/4	Lab Control Sample	Total/NA	Water	8260B	
MB 240-72813/5	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 72939

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-20086-1	MW-2	Total/NA	Water	8260B	
240-20086-2	MW-4	Total/NA	Water	8260B	
240-20086-3	MW-5	Total/NA	Water	8260B	
240-20086-4	MW-6	Total/NA	Water	8260B	
240-20086-5	MW-8	Total/NA	Water	8260B	
240-20086-6	MW-9	Total/NA	Water	8260B	
240-20086-7	MW-10	Total/NA	Water	8260B	
LCS 240-72939/4	Lab Control Sample	Total/NA	Water	8260B	
MB 240-72939/5	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 73083

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-20086-9	P-3-15'	Total/NA	Water	8260B	
240-20086-10	STORMWATER-1	Total/NA	Water	8260B	
240-20086-11	TRIP BLANK	Total/NA	Water	8260B	
LCS 240-73083/4	Lab Control Sample	Total/NA	Water	8260B	
MB 240-73083/5	Method Blank	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 72694

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-20086-1	MW-2	Total/NA	Water	3520C	
240-20086-2	MW-4	Total/NA	Water	3520C	
240-20086-3	MW-5	Total/NA	Water	3520C	
240-20086-5	MW-8	Total/NA	Water	3520C	
240-20086-6	MW-9	Total/NA	Water	3520C	
240-20086-7	MW-10	Total/NA	Water	3520C	
240-20086-9	P-3-15'	Total/NA	Water	3520C	
240-20086-10	STORMWATER-1	Total/NA	Water	3520C	
LCS 240-72694/12-A	Lab Control Sample	Total/NA	Water	3520C	
MB 240-72694/11-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 72929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-20086-1	MW-2	Total/NA	Water	8270C	72694
240-20086-2	MW-4	Total/NA	Water	8270C	72694
240-20086-3	MW-5	Total/NA	Water	8270C	72694
240-20086-5	MW-8	Total/NA	Water	8270C	72694
240-20086-6	MW-9	Total/NA	Water	8270C	72694
240-20086-7	MW-10	Total/NA	Water	8270C	72694
240-20086-9	P-3-15'	Total/NA	Water	8270C	72694
240-20086-10	STORMWATER-1	Total/NA	Water	8270C	72694
LCS 240-72694/12-A	Lab Control Sample	Total/NA	Water	8270C	72694

GC/MS Semi VOA (Continued)

Analysis Batch: 72929 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-72694/11-A	Method Blank	Total/NA	Water	8270C	72694

GC Semi VOA

Prep Batch: 72692

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-20086-5	MW-8	Total/NA	Water	3520C	
240-20086-10	STORMWATER-1	Total/NA	Water	3520C	
LCS 240-72692/5-A	Lab Control Sample	Total/NA	Water	3520C	
MB 240-72692/4-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 72877

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-20086-5	MW-8	Total/NA	Water	8082	72692
240-20086-10	STORMWATER-1	Total/NA	Water	8082	72692
LCS 240-72692/5-A	Lab Control Sample	Total/NA	Water	8082	72692
MB 240-72692/4-A	Method Blank	Total/NA	Water	8082	72692

Metals

Prep Batch: 61535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-20086-1	MW-2	Dissolved	Water	7470A	
240-20086-2	MW-4	Dissolved	Water	7470A	
240-20086-2 MS	MW-4	Dissolved	Water	7470A	
240-20086-2 MSD	MW-4	Dissolved	Water	7470A	
240-20086-3	MW-5	Dissolved	Water	7470A	
240-20086-5	MW-8	Dissolved	Water	7470A	
240-20086-6	MW-9	Dissolved	Water	7470A	
240-20086-7	MW-10	Dissolved	Water	7470A	
240-20086-8	MW-11	Dissolved	Water	7470A	
240-20086-9	P-3-15'	Dissolved	Water	7470A	
240-20086-10	STORMWATER-1	Dissolved	Water	7470A	
LCS 180-61535/2-A	Lab Control Sample	Total/NA	Water	7470A	
MB 180-61535/1-A	Method Blank	Total/NA	Water	7470A	

Prep Batch: 61561

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-20086-1	MW-2	Dissolved	Water	3005A	
240-20086-1 MS	MW-2	Dissolved	Water	3005A	
240-20086-1 MSD	MW-2	Dissolved	Water	3005A	
240-20086-2	MW-4	Dissolved	Water	3005A	
240-20086-3	MW-5	Dissolved	Water	3005A	
240-20086-5	MW-8	Dissolved	Water	3005A	
240-20086-6	MW-9	Dissolved	Water	3005A	
240-20086-7	MW-10	Dissolved	Water	3005A	
240-20086-8	MW-11	Dissolved	Water	3005A	
240-20086-9	P-3-15'	Dissolved	Water	3005A	
240-20086-10	STORMWATER-1	Dissolved	Water	3005A	
LCS 180-61561/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Metals (Continued)

Prep Batch: 61561 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 180-61561/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 61592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-20086-1	MW-2	Dissolved	Water	7470A	61535
240-20086-2	MW-4	Dissolved	Water	7470A	61535
240-20086-2 MS	MW-4	Dissolved	Water	7470A	61535
240-20086-2 MSD	MW-4	Dissolved	Water	7470A	61535
240-20086-3	MW-5	Dissolved	Water	7470A	61535
240-20086-5	MW-8	Dissolved	Water	7470A	61535
240-20086-6	MW-9	Dissolved	Water	7470A	61535
240-20086-7	MW-10	Dissolved	Water	7470A	61535
240-20086-8	MW-11	Dissolved	Water	7470A	61535
240-20086-9	P-3-15'	Dissolved	Water	7470A	61535
240-20086-10	STORMWATER-1	Dissolved	Water	7470A	61535
LCS 180-61535/2-A	Lab Control Sample	Total/NA	Water	7470A	61535
MB 180-61535/1-A	Method Blank	Total/NA	Water	7470A	61535

Analysis Batch: 62592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-20086-1	MW-2	Dissolved	Water	6020	61561
240-20086-1 MS	MW-2	Dissolved	Water	6020	61561
240-20086-1 MSD	MW-2	Dissolved	Water	6020	61561
240-20086-2	MW-4	Dissolved	Water	6020	61561
240-20086-3	MW-5	Dissolved	Water	6020	61561
240-20086-5	MW-8	Dissolved	Water	6020	61561
240-20086-6	MW-9	Dissolved	Water	6020	61561
240-20086-7	MW-10	Dissolved	Water	6020	61561
240-20086-8	MW-11	Dissolved	Water	6020	61561
240-20086-9	P-3-15'	Dissolved	Water	6020	61561
240-20086-10	STORMWATER-1	Dissolved	Water	6020	61561
LCS 180-61561/2-A	Lab Control Sample	Total Recoverable	Water	6020	61561
MB 180-61561/1-A	Method Blank	Total Recoverable	Water	6020	61561

General Chemistry

Analysis Batch: 73216

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-20086-1	MW-2	Total/NA	Water	300.0	
240-20086-2	MW-4	Total/NA	Water	300.0	
240-20086-3	MW-5	Total/NA	Water	300.0	
240-20086-5	MW-8	Total/NA	Water	300.0	
240-20086-6	MW-9	Total/NA	Water	300.0	
240-20086-7	MW-10	Total/NA	Water	300.0	
240-20086-8	MW-11	Total/NA	Water	300.0	
240-20086-9	P-3-15'	Total/NA	Water	300.0	
240-20086-10	STORMWATER-1	Total/NA	Water	300.0	
240-20086-10 MS	STORMWATER-1	Total/NA	Water	300.0	
LCS 240-73216/4	Lab Control Sample	Total/NA	Water	300.0	
MB 240-73216/3	Method Blank	Total/NA	Water	300.0	

Lab Chronicle

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: MW-2

Lab Sample ID: 240-20086-1

Date Collected: 01/16/13 13:35

Matrix: Water

Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	72939	01/23/13 19:04	LE	TAL NC
Total/NA	Prep	3520C			72694	01/21/13 11:18	AC	TAL NC
Total/NA	Analysis	8270C		1	72929	01/23/13 19:05	JG	TAL NC
Dissolved	Prep	7470A			61535	01/21/13 11:49	JS	TAL PIT
Dissolved	Analysis	7470A		1	61592	01/21/13 16:34	JS	TAL PIT
Dissolved	Prep	3005A			61561	01/21/13 13:44	CH	TAL PIT
Dissolved	Analysis	6020		1	62592	01/30/13 21:10	BR	TAL PIT
Total/NA	Analysis	300.0		5	73216	01/25/13 15:56	JB	TAL NC

Client Sample ID: MW-4

Lab Sample ID: 240-20086-2

Date Collected: 01/15/13 13:10

Matrix: Water

Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	72939	01/23/13 19:26	LE	TAL NC
Total/NA	Prep	3520C			72694	01/21/13 11:18	AC	TAL NC
Total/NA	Analysis	8270C		1	72929	01/23/13 16:21	JG	TAL NC
Dissolved	Prep	7470A			61535	01/21/13 11:49	JS	TAL PIT
Dissolved	Analysis	7470A		1	61592	01/21/13 16:36	JS	TAL PIT
Dissolved	Prep	3005A			61561	01/21/13 13:44	CH	TAL PIT
Dissolved	Analysis	6020		1	62592	01/30/13 21:29	BR	TAL PIT
Total/NA	Analysis	300.0		10	73216	01/25/13 16:17	JB	TAL NC

Client Sample ID: MW-5

Lab Sample ID: 240-20086-3

Date Collected: 01/15/13 12:00

Matrix: Water

Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		3.33	72939	01/23/13 19:49	LE	TAL NC
Total/NA	Prep	3520C			72694	01/21/13 11:18	AC	TAL NC
Total/NA	Analysis	8270C		1	72929	01/23/13 15:10	JG	TAL NC
Dissolved	Prep	7470A			61535	01/21/13 11:49	JS	TAL PIT
Dissolved	Analysis	7470A		1	61592	01/21/13 16:41	JS	TAL PIT
Dissolved	Prep	3005A			61561	01/21/13 13:44	CH	TAL PIT
Dissolved	Analysis	6020		1	62592	01/30/13 21:34	BR	TAL PIT
Total/NA	Analysis	300.0		5	73216	01/25/13 16:37	JB	TAL NC

Client Sample ID: MW-6

Lab Sample ID: 240-20086-4

Date Collected: 01/16/13 11:40

Matrix: Water

Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	72939	01/23/13 20:11	LE	TAL NC

Client Sample ID: MW-8

Lab Sample ID: 240-20086-5

Date Collected: 01/15/13 15:18

Matrix: Water

Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	72939	01/23/13 20:33	LE	TAL NC
Total/NA	Prep	3520C			72694	01/21/13 11:18	AC	TAL NC
Total/NA	Analysis	8270C		1	72929	01/23/13 15:34	JG	TAL NC
Total/NA	Prep	3520C			72692	01/21/13 11:12	AC	TAL NC
Total/NA	Analysis	8082		1	72877	01/22/13 14:52	LH	TAL NC
Dissolved	Prep	7470A			61535	01/21/13 11:49	JS	TAL PIT
Dissolved	Analysis	7470A		1	61592	01/21/13 16:43	JS	TAL PIT
Dissolved	Prep	3005A			61561	01/21/13 13:44	CH	TAL PIT
Dissolved	Analysis	6020		1	62592	01/30/13 21:38	BR	TAL PIT
Total/NA	Analysis	300.0		10	73216	01/25/13 16:57	JB	TAL NC

Client Sample ID: MW-9

Lab Sample ID: 240-20086-6

Date Collected: 01/16/13 10:58

Matrix: Water

Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	72939	01/23/13 20:56	LE	TAL NC
Total/NA	Prep	3520C			72694	01/21/13 11:18	AC	TAL NC
Total/NA	Analysis	8270C		1	72929	01/23/13 15:57	JG	TAL NC
Dissolved	Prep	7470A			61535	01/21/13 11:49	JS	TAL PIT
Dissolved	Analysis	7470A		1	61592	01/21/13 16:49	JS	TAL PIT
Dissolved	Prep	3005A			61561	01/21/13 13:44	CH	TAL PIT
Dissolved	Analysis	6020		1	62592	01/30/13 21:43	BR	TAL PIT
Total/NA	Analysis	300.0		10	73216	01/25/13 17:17	JB	TAL NC

Client Sample ID: MW-10

Lab Sample ID: 240-20086-7

Date Collected: 01/16/13 12:00

Matrix: Water

Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	72939	01/23/13 21:18	LE	TAL NC
Total/NA	Prep	3520C			72694	01/21/13 11:18	AC	TAL NC
Total/NA	Analysis	8270C		1	72929	01/23/13 18:18	JG	TAL NC
Dissolved	Prep	7470A			61535	01/21/13 11:49	JS	TAL PIT
Dissolved	Analysis	7470A		1	61592	01/21/13 16:51	JS	TAL PIT

Client Sample ID: MW-10

Lab Sample ID: 240-20086-7

Date Collected: 01/16/13 12:00

Matrix: Water

Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			61561	01/21/13 13:44	CH	TAL PIT
Dissolved	Analysis	6020		1	62592	01/30/13 21:48	BR	TAL PIT
Total/NA	Analysis	300.0		20	73216	01/25/13 17:37	JB	TAL NC

Client Sample ID: MW-11

Lab Sample ID: 240-20086-8

Date Collected: 01/16/13 10:00

Matrix: Water

Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	72813	01/22/13 12:10	LE	TAL NC
Dissolved	Prep	7470A			61535	01/21/13 11:49	JS	TAL PIT
Dissolved	Analysis	7470A		1	61592	01/21/13 16:54	JS	TAL PIT
Dissolved	Prep	3005A			61561	01/21/13 13:44	CH	TAL PIT
Dissolved	Analysis	6020		1	62592	01/30/13 21:53	BR	TAL PIT
Total/NA	Analysis	300.0		20	73216	01/25/13 17:57	JB	TAL NC

Client Sample ID: P-3-15'

Lab Sample ID: 240-20086-9

Date Collected: 01/16/13 14:40

Matrix: Water

Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	73083	01/24/13 17:55	LE	TAL NC
Total/NA	Prep	3520C			72694	01/21/13 11:18	AC	TAL NC
Total/NA	Analysis	8270C		1	72929	01/23/13 19:28	JG	TAL NC
Dissolved	Prep	7470A			61535	01/21/13 11:49	JS	TAL PIT
Dissolved	Analysis	7470A		1	61592	01/21/13 16:56	JS	TAL PIT
Dissolved	Prep	3005A			61561	01/21/13 13:44	CH	TAL PIT
Dissolved	Analysis	6020		1	62592	01/30/13 22:07	BR	TAL PIT
Total/NA	Analysis	300.0		10	73216	01/25/13 18:18	JB	TAL NC

Client Sample ID: STORMWATER-1

Lab Sample ID: 240-20086-10

Date Collected: 01/16/13 15:20

Matrix: Water

Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	73083	01/24/13 18:18	LE	TAL NC
Total/NA	Prep	3520C			72694	01/21/13 11:18	AC	TAL NC
Total/NA	Analysis	8270C		1	72929	01/23/13 18:41	JG	TAL NC
Total/NA	Prep	3520C			72692	01/21/13 11:12	AC	TAL NC
Total/NA	Analysis	8082		1	72877	01/22/13 15:07	LH	TAL NC
Dissolved	Prep	7470A			61535	01/21/13 11:49	JS	TAL PIT
Dissolved	Analysis	7470A		1	61592	01/21/13 16:58	JS	TAL PIT

Lab Chronicle

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Client Sample ID: STORMWATER-1

Lab Sample ID: 240-20086-10

Date Collected: 01/16/13 15:20
Matrix: Water
Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			61561	01/21/13 13:44	CH	TAL PIT
Dissolved	Analysis	6020		1	62592	01/30/13 22:12	BR	TAL PIT
Total/NA	Analysis	300.0		1	73216	01/25/13 18:38	JB	TAL NC

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-20086-11

Date Collected: 01/15/13 00:00
Matrix: Water
Date Received: 01/18/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	73083	01/24/13 18:40	LE	TAL NC

Laboratory References:

TAL NC = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054001/02

TestAmerica Job ID: 240-20086-1

Laboratory: TestAmerica Canton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-13
Connecticut	State Program	1	PH-0590	12-31-13
Florida	NELAP	4	E87225	06-30-13
Georgia	State Program	4	N/A	06-30-13
Illinois	NELAP	5	200004	07-31-13
Kentucky	State Program	4	58	06-30-13
L-A-B	DoD ELAP		L2315	02-28-13
Nevada	State Program	9	OH-000482008A	07-31-13
New Jersey	NELAP	2	OH001	06-30-13
New York	NELAP	2	10975	04-01-13
Ohio VAP	State Program	5	CL0024	01-19-14
Pennsylvania	NELAP	3	68-00340	08-31-13
Texas	NELAP	6		08-03-13
USDA	Federal		P330-11-00328	08-26-14
Virginia	NELAP	3	460175	09-14-13
Wisconsin	State Program	5	999518190	08-31-13

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-13
California	NELAP	9	4224CA	03-31-13
Connecticut	State Program	1	PH-0688	09-30-14
Florida	NELAP	4	E871008	06-30-13
Illinois	NELAP	5	002602	06-30-13
L-A-B	DoD ELAP		L2314	02-24-13
Louisiana	NELAP	6	04041	06-30-13
New Hampshire	NELAP	1	203011	04-04-13
New Jersey	NELAP	2	PA005	06-30-13
New York	NELAP	2	11182	04-01-13
North Carolina DENR	State Program	4	434	12-31-13
Pennsylvania	NELAP	3	02-00416	04-30-13
South Carolina	State Program	4	89014	04-30-13
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P-Soil-01	04-16-15
USDA	Federal		P330-10-00139	04-28-13
Utah	NELAP	8	STLP	04-30-13
Virginia	NELAP	3	460189	09-14-13
Wisconsin	State Program	5	998027800	08-31-13

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: _____
Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other _____

TestAmerica Laboratories, Inc.

Client Contact				
Company Name: Tetra Tech	Client Project Manager: Patti McCall	Site Contact: Patti McCall	Lab Contact: Kris Brooks	COC No: 054624
Address: 710 Avis Dr.	Telephone: (734)213-4069	Telephone: (734)213-4069	Telephone: 330-966-9790	1 of 1 COCs
City/State/Zip: Ann Arbor, MI 48108	Email: patti.mccall@tetratech.com	Analysis Turnaround Time (in BUS days): TAT if different from below: Standard ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		For lab use only: Walk in client ☐ Lab pickup ☐ Lab sampling ☐ Job/SDG No:
Phone: (734)213-4069				
Project Name: 415 West Washington	Method of Shipment/Carrier: —			
Project Number: 117-1054011/02	Shipping/Tracking No:			
PO# —				

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite C / Grab G	PNAs ~~(8260)~~ ADR	Chloride	Metals (Dissolved)	Sodium	VOCs (8260)	PCBs					Sample Specific Notes / Special Instructions:
MW-2	1/16/13	13:35		X					1	3			3		Y	G	X	X	X	X	X						*diss. metals
MW-4	1/15/13	13:10		X					1	3			3		Y	G	X	X	X	X	X						field filtered
MW-5	1/15/13	12:00		X					1	3			3		Y	G	X	X	X	X	X						Metals=
MW-6	1/16/13	11:40		X						3					N	G					X						Michigan 10
MW-8	1/15/13	15:18		X					1	3			5		Y	G	X	X	X	X	X	X					and mercury
MW-9	1/16/13	10:58		X					1	3			3		Y	G	X	X	X	X	X						
MW-10	1/16/13	12:00		X					1	3			3		Y	G	X	X	X	X	X						
MW-11	1/16/13	10:00		X					1	3			1		Y	G		X	X		X						
P-3-15'	1/16/13	14:40		X					1	3			3		Y	G	X	X	X	X	X						
Stormwater-1	1/16/13	15:20		X					1	3			5		Y	G	X	X	X	X	X	X					
Trip Blank	—	—		X						1					—						X						

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☒ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Alison Rowan	Tt	1/16/13 17:30	Tt Cold Storage	Tt	1/16/13 17:30
Tt Cold Storage	Tt	1/17/13 8:41	Patti J. McCall	Tt	1/17/13 8:41
Patti J. McCall	Tt	1/17/13 8:41	Received in Laboratory by: [signature]	TEST AMERICA	1/17/13 8:41

[signature] TAL 1/18/13 9:15

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RELINQUISHED BY: [signature] 1/17/13 15:58

TAL 0018-1 (04/10)

1/31/2013

TestAmerica Canton Sample Receipt Form/Narrative Login # : 20086

Client Tetra Tech Site Name _____ By: _____

Cooler Received on 1-18-13 Opened on 1-18-13 (Signature)

FedEx: 1st Grd Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt

IR GUN# 1	(CF –2 °C) Observed Sample Temp._____°C	Corrected Sample Temp._____°C	
IR GUN# 4G	(CF 0 °C) Observed Sample Temp._____°C	Corrected Sample Temp._____°C	☒ Multiple on Back
IR GUN# 5G	(CF 0 °C) Observed Sample Temp._____°C	Corrected Sample Temp._____°C	
IR GUN# 8	(CF 0 °C) Observed Sample Temp._____°C	Corrected Sample Temp._____°C	

2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 3	Yes	No
-Were custody seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were custody seals on the bottle(s)?	Yes	No
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Did all bottles arrive in good condition (Unbroken)? 1/19 CL	Yes	No
7. Could all bottle labels be reconciled with the COC?	Yes	No
8. Were correct bottle(s) used for the test(s) indicated?	Yes	No
9. Sufficient quantity received to perform indicated analyses?	Yes	No
10. Were sample(s) at the correct pH upon receipt?	Yes	No NA
11. Were VOAs on the COC?	Yes	No
12. Were air bubbles >6 mm in any VOA vials?	Yes	No NA
13. Was a trip blank present in the cooler(s)?	Yes	No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

15. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) 1 x L Storm water - 1 were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in Sample Receiving to meet recommended pH level(s). Nitric Acid Lot# 031512-HNO3; Sulfuric Acid Lot# 051012-H2SO4; Sodium Hydroxide Lot# 121809 -NaOH; Hydrochloric Acid Lot# 041911-HCl; Sodium Hydroxide and Zinc Acetate Lot# 100108-(CH3COO)2ZN/NaOH. What time was preservative added to sample(s)? _____

Client ID	pH	Date	Initials
2	<2	1-18/13	CSL
4	<2		
5	<2		
8	<2		
9	<2		
10	<2		
11	<2		
3-15	<2		
STORM	<2		

Cooler #	Observed Sample Temp. °C	Corrected Sample Temp. °C	IR #	Coolant
Client	2.8	2.8	8	Ice
Client	3.1	3.1	1	1
Client	2.5	2.5	1	1

Login Sample Receipt Checklist

Client: Tetra Tech GEO

Job Number: 240-20086-1

Login Number: 20086
List Number: 1
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 01/19/13 11:24 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Received extra samples not listed on COC.
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-21427-1
Client Project/Site: 415 W Washington Phase II

For:
Tetra Tech GEO
710 Avis Drive
Ann Arbor, Michigan 48108

Attn: Patti McCall

Kris Brooks

Authorized for release by:
3/7/2013 8:42:19 PM

Kris Brooks
Project Manager II
kris.brooks@testamericainc.com

LINKS

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Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate is outside control limits
B	Compound was found in the blank and sample.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.
E	Result exceeded calibration range.
X	Surrogate is outside control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 240-21427-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: Tetra Tech GEO

Project: 415 W Washington Phase II

Report Number: 240-21427-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 02/26/2013; the samples arrived in good condition, properly preserved and on ice. The temperature of the cooler at receipt was 3.8 C.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples SB-1-13-2.5' (240-21427-1), SB-1-13-5' (240-21427-2), SB-3-13-5' (240-21427-3), SB-5-13-4.5-5' (240-21427-4), TW-2-13-6' (240-21427-5), MW-6R-13(10') (240-21427-8), MW-6R-13(11') (240-21427-9) and MW-13-13(8') (240-21427-10) were analyzed for volatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were prepared on 02/27/2013 and analyzed on 02/28/2013 and 03/01/2013.

1,2,4-Trichlorobenzene and Methylcyclohexane were detected in method blank MB 240-76655/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged "J". If the associated sample reported a result above the MDL and/or RL, the result has been "B" flagged. Refer to the QC report for details.

1,2-Dichloroethane-d4 (Surr), 4-Bromofluorobenzene (Surr), Dibromofluoromethane (Surr) and Toluene-d8 (Surr) failed the surrogate recovery criteria low for MW-6R-13(10') (240-21427-8). Refer to the QC report for details.

Samples MW-6R-13(10') (240-21427-8)[33.33X] and MW-6R-13(11') (240-21427-9)[6.67X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Job ID: 240-21427-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

No other difficulties were encountered during the VOCs analyses. All other quality control parameters were within the acceptance limits.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples TW-1-13 (240-21427-6), TW-2-13 (240-21427-7) and TRIP BLANK (240-21427-11) were analyzed for volatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 03/04/2013.

1,2,4-Trichlorobenzene was detected in method blank MB 240-77112/5 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged “J”. If the associated sample reported a result above the MDL and/or RL, the result has been “B” flagged. Refer to the QC report for details.

Samples TW-1-13 (240-21427-6)[5X] and TW-2-13 (240-21427-7)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the VOCs analyses. All other quality control parameters were within the acceptance limits.

SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples SB-1-13-2.5' (240-21427-1), SB-1-13-5' (240-21427-2), SB-3-13-5' (240-21427-3), SB-5-13-4.5-5' (240-21427-4) and MW-6R-13(10') (240-21427-8) were analyzed for semivolatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8270C. The samples were prepared on 02/28/2013 and analyzed on 03/04/2013 and 03/05/2013.

Surrogates are added during the extraction process prior to dilution. When the sample is diluted, surrogate recoveries are diluted out and no corrective action is required.

Nitrobenzene-d5 (Surr) and Nitrobenzene-d5 (Surr) failed the surrogate recovery criteria high for MW-6R-13(10') (240-21427-8). Refer to the QC report for details.

Several analytes failed the recovery criteria high for the MSD of sample 240-21446-4 in batch 240-77119. Refer to the QC report for details.

Samples SB-1-13-2.5' (240-21427-1)[50X], SB-5-13-4.5-5' (240-21427-4)[2.5X] and MW-6R-13(10') (240-21427-8)[4X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The following sample(s) contained one acid and/or one base surrogate outside acceptance limits: MW-6R-13(10') (240-21427-8). The laboratory's SOP allows one acid surrogate and/or one base surrogate to be outside acceptance limits; therefore, re-extraction/re-analysis was not performed. These results have been reported and qualified.

The laboratory control sample for batch 76773 exceeded control limits for the following analyte(s): 3,3'-Dichlorobenzidine. This compound has been identified as a poor performing analyte when analyzed using this method; therefore, re-extraction/re-analysis was not performed. These results have been reported and qualified.

The following sample(s) was diluted due to the nature of the sample matrix: SB-5-13-4.5-5' (240-21427-4). Elevated reporting limits (RLs) are provided.

No other difficulties were encountered during the SVOCs analyses. All other quality control parameters were within the acceptance limits.

PERCENT SOLIDS

Samples SB-1-13-2.5' (240-21427-1), SB-1-13-5' (240-21427-2), SB-3-13-5' (240-21427-3), SB-5-13-4.5-5' (240-21427-4), TW-2-13-6' (240-21427-5), MW-6R-13(10') (240-21427-8), MW-6R-13(11') (240-21427-9) and MW-13-13(8') (240-21427-10) were analyzed for percent solids in accordance with EPA Method 160.3 MOD. The samples were analyzed on 02/28/2013.

Percent Moisture exceeded the rpd limit for the duplicate of sample SB-1-13-2.5'DU (240-21427-1). Refer to the QC report for details.

No other difficulties were encountered during the % solids analyses. All other quality control parameters were within the acceptance limits.

Method Summary

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL NC
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL NC
Moisture	Percent Moisture	EPA	TAL NC

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL NC = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-21427-1	SB-1-13-2.5'	Solid	02/24/13 09:05	02/26/13 09:15
240-21427-2	SB-1-13-5'	Solid	02/24/13 09:08	02/26/13 09:15
240-21427-3	SB-3-13-5'	Solid	02/24/13 10:00	02/26/13 09:15
240-21427-4	SB-5-13-4.5-5'	Solid	02/24/13 10:45	02/26/13 09:15
240-21427-5	TW-2-13-6'	Solid	02/24/13 12:30	02/26/13 09:15
240-21427-6	TW-1-13	Water	02/24/13 13:05	02/26/13 09:15
240-21427-7	TW-2-13	Water	02/24/13 15:35	02/26/13 09:15
240-21427-8	MW-6R-13(10')	Solid	02/24/13 09:40	02/26/13 09:15
240-21427-9	MW-6R-13(11')	Solid	02/24/13 11:30	02/26/13 09:15
240-21427-10	MW-13-13(8')	Solid	02/24/13 15:00	02/26/13 09:15
240-21427-11	TRIP BLANK	Water	02/24/13 00:00	02/26/13 09:15

Detection Summary

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: SB-1-13-2.5' — Lab Sample ID: 240-21427-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]anthracene	33000		17000	210	ug/Kg	50	☼	8270C	Total/NA
Benzo[a]pyrene	29000		17000	210	ug/Kg	50	☼	8270C	Total/NA
Benzo[b]fluoranthene	35000		17000	210	ug/Kg	50	☼	8270C	Total/NA
Benzo[g,h,i]perylene	10000	J	17000	210	ug/Kg	50	☼	8270C	Total/NA
Benzo[k]fluoranthene	13000	J	17000	210	ug/Kg	50	☼	8270C	Total/NA
Anthracene	19000		17000	210	ug/Kg	50	☼	8270C	Total/NA
Chrysene	30000		17000	70	ug/Kg	50	☼	8270C	Total/NA
Dibenz(a,h)anthracene	3800	J	17000	210	ug/Kg	50	☼	8270C	Total/NA
Fluoranthene	66000		17000	210	ug/Kg	50	☼	8270C	Total/NA
Fluorene	8700	J	17000	210	ug/Kg	50	☼	8270C	Total/NA
Indeno[1,2,3-cd]pyrene	12000	J	17000	210	ug/Kg	50	☼	8270C	Total/NA
Phenanthrene	63000		17000	210	ug/Kg	50	☼	8270C	Total/NA
Pyrene	52000		17000	210	ug/Kg	50	☼	8270C	Total/NA
Acenaphthene	1400	J	17000	210	ug/Kg	50	☼	8270C	Total/NA
Acenaphthylene	7500	J	17000	210	ug/Kg	50	☼	8270C	Total/NA
Naphthalene	3200	J	17000	210	ug/Kg	50	☼	8270C	Total/NA
2-Methylnaphthalene	2500	J	17000	210	ug/Kg	50	☼	8270C	Total/NA

Client Sample ID: SB-1-13-5' — Lab Sample ID: 240-21427-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]anthracene	58	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
Benzo[a]pyrene	56	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
Benzo[b]fluoranthene	89	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
Benzo[g,h,i]perylene	41	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
Benzo[k]fluoranthene	19	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
Anthracene	17	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
Chrysene	59	J	330	1.4	ug/Kg	1	☼	8270C	Total/NA
Fluoranthene	100	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
Fluorene	7.1	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
Indeno[1,2,3-cd]pyrene	33	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
Phenanthrene	63	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
Pyrene	86	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
Acenaphthylene	10	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
Naphthalene	11	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA
2-Methylnaphthalene	6.7	J	330	4.2	ug/Kg	1	☼	8270C	Total/NA

Client Sample ID: SB-3-13-5' — Lab Sample ID: 240-21427-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]pyrene	9.9	J	300	3.7	ug/Kg	1	☼	8270C	Total/NA
Benzo[b]fluoranthene	20	J	300	3.7	ug/Kg	1	☼	8270C	Total/NA
Benzo[g,h,i]perylene	18	J	300	3.7	ug/Kg	1	☼	8270C	Total/NA
Benzo[k]fluoranthene	6.9	J	300	3.7	ug/Kg	1	☼	8270C	Total/NA
Fluoranthene	11	J	300	3.7	ug/Kg	1	☼	8270C	Total/NA
Indeno[1,2,3-cd]pyrene	12	J	300	3.7	ug/Kg	1	☼	8270C	Total/NA
Pyrene	9.5	J	300	3.7	ug/Kg	1	☼	8270C	Total/NA

Client Sample ID: SB-5-13-4.5-5' — Lab Sample ID: 240-21427-4

This Detection Summary does not include radiochemical test results.

Client Sample ID: SB-5-13-4.5-5' (Continued) — Lab Sample ID: 240-21427-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]anthracene	61	J	760	9.5	ug/Kg	2.5	☼	8270C	Total/NA
Benzo[a]pyrene	89	J	760	9.5	ug/Kg	2.5	☼	8270C	Total/NA
Benzo[b]fluoranthene	120	J	760	9.5	ug/Kg	2.5	☼	8270C	Total/NA
Benzo[g,h,i]perylene	58	J	760	9.5	ug/Kg	2.5	☼	8270C	Total/NA
Benzo[k]fluoranthene	69	J	760	9.5	ug/Kg	2.5	☼	8270C	Total/NA
Anthracene	15	J	760	9.5	ug/Kg	2.5	☼	8270C	Total/NA
Chrysene	94	J	760	3.2	ug/Kg	2.5	☼	8270C	Total/NA
Fluoranthene	95	J	760	9.5	ug/Kg	2.5	☼	8270C	Total/NA
Phenanthrene	42	J	760	9.5	ug/Kg	2.5	☼	8270C	Total/NA
Pyrene	95	J	760	9.5	ug/Kg	2.5	☼	8270C	Total/NA
2-Methylnaphthalene	12	J	760	9.5	ug/Kg	2.5	☼	8270C	Total/NA

Client Sample ID: TW-2-13-6' — Lab Sample ID: 240-21427-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Tetrachloroethene	68		42	13	ug/Kg	1	☼	8260B	Total/NA
Trichloroethene	190		42	10	ug/Kg	1	☼	8260B	Total/NA

Client Sample ID: TW-1-13 — Lab Sample ID: 240-21427-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Carbon tetrachloride	0.98	J	5.0	0.65	ug/L	5		8260B	Total/NA
Chloroform	3.1	J	5.0	0.80	ug/L	5		8260B	Total/NA
Trichloroethene	120		5.0	0.85	ug/L	5		8260B	Total/NA
1,1,1-Trichloroethane	15		5.0	1.1	ug/L	5		8260B	Total/NA

Client Sample ID: TW-2-13 — Lab Sample ID: 240-21427-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Carbon tetrachloride	0.83	J	5.0	0.65	ug/L	5		8260B	Total/NA
Chloroform	2.3	J	5.0	0.80	ug/L	5		8260B	Total/NA
Trichloroethene	130		5.0	0.85	ug/L	5		8260B	Total/NA
1,1,1-Trichloroethane	15		5.0	1.1	ug/L	5		8260B	Total/NA

Client Sample ID: MW-6R-13(10') — Lab Sample ID: 240-21427-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	2200		1500	210	ug/Kg	33.333	☼	8260B	Total/NA
Xylenes, Total	8800		4600	310	ug/Kg	33.333	☼	8260B	Total/NA
Cyclohexane	7200	J	37000	1500	ug/Kg	33.333	☼	8260B	Total/NA
Isopropylbenzene	1800	J	7700	250	ug/Kg	33.333	☼	8260B	Total/NA
Methylcyclohexane	44000	B	37000	460	ug/Kg	33.333	☼	8260B	Total/NA
Benzo[a]anthracene	22	J	300	3.8	ug/Kg	1	☼	8270C	Total/NA
Benzo[a]pyrene	20	J	300	3.8	ug/Kg	1	☼	8270C	Total/NA
Benzo[b]fluoranthene	20	J	300	3.8	ug/Kg	1	☼	8270C	Total/NA
Benzo[g,h,i]perylene	11	J	300	3.8	ug/Kg	1	☼	8270C	Total/NA
Benzo[k]fluoranthene	7.7	J	300	3.8	ug/Kg	1	☼	8270C	Total/NA
Anthracene	14	J	300	3.8	ug/Kg	1	☼	8270C	Total/NA
Chrysene	18	J	300	1.3	ug/Kg	1	☼	8270C	Total/NA
Fluoranthene	48	J	300	3.8	ug/Kg	1	☼	8270C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-6R-13(10') (Continued) — Lab Sample ID: 240-21427-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluorene	18	J	300	3.8	ug/Kg	1	☼	8270C	Total/NA
Indeno[1,2,3-cd]pyrene	6.3	J	300	3.8	ug/Kg	1	☼	8270C	Total/NA
Phenanthrene	51	J	300	3.8	ug/Kg	1	☼	8270C	Total/NA
Pyrene	44	J	300	3.8	ug/Kg	1	☼	8270C	Total/NA
Acenaphthene	27	J	300	3.8	ug/Kg	1	☼	8270C	Total/NA
Naphthalene	1600		300	3.8	ug/Kg	1	☼	8270C	Total/NA
2-Methylnaphthalene	3500	E	300	3.8	ug/Kg	1	☼	8270C	Total/NA
Benzo[a]anthracene - RA	27	J	1200	15	ug/Kg	4	☼	8270C	Total/NA
Benzo[a]pyrene - RA	16	J	1200	15	ug/Kg	4	☼	8270C	Total/NA
Benzo[b]fluoranthene - RA	16	J	1200	15	ug/Kg	4	☼	8270C	Total/NA
Anthracene - RA	16	J	1200	15	ug/Kg	4	☼	8270C	Total/NA
Chrysene - RA	21	J	1200	5.0	ug/Kg	4	☼	8270C	Total/NA
Fluoranthene - RA	48	J	1200	15	ug/Kg	4	☼	8270C	Total/NA
Fluorene - RA	22	J	1200	15	ug/Kg	4	☼	8270C	Total/NA
Phenanthrene - RA	48	J	1200	15	ug/Kg	4	☼	8270C	Total/NA
Pyrene - RA	41	J	1200	15	ug/Kg	4	☼	8270C	Total/NA
Acenaphthene - RA	32	J	1200	15	ug/Kg	4	☼	8270C	Total/NA
Naphthalene - RA	1700		1200	15	ug/Kg	4	☼	8270C	Total/NA
2-Methylnaphthalene - RA	3600		1200	15	ug/Kg	4	☼	8270C	Total/NA

Client Sample ID: MW-6R-13(11') — Lab Sample ID: 240-21427-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	280	J	300	91	ug/Kg	6.667	☼	8260B	Total/NA
Ethylbenzene	4600		300	41	ug/Kg	6.667	☼	8260B	Total/NA
Toluene	580	J	610	130	ug/Kg	6.667	☼	8260B	Total/NA
Xylenes, Total	43000		910	61	ug/Kg	6.667	☼	8260B	Total/NA
Cyclohexane	1700	J	7300	300	ug/Kg	6.667	☼	8260B	Total/NA
Isopropylbenzene	1500		1500	49	ug/Kg	6.667	☼	8260B	Total/NA
Methyl acetate	410	J	7300	190	ug/Kg	6.667	☼	8260B	Total/NA
Methylcyclohexane	16000	B	7300	91	ug/Kg	6.667	☼	8260B	Total/NA

Client Sample ID: MW-13-13(8') — Lab Sample ID: 240-21427-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	40	J	76	18	ug/Kg	1	☼	8260B	Total/NA

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-21427-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	7.9	J	10	1.1	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: SB-1-13-2.5'
Date Collected: 02/24/13 09:05
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-1
Matrix: Solid
Percent Solids: 79.1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	210	U	760	210	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Benzene	15	U	50	15	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Bromodichloromethane	12	U	100	12	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Bromoform	24	U	100	24	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Bromomethane	37	U	250	37	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
2-Butanone (MEK)	54	U	760	54	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Carbon disulfide	15	U	250	15	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Carbon tetrachloride	8.1	U	50	8.1	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Chlorobenzene	8.1	U	50	8.1	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Chloroethane	77	U	250	77	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Chloroform	11	U	50	11	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Chloromethane	18	U	250	18	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,1-Dichloroethane	21	U	50	21	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,2-Dichloroethane	13	U	50	13	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,1-Dichloroethene	23	U	50	23	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,2-Dichloropropane	10	U	50	10	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
cis-1,3-Dichloropropene	10	U	50	10	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
trans-1,3-Dichloropropene	25	U	50	25	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Ethylbenzene	6.8	U	50	6.8	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
2-Hexanone	25	U	2500	25	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Methylene Chloride	97	U	250	97	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
4-Methyl-2-pentanone (MIBK)	60	U	2500	60	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Styrene	7.1	U	50	7.1	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,1,2,2-Tetrachloroethane	11	U	50	11	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Tetrachloroethene	15	U	50	15	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Toluene	21	U	100	21	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Trichloroethene	12	U	50	12	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Vinyl chloride	23	U	40	23	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Xylenes, Total	10	U	150	10	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,1,1-Trichloroethane	26	U	50	26	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,1,2-Trichloroethane	15	U	50	15	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Cyclohexane	50	U	1200	50	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,2-Dibromo-3-Chloropropane	63	U	250	63	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,2-Dibromoethane	13	U	250	13	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Dichlorodifluoromethane	20	U	100	20	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
cis-1,2-Dichloroethene	8.7	U	50	8.7	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
trans-1,2-Dichloroethene	12	U	50	12	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Isopropylbenzene	8.2	U	250	8.2	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Methyl acetate	32	U	1200	32	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Methyl tert-butyl ether	8.9	U	250	8.9	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,1,2-Trichloro-1,2,2-trifluoroethane	49	U	250	49	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,2,4-Trichlorobenzene	9.2	U	250	9.2	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,2-Dichlorobenzene	11	U	100	11	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,3-Dichlorobenzene	6.0	U	100	6.0	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
1,4-Dichlorobenzene	10	U	100	10	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Trichlorofluoromethane	20	U	100	20	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Dibromochloromethane	15	U	50	15	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1
Methylcyclohexane	15	U	1200	15	ug/Kg	☼	02/27/13 12:14	02/28/13 14:38	1

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: SB-1-13-2.5'
Date Collected: 02/24/13 09:05
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-1
Matrix: Solid
Percent Solids: 79.1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	75		39 - 128	02/27/13 12:14	02/28/13 14:38	1
4-Bromofluorobenzene (Surr)	69		26 - 141	02/27/13 12:14	02/28/13 14:38	1
Toluene-d8 (Surr)	76		33 - 134	02/27/13 12:14	02/28/13 14:38	1
Dibromofluoromethane (Surr)	76		30 - 122	02/27/13 12:14	02/28/13 14:38	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	33000		17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Benzo[a]pyrene	29000		17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Benzo[b]fluoranthene	35000		17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Benzo[g,h,i]perylene	10000	J	17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Benzo[k]fluoranthene	13000	J	17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Anthracene	19000		17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Chrysene	30000		17000	70	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Dibenz(a,h)anthracene	3800	J	17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Fluoranthene	66000		17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Fluorene	8700	J	17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Indeno[1,2,3-cd]pyrene	12000	J	17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Phenanthrene	63000		17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Pyrene	52000		17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Acenaphthene	1400	J	17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Acenaphthylene	7500	J	17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
Naphthalene	3200	J	17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50
2-Methylnaphthalene	2500	J	17000	210	ug/Kg	☼	02/28/13 09:45	03/04/13 23:43	50

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	69		24 - 110	02/28/13 09:45	03/04/13 23:43	50
2-Fluorophenol (Surr)	50		24 - 110	02/28/13 09:45	03/04/13 23:43	50
2,4,6-Tribromophenol (Surr)	42		10 - 110	02/28/13 09:45	03/04/13 23:43	50
Nitrobenzene-d5 (Surr)	63		20 - 110	02/28/13 09:45	03/04/13 23:43	50
Phenol-d5 (Surr)	53		26 - 110	02/28/13 09:45	03/04/13 23:43	50
Terphenyl-d14 (Surr)	87		36 - 110	02/28/13 09:45	03/04/13 23:43	50

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: SB-1-13-5'
Date Collected: 02/24/13 09:08
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-2
Matrix: Solid
Percent Solids: 79.3

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	210	U	760	210	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Benzene	15	U	50	15	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Bromodichloromethane	12	U	100	12	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Bromoform	24	U	100	24	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Bromomethane	37	U	250	37	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
2-Butanone (MEK)	54	U	760	54	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Carbon disulfide	15	U	250	15	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Carbon tetrachloride	8.1	U	50	8.1	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Chlorobenzene	8.1	U	50	8.1	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Chloroethane	77	U	250	77	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Chloroform	11	U	50	11	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Chloromethane	18	U	250	18	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,1-Dichloroethane	21	U	50	21	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,2-Dichloroethane	13	U	50	13	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,1-Dichloroethene	23	U	50	23	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,2-Dichloropropane	10	U	50	10	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
cis-1,3-Dichloropropene	9.9	U	50	9.9	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
trans-1,3-Dichloropropene	25	U	50	25	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Ethylbenzene	6.8	U	50	6.8	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
2-Hexanone	25	U	2500	25	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Methylene Chloride	97	U	250	97	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
4-Methyl-2-pentanone (MIBK)	60	U	2500	60	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Styrene	7.1	U	50	7.1	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,1,2,2-Tetrachloroethane	11	U	50	11	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Tetrachloroethene	15	U	50	15	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Toluene	21	U	100	21	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Trichloroethene	12	U	50	12	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Vinyl chloride	23	U	40	23	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Xylenes, Total	10	U	150	10	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,1,1-Trichloroethane	26	U	50	26	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,1,2-Trichloroethane	15	U	50	15	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Cyclohexane	50	U	1200	50	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,2-Dibromo-3-Chloropropane	63	U	250	63	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,2-Dibromoethane	13	U	250	13	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Dichlorodifluoromethane	20	U	100	20	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
cis-1,2-Dichloroethene	8.7	U	50	8.7	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
trans-1,2-Dichloroethene	12	U	50	12	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Isopropylbenzene	8.2	U	250	8.2	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Methyl acetate	31	U	1200	31	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Methyl tert-butyl ether	8.9	U	250	8.9	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,1,2-Trichloro-1,2,2-trifluoroethane	49	U	250	49	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,2,4-Trichlorobenzene	9.2	U	250	9.2	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,2-Dichlorobenzene	11	U	100	11	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,3-Dichlorobenzene	6.0	U	100	6.0	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
1,4-Dichlorobenzene	10	U	100	10	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Trichlorofluoromethane	20	U	100	20	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Dibromochloromethane	15	U	50	15	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1
Methylcyclohexane	15	U	1200	15	ug/Kg	☼	02/27/13 12:14	02/28/13 15:05	1

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: SB-1-13-5'
Date Collected: 02/24/13 09:08
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-2
Matrix: Solid
Percent Solids: 79.3

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	73		39 - 128	02/27/13 12:14	02/28/13 15:05	1
4-Bromofluorobenzene (Surr)	67		26 - 141	02/27/13 12:14	02/28/13 15:05	1
Toluene-d8 (Surr)	77		33 - 134	02/27/13 12:14	02/28/13 15:05	1
Dibromofluoromethane (Surr)	76		30 - 122	02/27/13 12:14	02/28/13 15:05	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	58	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Benzo[a]pyrene	56	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Benzo[b]fluoranthene	89	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Benzo[g,h,i]perylene	41	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Benzo[k]fluoranthene	19	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Anthracene	17	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Chrysene	59	J	330	1.4	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Dibenz(a,h)anthracene	4.2	U	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Fluoranthene	100	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Fluorene	7.1	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Indeno[1,2,3-cd]pyrene	33	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Phenanthrene	63	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Pyrene	86	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Acenaphthene	4.2	U	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Acenaphthylene	10	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
Naphthalene	11	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1
2-Methylnaphthalene	6.7	J	330	4.2	ug/Kg	☼	02/28/13 09:45	03/04/13 20:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	64		24 - 110	02/28/13 09:45	03/04/13 20:11	1
2-Fluorophenol (Surr)	57		24 - 110	02/28/13 09:45	03/04/13 20:11	1
2,4,6-Tribromophenol (Surr)	44		10 - 110	02/28/13 09:45	03/04/13 20:11	1
Nitrobenzene-d5 (Surr)	63		20 - 110	02/28/13 09:45	03/04/13 20:11	1
Phenol-d5 (Surr)	56		26 - 110	02/28/13 09:45	03/04/13 20:11	1
Terphenyl-d14 (Surr)	82		36 - 110	02/28/13 09:45	03/04/13 20:11	1

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: SB-3-13-5'
Date Collected: 02/24/13 10:00
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-3
Matrix: Solid
Percent Solids: 88.5

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	190	U	680	190	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Benzene	14	U	45	14	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Bromodichloromethane	11	U	91	11	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Bromoform	22	U	91	22	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Bromomethane	33	U	230	33	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
2-Butanone (MEK)	49	U	680	49	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Carbon disulfide	14	U	230	14	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Carbon tetrachloride	7.2	U	45	7.2	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Chlorobenzene	7.2	U	45	7.2	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Chloroethane	69	U	230	69	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Chloroform	10	U	45	10	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Chloromethane	16	U	230	16	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,1-Dichloroethane	19	U	45	19	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,2-Dichloroethane	11	U	45	11	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,1-Dichloroethene	20	U	45	20	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,2-Dichloropropane	9.3	U	45	9.3	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
cis-1,3-Dichloropropene	8.9	U	45	8.9	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
trans-1,3-Dichloropropene	23	U	45	23	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Ethylbenzene	6.1	U	45	6.1	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
2-Hexanone	23	U	2300	23	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Methylene Chloride	87	U	230	87	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
4-Methyl-2-pentanone (MIBK)	54	U	2300	54	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Styrene	6.3	U	45	6.3	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,1,2,2-Tetrachloroethane	10	U	45	10	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Tetrachloroethene	14	U	45	14	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Toluene	19	U	91	19	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Trichloroethene	11	U	45	11	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Vinyl chloride	20	U	36	20	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Xylenes, Total	9.2	U	140	9.2	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,1,1-Trichloroethane	24	U	45	24	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,1,2-Trichloroethane	14	U	45	14	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Cyclohexane	45	U	1100	45	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,2-Dibromo-3-Chloropropane	57	U	230	57	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,2-Dibromoethane	11	U	230	11	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Dichlorodifluoromethane	18	U	91	18	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
cis-1,2-Dichloroethene	7.8	U	45	7.8	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
trans-1,2-Dichloroethene	10	U	45	10	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Isopropylbenzene	7.4	U	230	7.4	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Methyl acetate	28	U	1100	28	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Methyl tert-butyl ether	8.0	U	230	8.0	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,1,2-Trichloro-1,2,2-trifluoroethane	44	U	230	44	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,2,4-Trichlorobenzene	8.3	U	230	8.3	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,2-Dichlorobenzene	9.7	U	91	9.7	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,3-Dichlorobenzene	5.4	U	91	5.4	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
1,4-Dichlorobenzene	9.1	U	91	9.1	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Trichlorofluoromethane	18	U	91	18	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Dibromochloromethane	14	U	45	14	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1
Methylcyclohexane	14	U	1100	14	ug/Kg	☼	02/27/13 12:14	02/28/13 15:31	1

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: SB-3-13-5'
Date Collected: 02/24/13 10:00
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-3
Matrix: Solid
Percent Solids: 88.5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	79		39 - 128	02/27/13 12:14	02/28/13 15:31	1
4-Bromofluorobenzene (Surr)	73		26 - 141	02/27/13 12:14	02/28/13 15:31	1
Toluene-d8 (Surr)	83		33 - 134	02/27/13 12:14	02/28/13 15:31	1
Dibromofluoromethane (Surr)	78		30 - 122	02/27/13 12:14	02/28/13 15:31	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	3.7	U	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Benzo[a]pyrene	**9.9**	**J**	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Benzo[b]fluoranthene	**20**	**J**	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Benzo[g,h,i]perylene	**18**	**J**	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Benzo[k]fluoranthene	**6.9**	**J**	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Anthracene	3.7	U	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Chrysene	1.2	U	300	1.2	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Dibenz(a,h)anthracene	3.7	U	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Fluoranthene	**11**	**J**	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Fluorene	3.7	U	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Indeno[1,2,3-cd]pyrene	**12**	**J**	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Phenanthrene	3.7	U	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Pyrene	**9.5**	**J**	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Acenaphthene	3.7	U	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Acenaphthylene	3.7	U	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
Naphthalene	3.7	U	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1
2-Methylnaphthalene	3.7	U	300	3.7	ug/Kg	☼	02/28/13 09:45	03/04/13 19:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	67		24 - 110	02/28/13 09:45	03/04/13 19:47	1
2-Fluorophenol (Surr)	45		24 - 110	02/28/13 09:45	03/04/13 19:47	1
2,4,6-Tribromophenol (Surr)	30		10 - 110	02/28/13 09:45	03/04/13 19:47	1
Nitrobenzene-d5 (Surr)	66		20 - 110	02/28/13 09:45	03/04/13 19:47	1
Phenol-d5 (Surr)	44		26 - 110	02/28/13 09:45	03/04/13 19:47	1
Terphenyl-d14 (Surr)	92		36 - 110	02/28/13 09:45	03/04/13 19:47	1

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: SB-5-13-4.5-5'
Date Collected: 02/24/13 10:45
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-4
Matrix: Solid
Percent Solids: 85.9

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	200	U	700	200	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Benzene	14	U	47	14	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Bromodichloromethane	12	U	93	12	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Bromoform	22	U	93	22	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Bromomethane	34	U	230	34	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
2-Butanone (MEK)	50	U	700	50	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Carbon disulfide	14	U	230	14	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Carbon tetrachloride	7.4	U	47	7.4	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Chlorobenzene	7.4	U	47	7.4	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Chloroethane	71	U	230	71	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Chloroform	10	U	47	10	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Chloromethane	16	U	230	16	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,1-Dichloroethane	20	U	47	20	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,2-Dichloroethane	12	U	47	12	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,1-Dichloroethene	21	U	47	21	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,2-Dichloropropane	9.5	U	47	9.5	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
cis-1,3-Dichloropropene	9.2	U	47	9.2	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
trans-1,3-Dichloropropene	23	U	47	23	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Ethylbenzene	6.3	U	47	6.3	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
2-Hexanone	23	U	2300	23	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Methylene Chloride	90	U	230	90	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
4-Methyl-2-pentanone (MIBK)	56	U	2300	56	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Styrene	6.5	U	47	6.5	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,1,2,2-Tetrachloroethane	10	U	47	10	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Tetrachloroethene	14	U	47	14	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Toluene	20	U	93	20	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Trichloroethene	11	U	47	11	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Vinyl chloride	21	U	37	21	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Xylenes, Total	9.4	U	140	9.4	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,1,1-Trichloroethane	24	U	47	24	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,1,2-Trichloroethane	14	U	47	14	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Cyclohexane	47	U	1100	47	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,2-Dibromo-3-Chloropropane	58	U	230	58	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,2-Dibromoethane	12	U	230	12	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Dichlorodifluoromethane	19	U	93	19	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
cis-1,2-Dichloroethene	8.0	U	47	8.0	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
trans-1,2-Dichloroethene	11	U	47	11	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Isopropylbenzene	7.6	U	230	7.6	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Methyl acetate	29	U	1100	29	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Methyl tert-butyl ether	8.3	U	230	8.3	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,1,2-Trichloro-1,2,2-trifluoroethane	45	U	230	45	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,2,4-Trichlorobenzene	8.5	U	230	8.5	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,2-Dichlorobenzene	10	U	93	10	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,3-Dichlorobenzene	5.6	U	93	5.6	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
1,4-Dichlorobenzene	9.3	U	93	9.3	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Trichlorofluoromethane	19	U	93	19	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Dibromochloromethane	14	U	47	14	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1
Methylcyclohexane	14	U	1100	14	ug/Kg	☼	02/27/13 12:14	02/28/13 15:57	1

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: SB-5-13-4.5-5'
Date Collected: 02/24/13 10:45
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-4
Matrix: Solid
Percent Solids: 85.9

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	73		39 - 128	02/27/13 12:14	02/28/13 15:57	1
4-Bromofluorobenzene (Surr)	67		26 - 141	02/27/13 12:14	02/28/13 15:57	1
Toluene-d8 (Surr)	73		33 - 134	02/27/13 12:14	02/28/13 15:57	1
Dibromofluoromethane (Surr)	74		30 - 122	02/27/13 12:14	02/28/13 15:57	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	**61**	**J**	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Benzo[a]pyrene	**89**	**J**	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Benzo[b]fluoranthene	**120**	**J**	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Benzo[g,h,i]perylene	**58**	**J**	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Benzo[k]fluoranthene	**69**	**J**	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Anthracene	**15**	**J**	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Chrysene	**94**	**J**	760	3.2	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Dibenz(a,h)anthracene	9.5	U	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Fluoranthene	**95**	**J**	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Fluorene	9.5	U	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Indeno[1,2,3-cd]pyrene	9.5	U	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Phenanthrene	**42**	**J**	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Pyrene	**95**	**J**	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Acenaphthene	9.5	U	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Acenaphthylene	9.5	U	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
Naphthalene	9.5	U	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5
2-Methylnaphthalene	**12**	**J**	760	9.5	ug/Kg	☼	02/28/13 09:45	03/05/13 21:59	2.5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	78		24 - 110	02/28/13 09:45	03/05/13 21:59	2.5
2-Fluorophenol (Surr)	63		24 - 110	02/28/13 09:45	03/05/13 21:59	2.5
2,4,6-Tribromophenol (Surr)	60		10 - 110	02/28/13 09:45	03/05/13 21:59	2.5
Nitrobenzene-d5 (Surr)	67		20 - 110	02/28/13 09:45	03/05/13 21:59	2.5
Phenol-d5 (Surr)	67		26 - 110	02/28/13 09:45	03/05/13 21:59	2.5
Terphenyl-d14 (Surr)	97		36 - 110	02/28/13 09:45	03/05/13 21:59	2.5

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: TW-2-13-6'
Date Collected: 02/24/13 12:30
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-5
Matrix: Solid
Percent Solids: 94.5

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	180	U	630	180	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Benzene	13	U	42	13	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Bromodichloromethane	10	U	85	10	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Bromoform	20	U	85	20	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Bromomethane	31	U	210	31	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
2-Butanone (MEK)	45	U	630	45	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Carbon disulfide	13	U	210	13	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Carbon tetrachloride	6.8	U	42	6.8	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Chlorobenzene	6.8	U	42	6.8	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Chloroethane	65	U	210	65	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Chloroform	9.3	U	42	9.3	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Chloromethane	15	U	210	15	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,1-Dichloroethane	18	U	42	18	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,2-Dichloroethane	11	U	42	11	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,1-Dichloroethene	19	U	42	19	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,2-Dichloropropane	8.7	U	42	8.7	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
cis-1,3-Dichloropropene	8.4	U	42	8.4	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
trans-1,3-Dichloropropene	21	U	42	21	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Ethylbenzene	5.7	U	42	5.7	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
2-Hexanone	21	U	2100	21	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Methylene Chloride	81	U	210	81	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
4-Methyl-2-pentanone (MIBK)	51	U	2100	51	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Styrene	5.9	U	42	5.9	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,1,2,2-Tetrachloroethane	9.4	U	42	9.4	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Tetrachloroethene	**68**		42	13	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Toluene	18	U	85	18	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Trichloroethene	**190**		42	10	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Vinyl chloride	19	U	34	19	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Xylenes, Total	8.6	U	130	8.6	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,1,1-Trichloroethane	22	U	42	22	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,1,2-Trichloroethane	13	U	42	13	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Cyclohexane	42	U	1000	42	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,2-Dibromo-3-Chloropropane	53	U	210	53	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,2-Dibromoethane	11	U	210	11	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Dichlorodifluoromethane	17	U	85	17	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
cis-1,2-Dichloroethene	7.3	U	42	7.3	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
trans-1,2-Dichloroethene	9.7	U	42	9.7	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Isopropylbenzene	6.9	U	210	6.9	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Methyl acetate	26	U	1000	26	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Methyl tert-butyl ether	7.5	U	210	7.5	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,1,2-Trichloro-1,2,2-trifluoroethane	41	U	210	41	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,2,4-Trichlorobenzene	7.7	U	210	7.7	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,2-Dichlorobenzene	9.1	U	85	9.1	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,3-Dichlorobenzene	5.1	U	85	5.1	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
1,4-Dichlorobenzene	8.5	U	85	8.5	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Trichlorofluoromethane	17	U	85	17	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Dibromochloromethane	13	U	42	13	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1
Methylcyclohexane	13	U	1000	13	ug/Kg	☼	02/27/13 12:14	02/28/13 16:24	1

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: TW-2-13-6'
Date Collected: 02/24/13 12:30
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-5
Matrix: Solid
Percent Solids: 94.5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	76		39 - 128	02/27/13 12:14	02/28/13 16:24	1
4-Bromofluorobenzene (Surr)	67		26 - 141	02/27/13 12:14	02/28/13 16:24	1
Toluene-d8 (Surr)	77		33 - 134	02/27/13 12:14	02/28/13 16:24	1
Dibromofluoromethane (Surr)	77		30 - 122	02/27/13 12:14	02/28/13 16:24	1

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: TW-1-13
Date Collected: 02/24/13 13:05
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	5.5	U	50	5.5	ug/L			03/04/13 16:28	5
Benzene	0.65	U	5.0	0.65	ug/L			03/04/13 16:28	5
Bromodichloromethane	0.75	U	5.0	0.75	ug/L			03/04/13 16:28	5
Bromoform	3.2	U	5.0	3.2	ug/L			03/04/13 16:28	5
Bromomethane	2.1	U	5.0	2.1	ug/L			03/04/13 16:28	5
2-Butanone (MEK)	2.9	U	50	2.9	ug/L			03/04/13 16:28	5
Carbon disulfide	0.65	U	25	0.65	ug/L			03/04/13 16:28	5
Carbon tetrachloride	**0.98**	**J**	5.0	0.65	ug/L			03/04/13 16:28	5
Chlorobenzene	0.75	U	5.0	0.75	ug/L			03/04/13 16:28	5
Chloroethane	1.5	U	5.0	1.5	ug/L			03/04/13 16:28	5
Chloroform	**3.1**	**J**	5.0	0.80	ug/L			03/04/13 16:28	5
Chloromethane	1.5	U	5.0	1.5	ug/L			03/04/13 16:28	5
1,1-Dichloroethane	0.75	U	5.0	0.75	ug/L			03/04/13 16:28	5
1,2-Dichloroethane	1.1	U	5.0	1.1	ug/L			03/04/13 16:28	5
1,1-Dichloroethene	0.95	U	5.0	0.95	ug/L			03/04/13 16:28	5
1,2-Dichloropropane	0.90	U	5.0	0.90	ug/L			03/04/13 16:28	5
cis-1,3-Dichloropropene	0.70	U	5.0	0.70	ug/L			03/04/13 16:28	5
trans-1,3-Dichloropropene	0.95	U	5.0	0.95	ug/L			03/04/13 16:28	5
Ethylbenzene	0.85	U	5.0	0.85	ug/L			03/04/13 16:28	5
2-Hexanone	2.1	U	50	2.1	ug/L			03/04/13 16:28	5
Methylene Chloride	1.7	U	25	1.7	ug/L			03/04/13 16:28	5
4-Methyl-2-pentanone (MIBK)	1.6	U	50	1.6	ug/L			03/04/13 16:28	5
Styrene	0.55	U	5.0	0.55	ug/L			03/04/13 16:28	5
1,1,2,2-Tetrachloroethane	0.90	U	5.0	0.90	ug/L			03/04/13 16:28	5
Tetrachloroethene	1.5	U	5.0	1.5	ug/L			03/04/13 16:28	5
Toluene	0.65	U	5.0	0.65	ug/L			03/04/13 16:28	5
Trichloroethene	**120**		5.0	0.85	ug/L			03/04/13 16:28	5
Vinyl chloride	1.1	U	5.0	1.1	ug/L			03/04/13 16:28	5
Xylenes, Total	1.4	U	10	1.4	ug/L			03/04/13 16:28	5
1,1,1-Trichloroethane	**15**		5.0	1.1	ug/L			03/04/13 16:28	5
1,1,2-Trichloroethane	1.4	U	5.0	1.4	ug/L			03/04/13 16:28	5
Cyclohexane	0.60	U	5.0	0.60	ug/L			03/04/13 16:28	5
1,2-Dibromo-3-Chloropropane	3.4	U	5.0	3.4	ug/L			03/04/13 16:28	5
1,2-Dibromoethane	1.2	U	5.0	1.2	ug/L			03/04/13 16:28	5
Dichlorodifluoromethane	1.6	U	5.0	1.6	ug/L			03/04/13 16:28	5
cis-1,2-Dichloroethene	0.85	U	5.0	0.85	ug/L			03/04/13 16:28	5
trans-1,2-Dichloroethene	0.95	U	5.0	0.95	ug/L			03/04/13 16:28	5
Isopropylbenzene	0.65	U	5.0	0.65	ug/L			03/04/13 16:28	5
Methyl acetate	1.9	U	50	1.9	ug/L			03/04/13 16:28	5
Methyl tert-butyl ether	0.85	U	25	0.85	ug/L			03/04/13 16:28	5
1,1,2-Trichloro-1,2,2-trifluoroethane	1.4	U	5.0	1.4	ug/L			03/04/13 16:28	5
1,2,4-Trichlorobenzene	0.75	U	5.0	0.75	ug/L			03/04/13 16:28	5
1,2-Dichlorobenzene	0.65	U	5.0	0.65	ug/L			03/04/13 16:28	5
1,3-Dichlorobenzene	0.70	U	5.0	0.70	ug/L			03/04/13 16:28	5
1,4-Dichlorobenzene	0.65	U	5.0	0.65	ug/L			03/04/13 16:28	5
Trichlorofluoromethane	1.1	U	5.0	1.1	ug/L			03/04/13 16:28	5
Dibromochloromethane	0.90	U	5.0	0.90	ug/L			03/04/13 16:28	5
Methylcyclohexane	0.65	U	5.0	0.65	ug/L			03/04/13 16:28	5

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: TW-1-13
Date Collected: 02/24/13 13:05
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-6
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		63 - 129		03/04/13 16:28	5
4-Bromofluorobenzene (Surr)	76		66 - 117		03/04/13 16:28	5
Toluene-d8 (Surr)	89		74 - 115		03/04/13 16:28	5
Dibromofluoromethane (Surr)	93		75 - 121		03/04/13 16:28	5

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: TW-2-13
Date Collected: 02/24/13 15:35
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	5.5	U	50	5.5	ug/L			03/04/13 16:50	5
Benzene	0.65	U	5.0	0.65	ug/L			03/04/13 16:50	5
Bromodichloromethane	0.75	U	5.0	0.75	ug/L			03/04/13 16:50	5
Bromoform	3.2	U	5.0	3.2	ug/L			03/04/13 16:50	5
Bromomethane	2.1	U	5.0	2.1	ug/L			03/04/13 16:50	5
2-Butanone (MEK)	2.9	U	50	2.9	ug/L			03/04/13 16:50	5
Carbon disulfide	0.65	U	25	0.65	ug/L			03/04/13 16:50	5
Carbon tetrachloride	**0.83**	**J**	5.0	0.65	ug/L			03/04/13 16:50	5
Chlorobenzene	0.75	U	5.0	0.75	ug/L			03/04/13 16:50	5
Chloroethane	1.5	U	5.0	1.5	ug/L			03/04/13 16:50	5
Chloroform	**2.3**	**J**	5.0	0.80	ug/L			03/04/13 16:50	5
Chloromethane	1.5	U	5.0	1.5	ug/L			03/04/13 16:50	5
1,1-Dichloroethane	0.75	U	5.0	0.75	ug/L			03/04/13 16:50	5
1,2-Dichloroethane	1.1	U	5.0	1.1	ug/L			03/04/13 16:50	5
1,1-Dichloroethene	0.95	U	5.0	0.95	ug/L			03/04/13 16:50	5
1,2-Dichloropropane	0.90	U	5.0	0.90	ug/L			03/04/13 16:50	5
cis-1,3-Dichloropropene	0.70	U	5.0	0.70	ug/L			03/04/13 16:50	5
trans-1,3-Dichloropropene	0.95	U	5.0	0.95	ug/L			03/04/13 16:50	5
Ethylbenzene	0.85	U	5.0	0.85	ug/L			03/04/13 16:50	5
2-Hexanone	2.1	U	50	2.1	ug/L			03/04/13 16:50	5
Methylene Chloride	1.7	U	25	1.7	ug/L			03/04/13 16:50	5
4-Methyl-2-pentanone (MIBK)	1.6	U	50	1.6	ug/L			03/04/13 16:50	5
Styrene	0.55	U	5.0	0.55	ug/L			03/04/13 16:50	5
1,1,2,2-Tetrachloroethane	0.90	U	5.0	0.90	ug/L			03/04/13 16:50	5
Tetrachloroethene	1.5	U	5.0	1.5	ug/L			03/04/13 16:50	5
Toluene	0.65	U	5.0	0.65	ug/L			03/04/13 16:50	5
Trichloroethene	**130**		5.0	0.85	ug/L			03/04/13 16:50	5
Vinyl chloride	1.1	U	5.0	1.1	ug/L			03/04/13 16:50	5
Xylenes, Total	1.4	U	10	1.4	ug/L			03/04/13 16:50	5
1,1,1-Trichloroethane	**15**		5.0	1.1	ug/L			03/04/13 16:50	5
1,1,2-Trichloroethane	1.4	U	5.0	1.4	ug/L			03/04/13 16:50	5
Cyclohexane	0.60	U	5.0	0.60	ug/L			03/04/13 16:50	5
1,2-Dibromo-3-Chloropropane	3.4	U	5.0	3.4	ug/L			03/04/13 16:50	5
1,2-Dibromoethane	1.2	U	5.0	1.2	ug/L			03/04/13 16:50	5
Dichlorodifluoromethane	1.6	U	5.0	1.6	ug/L			03/04/13 16:50	5
cis-1,2-Dichloroethene	0.85	U	5.0	0.85	ug/L			03/04/13 16:50	5
trans-1,2-Dichloroethene	0.95	U	5.0	0.95	ug/L			03/04/13 16:50	5
Isopropylbenzene	0.65	U	5.0	0.65	ug/L			03/04/13 16:50	5
Methyl acetate	1.9	U	50	1.9	ug/L			03/04/13 16:50	5
Methyl tert-butyl ether	0.85	U	25	0.85	ug/L			03/04/13 16:50	5
1,1,2-Trichloro-1,2,2-trifluoroethane	1.4	U	5.0	1.4	ug/L			03/04/13 16:50	5
1,2,4-Trichlorobenzene	0.75	U	5.0	0.75	ug/L			03/04/13 16:50	5
1,2-Dichlorobenzene	0.65	U	5.0	0.65	ug/L			03/04/13 16:50	5
1,3-Dichlorobenzene	0.70	U	5.0	0.70	ug/L			03/04/13 16:50	5
1,4-Dichlorobenzene	0.65	U	5.0	0.65	ug/L			03/04/13 16:50	5
Trichlorofluoromethane	1.1	U	5.0	1.1	ug/L			03/04/13 16:50	5
Dibromochloromethane	0.90	U	5.0	0.90	ug/L			03/04/13 16:50	5
Methylcyclohexane	0.65	U	5.0	0.65	ug/L			03/04/13 16:50	5

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: TW-2-13
Date Collected: 02/24/13 15:35
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-7
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		63 - 129		03/04/13 16:50	5
4-Bromofluorobenzene (Surr)	74		66 - 117		03/04/13 16:50	5
Toluene-d8 (Surr)	89		74 - 115		03/04/13 16:50	5
Dibromofluoromethane (Surr)	90		75 - 121		03/04/13 16:50	5

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: MW-6R-13(10')
Date Collected: 02/24/13 09:40
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-8
Matrix: Solid
Percent Solids: 86.3

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	6600	U	23000	6600	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Benzene	460	U	1500	460	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Bromodichloromethane	380	U	3100	380	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Bromoform	740	U	3100	740	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Bromomethane	1100	U	7700	1100	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
2-Butanone (MEK)	1700	U	23000	1700	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Carbon disulfide	460	U	7700	460	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Carbon tetrachloride	250	U	1500	250	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Chlorobenzene	250	U	1500	250	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Chloroethane	2400	U	7700	2400	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Chloroform	340	U	1500	340	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Chloromethane	540	U	7700	540	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,1-Dichloroethane	660	U	1500	660	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,2-Dichloroethane	390	U	1500	390	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,1-Dichloroethene	700	U	1500	700	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,2-Dichloropropane	320	U	1500	320	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
cis-1,3-Dichloropropene	310	U	1500	310	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
trans-1,3-Dichloropropene	770	U	1500	770	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Ethylbenzene	**2200**		1500	210	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
2-Hexanone	770	U	77000	770	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Methylene Chloride	3000	U	7700	3000	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
4-Methyl-2-pentanone (MIBK)	1900	U	77000	1900	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Styrene	220	U	1500	220	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,1,2,2-Tetrachloroethane	340	U	1500	340	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Tetrachloroethene	460	U	1500	460	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Toluene	660	U	3100	660	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Trichloroethene	380	U	1500	380	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Vinyl chloride	700	U	1200	700	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Xylenes, Total	**8800**		4600	310	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,1,1-Trichloroethane	810	U	1500	810	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,1,2-Trichloroethane	460	U	1500	460	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Cyclohexane	**7200**	**J**	37000	1500	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,2-Dibromo-3-Chloropropane	1900	U	7700	1900	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,2-Dibromoethane	390	U	7700	390	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Dichlorodifluoromethane	620	U	3100	620	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
cis-1,2-Dichloroethene	270	U	1500	270	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
trans-1,2-Dichloroethene	360	U	1500	360	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Isopropylbenzene	**1800**	**J**	7700	250	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Methyl acetate	970	U	37000	970	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Methyl tert-butyl ether	270	U	7700	270	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,1,2-Trichloro-1,2,2-trifluoroethane	1500	U	7700	1500	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,2,4-Trichlorobenzene	280	U	7700	280	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,2-Dichlorobenzene	330	U	3100	330	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,3-Dichlorobenzene	190	U	3100	190	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
1,4-Dichlorobenzene	310	U	3100	310	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Trichlorofluoromethane	620	U	3100	620	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Dibromochloromethane	460	U	1500	460	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333
Methylcyclohexane	**44000**	**B**	37000	460	ug/Kg	☼	02/27/13 12:14	03/01/13 13:23	33.333

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: MW-6R-13(10')
Date Collected: 02/24/13 09:40
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-8
Matrix: Solid
Percent Solids: 86.3

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	1	X	39 - 128	02/27/13 12:14	03/01/13 13:23	33.333
4-Bromofluorobenzene (Surr)	4	X	26 - 141	02/27/13 12:14	03/01/13 13:23	33.333
Toluene-d8 (Surr)	2	X	33 - 134	02/27/13 12:14	03/01/13 13:23	33.333
Dibromofluoromethane (Surr)	0	X	30 - 122	02/27/13 12:14	03/01/13 13:23	33.333

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	22	J	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Benzo[a]pyrene	20	J	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Benzo[b]fluoranthene	20	J	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Benzo[g,h,i]perylene	11	J	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Benzo[k]fluoranthene	7.7	J	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Anthracene	14	J	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Chrysene	18	J	300	1.3	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Dibenz(a,h)anthracene	3.8	U	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Fluoranthene	48	J	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Fluorene	18	J	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Indeno[1,2,3-cd]pyrene	6.3	J	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Phenanthrene	51	J	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Pyrene	44	J	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Acenaphthene	27	J	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Acenaphthylene	3.8	U	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
Naphthalene	1600		300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1
2-Methylnaphthalene	3500	E	300	3.8	ug/Kg	☼	02/28/13 09:45	03/04/13 19:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	64		24 - 110	02/28/13 09:45	03/04/13 19:00	1
2-Fluorophenol (Surr)	66		24 - 110	02/28/13 09:45	03/04/13 19:00	1
2,4,6-Tribromophenol (Surr)	57		10 - 110	02/28/13 09:45	03/04/13 19:00	1
Nitrobenzene-d5 (Surr)	121	X	20 - 110	02/28/13 09:45	03/04/13 19:00	1
Phenol-d5 (Surr)	64		26 - 110	02/28/13 09:45	03/04/13 19:00	1
Terphenyl-d14 (Surr)	91		36 - 110	02/28/13 09:45	03/04/13 19:00	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	27	J	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Benzo[a]pyrene	16	J	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Benzo[b]fluoranthene	16	J	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Benzo[g,h,i]perylene	15	U	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Benzo[k]fluoranthene	15	U	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Anthracene	16	J	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Chrysene	21	J	1200	5.0	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Dibenz(a,h)anthracene	15	U	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Fluoranthene	48	J	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Fluorene	22	J	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Indeno[1,2,3-cd]pyrene	15	U	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Phenanthrene	48	J	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Pyrene	41	J	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Acenaphthene	32	J	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Acenaphthylene	15	U	1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4
Naphthalene	1700		1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: MW-6R-13(10')
Date Collected: 02/24/13 09:40
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-8
Matrix: Solid
Percent Solids: 86.3

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - RA (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	3600		1200	15	ug/Kg	☼	02/28/13 09:45	03/05/13 21:12	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*65*		*24 - 110*	*02/28/13 09:45*	*03/05/13 21:12*	*4*
2-Fluorophenol (Surr)	*58*		*24 - 110*	*02/28/13 09:45*	*03/05/13 21:12*	*4*
2,4,6-Tribromophenol (Surr)	*59*		*10 - 110*	*02/28/13 09:45*	*03/05/13 21:12*	*4*
Nitrobenzene-d5 (Surr)	*131*	*X*	*20 - 110*	*02/28/13 09:45*	*03/05/13 21:12*	*4*
Phenol-d5 (Surr)	*58*		*26 - 110*	*02/28/13 09:45*	*03/05/13 21:12*	*4*
Terphenyl-d14 (Surr)	*83*		*36 - 110*	*02/28/13 09:45*	*03/05/13 21:12*	*4*

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: MW-6R-13(11')
Date Collected: 02/24/13 11:30
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-9
Matrix: Solid
Percent Solids: 83.0

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1300	U	4600	1300	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Benzene	**280**	**J**	300	91	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Bromodichloromethane	75	U	610	75	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Bromoform	140	U	610	140	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Bromomethane	220	U	1500	220	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
2-Butanone (MEK)	330	U	4600	330	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Carbon disulfide	91	U	1500	91	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Carbon tetrachloride	49	U	300	49	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Chlorobenzene	49	U	300	49	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Chloroethane	460	U	1500	460	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Chloroform	67	U	300	67	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Chloromethane	110	U	1500	110	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,1-Dichloroethane	130	U	300	130	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,2-Dichloroethane	76	U	300	76	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,1-Dichloroethene	140	U	300	140	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,2-Dichloropropane	62	U	300	62	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
cis-1,3-Dichloropropene	60	U	300	60	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
trans-1,3-Dichloropropene	150	U	300	150	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Ethylbenzene	**4600**		300	41	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
2-Hexanone	150	U	15000	150	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Methylene Chloride	580	U	1500	580	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
4-Methyl-2-pentanone (MIBK)	360	U	15000	360	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Styrene	42	U	300	42	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,1,2,2-Tetrachloroethane	68	U	300	68	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Tetrachloroethene	91	U	300	91	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Toluene	**580**	**J**	610	130	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Trichloroethene	74	U	300	74	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Vinyl chloride	140	U	240	140	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Xylenes, Total	**43000**		910	61	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,1,1-Trichloroethane	160	U	300	160	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,1,2-Trichloroethane	91	U	300	91	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Cyclohexane	**1700**	**J**	7300	300	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,2-Dibromo-3-Chloropropane	380	U	1500	380	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,2-Dibromoethane	76	U	1500	76	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Dichlorodifluoromethane	120	U	610	120	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
cis-1,2-Dichloroethene	52	U	300	52	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
trans-1,2-Dichloroethene	70	U	300	70	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Isopropylbenzene	**1500**		1500	49	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Methyl acetate	**410**	**J**	7300	190	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Methyl tert-butyl ether	54	U	1500	54	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,1,2-Trichloro-1,2,2-trifluoroethane	300	U	1500	300	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,2,4-Trichlorobenzene	55	U	1500	55	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,2-Dichlorobenzene	65	U	610	65	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,3-Dichlorobenzene	36	U	610	36	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
1,4-Dichlorobenzene	61	U	610	61	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Trichlorofluoromethane	120	U	610	120	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Dibromochloromethane	91	U	300	91	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667
Methylcyclohexane	**16000**	**B**	7300	91	ug/Kg	☼	02/27/13 12:14	02/28/13 17:43	6.667

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: MW-6R-13(11')
Date Collected: 02/24/13 11:30
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-9
Matrix: Solid
Percent Solids: 83.0

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		39 - 128	02/27/13 12:14	02/28/13 17:43	6.667
4-Bromofluorobenzene (Surr)	98		26 - 141	02/27/13 12:14	02/28/13 17:43	6.667
Toluene-d8 (Surr)	96		33 - 134	02/27/13 12:14	02/28/13 17:43	6.667
Dibromofluoromethane (Surr)	73		30 - 122	02/27/13 12:14	02/28/13 17:43	6.667

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: MW-13-13(8')
Date Collected: 02/24/13 15:00
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-10
Matrix: Solid
Percent Solids: 48.2

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	320	U	1100	320	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Benzene	23	U	76	23	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Bromodichloromethane	19	U	150	19	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Bromoform	36	U	150	36	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Bromomethane	55	U	380	55	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
2-Butanone (MEK)	82	U	1100	82	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Carbon disulfide	23	U	380	23	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Carbon tetrachloride	12	U	76	12	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Chlorobenzene	12	U	76	12	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Chloroethane	120	U	380	120	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Chloroform	17	U	76	17	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Chloromethane	27	U	380	27	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,1-Dichloroethane	32	U	76	32	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,2-Dichloroethane	19	U	76	19	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,1-Dichloroethene	34	U	76	34	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,2-Dichloropropane	16	U	76	16	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
cis-1,3-Dichloropropene	15	U	76	15	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
trans-1,3-Dichloropropene	38	U	76	38	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Ethylbenzene	10	U	76	10	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
2-Hexanone	38	U	3800	38	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Methylene Chloride	150	U	380	150	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
4-Methyl-2-pentanone (MIBK)	91	U	3800	91	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Styrene	11	U	76	11	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,1,2,2-Tetrachloroethane	17	U	76	17	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Tetrachloroethene	23	U	76	23	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Toluene	32	U	150	32	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Trichloroethene	**40**	**J**	76	18	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Vinyl chloride	34	U	61	34	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Xylenes, Total	15	U	230	15	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,1,1-Trichloroethane	40	U	76	40	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,1,2-Trichloroethane	23	U	76	23	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Cyclohexane	76	U	1800	76	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,2-Dibromo-3-Chloropropane	95	U	380	95	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,2-Dibromoethane	19	U	380	19	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Dichlorodifluoromethane	30	U	150	30	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
cis-1,2-Dichloroethene	13	U	76	13	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
trans-1,2-Dichloroethene	18	U	76	18	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Isopropylbenzene	12	U	380	12	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Methyl acetate	48	U	1800	48	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Methyl tert-butyl ether	14	U	380	14	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,1,2-Trichloro-1,2,2-trifluoroethane	74	U	380	74	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,2,4-Trichlorobenzene	14	U	380	14	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,2-Dichlorobenzene	16	U	150	16	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,3-Dichlorobenzene	9.1	U	150	9.1	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
1,4-Dichlorobenzene	15	U	150	15	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Trichlorofluoromethane	30	U	150	30	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Dibromochloromethane	23	U	76	23	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1
Methylcyclohexane	23	U	1800	23	ug/Kg	☼	02/27/13 12:14	03/01/13 11:45	1

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: MW-13-13(8')
Date Collected: 02/24/13 15:00
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-10
Matrix: Solid
Percent Solids: 48.2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		39 - 128	02/27/13 12:14	03/01/13 11:45	1
4-Bromofluorobenzene (Surr)	88		26 - 141	02/27/13 12:14	03/01/13 11:45	1
Toluene-d8 (Surr)	90		33 - 134	02/27/13 12:14	03/01/13 11:45	1
Dibromofluoromethane (Surr)	76		30 - 122	02/27/13 12:14	03/01/13 11:45	1

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: TRIP BLANK
Date Collected: 02/24/13 00:00
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-11
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.9	J	10	1.1	ug/L			03/04/13 17:11	1
Benzene	0.13	U	1.0	0.13	ug/L			03/04/13 17:11	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			03/04/13 17:11	1
Bromoform	0.64	U	1.0	0.64	ug/L			03/04/13 17:11	1
Bromomethane	0.41	U	1.0	0.41	ug/L			03/04/13 17:11	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			03/04/13 17:11	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			03/04/13 17:11	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			03/04/13 17:11	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			03/04/13 17:11	1
Chloroethane	0.29	U	1.0	0.29	ug/L			03/04/13 17:11	1
Chloroform	0.16	U	1.0	0.16	ug/L			03/04/13 17:11	1
Chloromethane	0.30	U	1.0	0.30	ug/L			03/04/13 17:11	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			03/04/13 17:11	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			03/04/13 17:11	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			03/04/13 17:11	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			03/04/13 17:11	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			03/04/13 17:11	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			03/04/13 17:11	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			03/04/13 17:11	1
2-Hexanone	0.41	U	10	0.41	ug/L			03/04/13 17:11	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			03/04/13 17:11	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			03/04/13 17:11	1
Styrene	0.11	U	1.0	0.11	ug/L			03/04/13 17:11	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			03/04/13 17:11	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			03/04/13 17:11	1
Toluene	0.13	U	1.0	0.13	ug/L			03/04/13 17:11	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			03/04/13 17:11	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			03/04/13 17:11	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			03/04/13 17:11	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			03/04/13 17:11	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			03/04/13 17:11	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			03/04/13 17:11	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			03/04/13 17:11	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			03/04/13 17:11	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			03/04/13 17:11	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			03/04/13 17:11	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			03/04/13 17:11	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			03/04/13 17:11	1
Methyl acetate	0.38	U	10	0.38	ug/L			03/04/13 17:11	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			03/04/13 17:11	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			03/04/13 17:11	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			03/04/13 17:11	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			03/04/13 17:11	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			03/04/13 17:11	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			03/04/13 17:11	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			03/04/13 17:11	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			03/04/13 17:11	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			03/04/13 17:11	1

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: TRIP BLANK
Date Collected: 02/24/13 00:00
Date Received: 02/26/13 09:15

Lab Sample ID: 240-21427-11
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		63 - 129		03/04/13 17:11	1
4-Bromofluorobenzene (Surr)	79		66 - 117		03/04/13 17:11	1
Toluene-d8 (Surr)	87		74 - 115		03/04/13 17:11	1
Dibromofluoromethane (Surr)	91		75 - 121		03/04/13 17:11	1

Surrogate Summary

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(39-128)	(26-141)	(33-134)	(30-122)
240-21427-1	SB-1-13-2.5'	75	69	76	76
240-21427-2	SB-1-13-5'	73	67	77	76
240-21427-3	SB-3-13-5'	79	73	83	78
240-21427-4	SB-5-13-4.5-5'	73	67	73	74
240-21427-5	TW-2-13-6'	76	67	77	77
240-21427-8	MW-6R-13(10')	1 X	4 X	2 X	0 X
240-21427-9	MW-6R-13(11')	80	98	96	73
240-21427-10	MW-13-13(8')	82	88	90	76
LCS 240-76655/2-A	Lab Control Sample	82	71	80	84
MB 240-76655/1-A	Method Blank	76	68	79	78

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(63-129)	(66-117)	(74-115)	(75-121)
240-21427-6	TW-1-13	81	76	89	93
240-21427-7	TW-2-13	81	74	89	90
240-21427-11	TRIP BLANK	80	79	87	91
LCS 240-77112/4	Lab Control Sample	80	96	93	88
MB 240-77112/5	Method Blank	77	83	89	93

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		FBP	2FP	TBP	NBZ	PHL	TPH
Lab Sample ID	Client Sample ID	(24-110)	(24-110)	(10-110)	(20-110)	(26-110)	(36-110)
240-21427-1	SB-1-13-2.5'	69	50	42	63	53	87
240-21427-2	SB-1-13-5'	64	57	44	63	56	82
240-21427-3	SB-3-13-5'	67	45	30	66	44	92
240-21427-4	SB-5-13-4.5-5'	78	63	60	67	67	97
240-21427-8	MW-6R-13(10')	64	66	57	121 X	64	91
240-21427-8 - RA	MW-6R-13(10')	65	58	59	131 X	58	83
LCS 240-76773/18-A	Lab Control Sample	64	53	53	61	53	82
MB 240-76773/17-A	Method Blank	71	57	39	69	57	100

Surrogate Summary

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-76655/1-A
Matrix: Solid
Analysis Batch: 76797

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 76655

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	170	U	600	170	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Benzene	12	U	40	12	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Bromodichloromethane	9.9	U	80	9.9	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Bromoform	19	U	80	19	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Bromomethane	29	U	200	29	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
2-Butanone (MEK)	43	U	600	43	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Carbon disulfide	12	U	200	12	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Carbon tetrachloride	6.4	U	40	6.4	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Chlorobenzene	6.4	U	40	6.4	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Chloroethane	61	U	200	61	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Chloroform	8.8	U	40	8.8	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Chloromethane	14	U	200	14	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,1-Dichloroethane	17	U	40	17	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,2-Dichloroethane	10	U	40	10	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,1-Dichloroethene	18	U	40	18	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,2-Dichloropropane	8.2	U	40	8.2	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
cis-1,3-Dichloropropene	7.9	U	40	7.9	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
trans-1,3-Dichloropropene	20	U	40	20	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Ethylbenzene	5.4	U	40	5.4	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
2-Hexanone	20	U	2000	20	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Methylene Chloride	77	U	200	77	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
4-Methyl-2-pentanone (MIBK)	48	U	2000	48	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Styrene	5.6	U	40	5.6	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,1,2,2-Tetrachloroethane	8.9	U	40	8.9	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Tetrachloroethene	12	U	40	12	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Toluene	17	U	80	17	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Trichloroethene	9.7	U	40	9.7	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Vinyl chloride	18	U	32	18	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Xylenes, Total	8.1	U	120	8.1	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,1,1-Trichloroethane	21	U	40	21	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,1,2-Trichloroethane	12	U	40	12	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Cyclohexane	40	U	960	40	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,2-Dibromo-3-Chloropropane	50	U	200	50	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,2-Dibromoethane	10	U	200	10	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Dichlorodifluoromethane	16	U	80	16	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
cis-1,2-Dichloroethene	6.9	U	40	6.9	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
trans-1,2-Dichloroethene	9.2	U	40	9.2	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Isopropylbenzene	6.5	U	200	6.5	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Methyl acetate	25	U	960	25	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Methyl tert-butyl ether	7.1	U	200	7.1	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,1,2-Trichloro-1,2,2-trifluoroethane	39	U	200	39	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,2,4-Trichlorobenzene	24.4	J	200	7.3	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,2-Dichlorobenzene	8.6	U	80	8.6	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,3-Dichlorobenzene	4.8	U	80	4.8	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
1,4-Dichlorobenzene	8.0	U	80	8.0	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Trichlorofluoromethane	16	U	80	16	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Dibromochloromethane	12	U	40	12	ug/Kg		02/27/13 12:14	02/28/13 14:12	1
Methylcyclohexane	13.7	J	960	12	ug/Kg		02/27/13 12:14	02/28/13 14:12	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-76655/1-A
Matrix: Solid
Analysis Batch: 76797

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 76655

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	76		39 - 128	02/27/13 12:14	02/28/13 14:12	1
4-Bromofluorobenzene (Surr)	68		26 - 141	02/27/13 12:14	02/28/13 14:12	1
Toluene-d8 (Surr)	79		33 - 134	02/27/13 12:14	02/28/13 14:12	1
Dibromofluoromethane (Surr)	78		30 - 122	02/27/13 12:14	02/28/13 14:12	1

Lab Sample ID: LCS 240-76655/2-A
Matrix: Solid
Analysis Batch: 76797

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 76655

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	1000	906		ug/Kg		91	16 - 156
Benzene	500	438		ug/Kg		88	70 - 117
Bromodichloromethane	500	413		ug/Kg		83	28 - 123
Bromoform	500	274		ug/Kg		55	10 - 117
Bromomethane	500	558		ug/Kg		112	10 - 114
2-Butanone (MEK)	1000	1020		ug/Kg		102	10 - 199
Carbon disulfide	500	466		ug/Kg		93	10 - 132
Carbon tetrachloride	500	399		ug/Kg		80	29 - 118
Chlorobenzene	500	437		ug/Kg		87	71 - 116
Chloroethane	500	471		ug/Kg		94	10 - 120
Chloroform	500	410		ug/Kg		82	63 - 116
Chloromethane	500	298		ug/Kg		60	25 - 110
1,1-Dichloroethane	500	450		ug/Kg		90	63 - 117
1,2-Dichloroethane	500	468		ug/Kg		94	68 - 119
1,1-Dichloroethene	500	513		ug/Kg		103	44 - 143
1,2-Dichloropropane	500	434		ug/Kg		87	73 - 113
cis-1,3-Dichloropropene	500	336		ug/Kg		67	25 - 120
trans-1,3-Dichloropropene	500	319		ug/Kg		64	22 - 122
Ethylbenzene	500	452		ug/Kg		90	66 - 119
2-Hexanone	1000	798	J	ug/Kg		80	43 - 130
Methylene Chloride	500	502		ug/Kg		100	27 - 172
4-Methyl-2-pentanone (MIBK)	1000	742	J	ug/Kg		74	49 - 121
Styrene	500	429		ug/Kg		86	60 - 120
1,1,2,2-Tetrachloroethane	500	372		ug/Kg		74	54 - 121
Tetrachloroethene	500	526		ug/Kg		105	58 - 131
Toluene	500	444		ug/Kg		89	66 - 123
Trichloroethene	500	507		ug/Kg		101	59 - 124
Vinyl chloride	500	333		ug/Kg		67	33 - 110
Xylenes, Total	1500	1320		ug/Kg		88	68 - 119
1,1,1-Trichloroethane	500	456		ug/Kg		91	38 - 122
1,1,2-Trichloroethane	500	431		ug/Kg		86	74 - 114
Cyclohexane	500	459	J	ug/Kg		92	40 - 120
1,2-Dibromo-3-Chloropropane	500	285		ug/Kg		57	10 - 129
1,2-Dibromoethane	500	429		ug/Kg		86	47 - 123
Dichlorodifluoromethane	500	192		ug/Kg		38	10 - 110
cis-1,2-Dichloroethene	500	403		ug/Kg		81	60 - 125
trans-1,2-Dichloroethene	500	474		ug/Kg		95	58 - 121
Isopropylbenzene	500	469		ug/Kg		94	61 - 123

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-76655/2-A
Matrix: Solid
Analysis Batch: 76797

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 76655

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methyl acetate	500	446	J	ug/Kg		89	44 - 173
Methyl tert-butyl ether	500	572		ug/Kg		114	34 - 157
1,1,2-Trichloro-1,2,2-trifluoroethane	500	533		ug/Kg		107	48 - 151
1,2,4-Trichlorobenzene	500	558		ug/Kg		112	41 - 135
1,2-Dichlorobenzene	500	460		ug/Kg		92	68 - 118
1,3-Dichlorobenzene	500	446		ug/Kg		89	66 - 121
1,4-Dichlorobenzene	500	443		ug/Kg		89	65 - 119
Trichlorofluoromethane	500	530		ug/Kg		106	17 - 145
Dibromochloromethane	500	348		ug/Kg		70	22 - 113
Methylcyclohexane	500	457	J	ug/Kg		91	41 - 133

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*39 - 128*
4-Bromofluorobenzene (Surr)	*71*		*26 - 141*
Toluene-d8 (Surr)	*80*		*33 - 134*
Dibromofluoromethane (Surr)	*84*		*30 - 122*

Lab Sample ID: MB 240-77112/5
Matrix: Water
Analysis Batch: 77112

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			03/04/13 14:19	1
Benzene	0.13	U	1.0	0.13	ug/L			03/04/13 14:19	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			03/04/13 14:19	1
Bromoform	0.64	U	1.0	0.64	ug/L			03/04/13 14:19	1
Bromomethane	0.41	U	1.0	0.41	ug/L			03/04/13 14:19	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			03/04/13 14:19	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			03/04/13 14:19	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			03/04/13 14:19	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			03/04/13 14:19	1
Chloroethane	0.29	U	1.0	0.29	ug/L			03/04/13 14:19	1
Chloroform	0.16	U	1.0	0.16	ug/L			03/04/13 14:19	1
Chloromethane	0.30	U	1.0	0.30	ug/L			03/04/13 14:19	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			03/04/13 14:19	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			03/04/13 14:19	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			03/04/13 14:19	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			03/04/13 14:19	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			03/04/13 14:19	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			03/04/13 14:19	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			03/04/13 14:19	1
2-Hexanone	0.41	U	10	0.41	ug/L			03/04/13 14:19	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			03/04/13 14:19	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			03/04/13 14:19	1
Styrene	0.11	U	1.0	0.11	ug/L			03/04/13 14:19	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			03/04/13 14:19	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			03/04/13 14:19	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-77112/5
Matrix: Water
Analysis Batch: 77112

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	0.13	U	1.0	0.13	ug/L			03/04/13 14:19	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			03/04/13 14:19	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			03/04/13 14:19	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			03/04/13 14:19	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			03/04/13 14:19	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			03/04/13 14:19	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			03/04/13 14:19	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			03/04/13 14:19	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			03/04/13 14:19	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			03/04/13 14:19	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			03/04/13 14:19	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			03/04/13 14:19	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			03/04/13 14:19	1
Methyl acetate	0.38	U	10	0.38	ug/L			03/04/13 14:19	1
Methyl tert-butyl ether	0.17	U	5.0	0.17	ug/L			03/04/13 14:19	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			03/04/13 14:19	1
1,2,4-Trichlorobenzene	0.402	J	1.0	0.15	ug/L			03/04/13 14:19	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			03/04/13 14:19	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			03/04/13 14:19	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			03/04/13 14:19	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			03/04/13 14:19	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			03/04/13 14:19	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			03/04/13 14:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*63 - 129*		*03/04/13 14:19*	*1*
4-Bromofluorobenzene (Surr)	*83*		*66 - 117*		*03/04/13 14:19*	*1*
Toluene-d8 (Surr)	*89*		*74 - 115*		*03/04/13 14:19*	*1*
Dibromofluoromethane (Surr)	*93*		*75 - 121*		*03/04/13 14:19*	*1*

Lab Sample ID: LCS 240-77112/4
Matrix: Water
Analysis Batch: 77112

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	16.3		ug/L		82	43 - 136
Benzene	10.0	9.95		ug/L		100	83 - 112
Bromodichloromethane	10.0	9.34		ug/L		93	72 - 121
Bromoform	10.0	9.63		ug/L		96	40 - 131
Bromomethane	10.0	7.19		ug/L		72	11 - 185
2-Butanone (MEK)	20.0	16.3		ug/L		82	60 - 126
Carbon disulfide	10.0	9.81		ug/L		98	62 - 142
Carbon tetrachloride	10.0	9.28		ug/L		93	66 - 128
Chlorobenzene	10.0	10.1		ug/L		101	85 - 110
Chloroethane	10.0	7.34		ug/L		73	25 - 153
Chloroform	10.0	9.20		ug/L		92	79 - 117
Chloromethane	10.0	8.13		ug/L		81	44 - 126
1,1-Dichloroethane	10.0	9.53		ug/L		95	82 - 115

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-77112/4
Matrix: Water
Analysis Batch: 77112

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dichloroethane	10.0	9.11		ug/L		91	71 - 127
1,1-Dichloroethene	10.0	11.4		ug/L		114	78 - 131
1,2-Dichloropropane	10.0	9.67		ug/L		97	81 - 115
cis-1,3-Dichloropropene	10.0	8.97		ug/L		90	61 - 115
trans-1,3-Dichloropropene	10.0	9.69		ug/L		97	58 - 117
Ethylbenzene	10.0	10.2		ug/L		102	83 - 112
2-Hexanone	20.0	17.3		ug/L		87	55 - 133
Methylene Chloride	10.0	9.52		ug/L		95	66 - 131
4-Methyl-2-pentanone (MIBK)	20.0	17.2		ug/L		86	63 - 128
Styrene	10.0	9.91		ug/L		99	79 - 114
1,1,2,2-Tetrachloroethane	10.0	10.1		ug/L		101	68 - 118
Tetrachloroethene	10.0	9.85		ug/L		99	79 - 114
Toluene	10.0	10.3		ug/L		103	84 - 111
Trichloroethene	10.0	9.86		ug/L		99	76 - 117
Vinyl chloride	10.0	8.27		ug/L		83	53 - 127
Xylenes, Total	30.0	31.7		ug/L		106	83 - 112
1,1,1-Trichloroethane	10.0	8.86		ug/L		89	74 - 118
1,1,2-Trichloroethane	10.0	10.4		ug/L		104	80 - 112
Cyclohexane	10.0	8.92		ug/L		89	54 - 121
1,2-Dibromo-3-Chloropropane	10.0	9.30		ug/L		93	42 - 136
1,2-Dibromoethane	10.0	9.93		ug/L		99	79 - 113
Dichlorodifluoromethane	10.0	7.82		ug/L		78	19 - 129
cis-1,2-Dichloroethene	10.0	9.71		ug/L		97	80 - 113
trans-1,2-Dichloroethene	10.0	9.99		ug/L		100	83 - 117
Isopropylbenzene	10.0	10.2		ug/L		102	75 - 114
Methyl acetate	10.0	8.74	J	ug/L		87	58 - 131
Methyl tert-butyl ether	10.0	8.46		ug/L		85	52 - 144
1,1,2-Trichloro-1,2,2-trifluoroethane	10.0	13.3		ug/L		133	74 - 151
1,2,4-Trichlorobenzene	10.0	6.97		ug/L		70	48 - 135
1,2-Dichlorobenzene	10.0	10.3		ug/L		103	81 - 110
1,3-Dichlorobenzene	10.0	10.4		ug/L		104	80 - 110
1,4-Dichlorobenzene	10.0	10.2		ug/L		102	82 - 110
Trichlorofluoromethane	10.0	8.35		ug/L		83	49 - 157
Dibromochloromethane	10.0	10.2		ug/L		102	64 - 119
Methylcyclohexane	10.0	9.17		ug/L		92	56 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*63 - 129*
4-Bromofluorobenzene (Surr)	*96*		*66 - 117*
Toluene-d8 (Surr)	*93*		*74 - 115*
Dibromofluoromethane (Surr)	*88*		*75 - 121*

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-76773/17-A
Matrix: Solid
Analysis Batch: 77119

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 76773

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Benzo[a]pyrene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Benzo[b]fluoranthene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Benzo[g,h,i]perylene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Benzo[k]fluoranthene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Anthracene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Chrysene	1.1	U	260	1.1	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Dibenz(a,h)anthracene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Fluoranthene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Fluorene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Indeno[1,2,3-cd]pyrene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Phenanthrene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Pyrene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Acenaphthene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Acenaphthylene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
Naphthalene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1
2-Methylnaphthalene	3.3	U	260	3.3	ug/Kg		02/28/13 09:45	03/04/13 14:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*71*		*24 - 110*	*02/28/13 09:45*	*03/04/13 14:41*	*1*
2-Fluorophenol (Surr)	*57*		*24 - 110*	*02/28/13 09:45*	*03/04/13 14:41*	*1*
2,4,6-Tribromophenol (Surr)	*39*		*10 - 110*	*02/28/13 09:45*	*03/04/13 14:41*	*1*
Nitrobenzene-d5 (Surr)	*69*		*20 - 110*	*02/28/13 09:45*	*03/04/13 14:41*	*1*
Phenol-d5 (Surr)	*57*		*26 - 110*	*02/28/13 09:45*	*03/04/13 14:41*	*1*
Terphenyl-d14 (Surr)	*100*		*36 - 110*	*02/28/13 09:45*	*03/04/13 14:41*	*1*

Lab Sample ID: LCS 240-76773/18-A
Matrix: Solid
Analysis Batch: 77119

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 76773

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzo[a]anthracene	667	485		ug/Kg		73	50 - 110
Benzo[a]pyrene	667	534		ug/Kg		80	44 - 110
Benzo[b]fluoranthene	667	570		ug/Kg		85	43 - 110
Benzo[g,h,i]perylene	667	599		ug/Kg		90	51 - 110
Benzo[k]fluoranthene	667	626		ug/Kg		94	38 - 105
Anthracene	667	516		ug/Kg		77	48 - 110
Chrysene	667	555		ug/Kg		83	50 - 110
Dibenz(a,h)anthracene	667	554		ug/Kg		83	51 - 110
Fluoranthene	667	507		ug/Kg		76	51 - 110
Fluorene	667	485		ug/Kg		73	46 - 110
Indeno[1,2,3-cd]pyrene	667	550		ug/Kg		82	50 - 110
Phenanthrene	667	500		ug/Kg		75	49 - 110
Pyrene	667	515		ug/Kg		77	49 - 110
Acenaphthene	667	458		ug/Kg		69	38 - 110
Acenaphthylene	667	465		ug/Kg		70	40 - 110
Naphthalene	667	427		ug/Kg		64	36 - 110
2-Methylnaphthalene	667	449		ug/Kg		67	36 - 110

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-76773/18-A
Matrix: Solid
Analysis Batch: 77119

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 76773

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	64		24 - 110
2-Fluorophenol (Surr)	53		24 - 110
2,4,6-Tribromophenol (Surr)	53		10 - 110
Nitrobenzene-d5 (Surr)	61		20 - 110
Phenol-d5 (Surr)	53		26 - 110
Terphenyl-d14 (Surr)	82		36 - 110

GC/MS VOA

Prep Batch: 76655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21427-1	SB-1-13-2.5'	Total/NA	Solid	5035	
240-21427-2	SB-1-13-5'	Total/NA	Solid	5035	
240-21427-3	SB-3-13-5'	Total/NA	Solid	5035	
240-21427-4	SB-5-13-4.5-5'	Total/NA	Solid	5035	
240-21427-5	TW-2-13-6'	Total/NA	Solid	5035	
240-21427-8	MW-6R-13(10')	Total/NA	Solid	5035	
240-21427-9	MW-6R-13(11')	Total/NA	Solid	5035	
240-21427-10	MW-13-13(8')	Total/NA	Solid	5035	
LCS 240-76655/2-A	Lab Control Sample	Total/NA	Solid	5035	
MB 240-76655/1-A	Method Blank	Total/NA	Solid	5035	

Analysis Batch: 76797

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21427-1	SB-1-13-2.5'	Total/NA	Solid	8260B	76655
240-21427-2	SB-1-13-5'	Total/NA	Solid	8260B	76655
240-21427-3	SB-3-13-5'	Total/NA	Solid	8260B	76655
240-21427-4	SB-5-13-4.5-5'	Total/NA	Solid	8260B	76655
240-21427-5	TW-2-13-6'	Total/NA	Solid	8260B	76655
240-21427-9	MW-6R-13(11')	Total/NA	Solid	8260B	76655
LCS 240-76655/2-A	Lab Control Sample	Total/NA	Solid	8260B	76655
MB 240-76655/1-A	Method Blank	Total/NA	Solid	8260B	76655

Analysis Batch: 76949

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21427-8	MW-6R-13(10')	Total/NA	Solid	8260B	76655
240-21427-10	MW-13-13(8')	Total/NA	Solid	8260B	76655

Analysis Batch: 77112

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21427-6	TW-1-13	Total/NA	Water	8260B	
240-21427-7	TW-2-13	Total/NA	Water	8260B	
240-21427-11	TRIP BLANK	Total/NA	Water	8260B	
LCS 240-77112/4	Lab Control Sample	Total/NA	Water	8260B	
MB 240-77112/5	Method Blank	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 76773

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21427-1	SB-1-13-2.5'	Total/NA	Solid	3540C	
240-21427-2	SB-1-13-5'	Total/NA	Solid	3540C	
240-21427-3	SB-3-13-5'	Total/NA	Solid	3540C	
240-21427-4	SB-5-13-4.5-5'	Total/NA	Solid	3540C	
240-21427-8	MW-6R-13(10')	Total/NA	Solid	3540C	
240-21427-8 - RA	MW-6R-13(10')	Total/NA	Solid	3540C	
LCS 240-76773/18-A	Lab Control Sample	Total/NA	Solid	3540C	
MB 240-76773/17-A	Method Blank	Total/NA	Solid	3540C	

GC/MS Semi VOA (Continued)

Analysis Batch: 77119

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21427-1	SB-1-13-2.5'	Total/NA	Solid	8270C	76773
240-21427-2	SB-1-13-5'	Total/NA	Solid	8270C	76773
240-21427-3	SB-3-13-5'	Total/NA	Solid	8270C	76773
240-21427-8	MW-6R-13(10')	Total/NA	Solid	8270C	76773
LCS 240-76773/18-A	Lab Control Sample	Total/NA	Solid	8270C	76773
MB 240-76773/17-A	Method Blank	Total/NA	Solid	8270C	76773

Analysis Batch: 77296

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21427-4	SB-5-13-4.5-5'	Total/NA	Solid	8270C	76773
240-21427-8 - RA	MW-6R-13(10')	Total/NA	Solid	8270C	76773

General Chemistry

Analysis Batch: 76892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21427-1	SB-1-13-2.5'	Total/NA	Solid	Moisture	
240-21427-1 DU	SB-1-13-2.5'	Total/NA	Solid	Moisture	
240-21427-2	SB-1-13-5'	Total/NA	Solid	Moisture	
240-21427-3	SB-3-13-5'	Total/NA	Solid	Moisture	
240-21427-4	SB-5-13-4.5-5'	Total/NA	Solid	Moisture	
240-21427-5	TW-2-13-6'	Total/NA	Solid	Moisture	
240-21427-8	MW-6R-13(10')	Total/NA	Solid	Moisture	
240-21427-9	MW-6R-13(11')	Total/NA	Solid	Moisture	
240-21427-10	MW-13-13(8')	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: SB-1-13-2.5'

Lab Sample ID: 240-21427-1
Date Collected: 02/24/13 09:05
Matrix: Solid
Date Received: 02/26/13 09:15
Percent Solids: 79.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			76655	02/27/13 12:14	LM	TAL NC
Total/NA	Analysis	8260B		1	76797	02/28/13 14:38	RQ	TAL NC
Total/NA	Prep	3540C			76773	02/28/13 09:45	AC	TAL NC
Total/NA	Analysis	8270C		50	77119	03/04/13 23:43	JG	TAL NC
Total/NA	Analysis	Moisture		1	76892	02/28/13 17:33	AM	TAL NC

Client Sample ID: SB-1-13-5'

Lab Sample ID: 240-21427-2
Date Collected: 02/24/13 09:08
Matrix: Solid
Date Received: 02/26/13 09:15
Percent Solids: 79.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			76655	02/27/13 12:14	LM	TAL NC
Total/NA	Analysis	8260B		1	76797	02/28/13 15:05	RQ	TAL NC
Total/NA	Prep	3540C			76773	02/28/13 09:45	AC	TAL NC
Total/NA	Analysis	8270C		1	77119	03/04/13 20:11	JG	TAL NC
Total/NA	Analysis	Moisture		1	76892	02/28/13 17:33	AM	TAL NC

Client Sample ID: SB-3-13-5'

Lab Sample ID: 240-21427-3
Date Collected: 02/24/13 10:00
Matrix: Solid
Date Received: 02/26/13 09:15
Percent Solids: 88.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			76655	02/27/13 12:14	LM	TAL NC
Total/NA	Analysis	8260B		1	76797	02/28/13 15:31	RQ	TAL NC
Total/NA	Prep	3540C			76773	02/28/13 09:45	AC	TAL NC
Total/NA	Analysis	8270C		1	77119	03/04/13 19:47	JG	TAL NC
Total/NA	Analysis	Moisture		1	76892	02/28/13 17:33	AM	TAL NC

Client Sample ID: SB-5-13-4.5-5'

Lab Sample ID: 240-21427-4
Date Collected: 02/24/13 10:45
Matrix: Solid
Date Received: 02/26/13 09:15
Percent Solids: 85.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			76655	02/27/13 12:14	LM	TAL NC
Total/NA	Analysis	8260B		1	76797	02/28/13 15:57	RQ	TAL NC
Total/NA	Prep	3540C			76773	02/28/13 09:45	AC	TAL NC
Total/NA	Analysis	8270C		2.5	77296	03/05/13 21:59	JG	TAL NC
Total/NA	Analysis	Moisture		1	76892	02/28/13 17:33	AM	TAL NC

Lab Chronicle

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: TW-2-13-6'

Lab Sample ID: 240-21427-5

Date Collected: 02/24/13 12:30
Matrix: Solid
Date Received: 02/26/13 09:15
Percent Solids: 94.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			76655	02/27/13 12:14	LM	TAL NC
Total/NA	Analysis	8260B		1	76797	02/28/13 16:24	RQ	TAL NC
Total/NA	Analysis	Moisture		1	76892	02/28/13 17:33	AM	TAL NC

Client Sample ID: TW-1-13

Lab Sample ID: 240-21427-6

Date Collected: 02/24/13 13:05
Matrix: Water
Date Received: 02/26/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		5	77112	03/04/13 16:28	RQ	TAL NC

Client Sample ID: TW-2-13

Lab Sample ID: 240-21427-7

Date Collected: 02/24/13 15:35
Matrix: Water
Date Received: 02/26/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		5	77112	03/04/13 16:50	RQ	TAL NC

Client Sample ID: MW-6R-13(10')

Lab Sample ID: 240-21427-8

Date Collected: 02/24/13 09:40
Matrix: Solid
Date Received: 02/26/13 09:15
Percent Solids: 86.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			76655	02/27/13 12:14	LM	TAL NC
Total/NA	Analysis	8260B		33.333	76949	03/01/13 13:23	RQ	TAL NC
Total/NA	Prep	3540C			76773	02/28/13 09:45	AC	TAL NC
Total/NA	Analysis	8270C		1	77119	03/04/13 19:00	JG	TAL NC
Total/NA	Prep	3540C	RA		76773	02/28/13 09:45	AC	TAL NC
Total/NA	Analysis	8270C	RA	4	77296	03/05/13 21:12	JG	TAL NC
Total/NA	Analysis	Moisture		1	76892	02/28/13 17:33	AM	TAL NC

Client Sample ID: MW-6R-13(11')

Lab Sample ID: 240-21427-9

Date Collected: 02/24/13 11:30
Matrix: Solid
Date Received: 02/26/13 09:15
Percent Solids: 83.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			76655	02/27/13 12:14	LM	TAL NC
Total/NA	Analysis	8260B		6.667	76797	02/28/13 17:43	RQ	TAL NC
Total/NA	Analysis	Moisture		1	76892	02/28/13 17:33	AM	TAL NC

Lab Chronicle

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Client Sample ID: MW-13-13(8')

Lab Sample ID: 240-21427-10

Date Collected: 02/24/13 15:00
Matrix: Solid
Date Received: 02/26/13 09:15
Percent Solids: 48.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			76655	02/27/13 12:14	LM	TAL NC
Total/NA	Analysis	8260B		1	76949	03/01/13 11:45	RQ	TAL NC
Total/NA	Analysis	Moisture		1	76892	02/28/13 17:33	AM	TAL NC

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-21427-11

Date Collected: 02/24/13 00:00
Matrix: Water
Date Received: 02/26/13 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	77112	03/04/13 17:11	RQ	TAL NC

Laboratory References:

TAL NC = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Certification Summary

Client: Tetra Tech GEO
Project/Site: 415 W Washington Phase II

TestAmerica Job ID: 240-21427-1

Laboratory: TestAmerica Canton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-13
Connecticut	State Program	1	PH-0590	12-31-13
Florida	NELAP	4	E87225	06-30-13
Georgia	State Program	4	N/A	06-30-13
Illinois	NELAP	5	200004	07-31-13
Kansas	NELAP	7	E-10336	01-31-14
Kentucky	State Program	4	58	06-30-13
L-A-B	DoD ELAP		L2315	07-28-13
Minnesota	NELAP	5	039-999-348	12-31-13
Nevada	State Program	9	OH-000482008A	07-31-13
New Jersey	NELAP	2	OH001	06-30-13
New York	NELAP	2	10975	04-01-13
Ohio VAP	State Program	5	CL0024	01-19-14
Pennsylvania	NELAP	3	68-00340	08-31-13
Texas	NELAP	6		08-03-13
USDA	Federal		P330-11-00328	08-26-14
Virginia	NELAP	3	460175	09-14-13
Washington	State Program	10	C971	01-12-14
West Virginia DEP	State Program	3	210	12-31-13
Wisconsin	State Program	5	999518190	08-31-13

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: _____
Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other _____

TestAmerica Laboratories, Inc.

Client Contact				
Company Name: Tetra Tech	Client Project Manager: Patti McCall	Site Contact: Joy Bryzenia	Lab Contact: Kris Brooks	COC No: 054859
Address: 710 Avis Dr.	Telephone: 734-213-4069	Telephone:	Telephone:	1 of 2 COCs
City/State/Zip: Ann Arbor, MI 48108	Email: patti.mccall@tetratech.com	Analysis Turnaround Time (in BUS days)	Analyses	For lab use only
Phone:		TAT if different from below: Standard		Walk-in client ☐
Project Name: 415 W. Washington Phase II	Method of Shipment/Carrier:	☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Lab pickup ☐
Project Number: 117-105401102	Shipping/Tracking No:			Lab sampling ☐
PO#				Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other: MeOH	Filtered Sample (Y/N)	Composite (C) or Grab (G)	VOCs	PNAs	dry weight	Sample Specific Notes / Special Instructions:
SB-1-13-2.5'	2/24/13	9:05				X							2	1			X	X	X	
SB-1-13-5'	2/24/13	9:08				X							1	1			X	X	X	
SB-3-13-5'	2/24/13	10:00				X							2	1			X	X	X	
SB-5-13-4.5-5'	2/24/13	10:45				X							2	1			X	X	X	
TW-2-13-6'	2/24/13	12:30				X							1	1			X		X	
TW-1-13	2/24/13	13:05		X						3							X			
TW-2-13	2/24/13	15:35		X						3							X			
MW-6R-13 (10')	2/24/13	9:40				X							2	1			X	X	X	
MW-6R-13(11')	2/24/13	11:30				X							1	1			X		X	
MW-13-13 (8')	2/24/13	1500				X							1	1			X		X	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☒ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	TT	2/24/13 17:30	Cold Storage	TT	2/24/13 17:30
[signature] (COLD STORAGE)	TT	2/25/13 12:30	[signature]	TEST AMERICA	2/25/13 12:30
[signature]	TEST AMERICA	2/25/13 16:37	Received in Laboratory by: [signature]	TA	2-26-13 915

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TAL 0018-1 (04/10)

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: _____

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other _____

TestAmerica Laboratories, Inc.

Client Contact				
Company Name: Tetra Tech	Client Project Manager: Patti McCall	Site Contact: Joy Bryzem	Lab Contact: Kris Brooks	COC No: 054950
Address: 710 Avis Dr.	Telephone: 734-213-4069	Telephone:	Telephone:	2 of 2 COCs
City/State/Zip: Ann Arbor, MI 48108	Email:	Analysis Turnaround Time (in BUS days)	Analyses	For lab use only
Phone:		TAT if different from below Standard		Walk-in client: ☐
Project Name: 415 W. Washington Phase II	Method of Shipment/Carrier:	☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Lab pickup: ☐
Project Number: 117-10540II/02	Shipping/Tracking No:			Lab sampling: ☐
PO#				Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite C / Grab G	VOCs	Sample Specific Notes / Special Instructions:
Trip Blank	2/24/13	—		X						1							X	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☒ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Tt	2/24/13 17:30	Cold storage	Tt	2/24/13 17:30
Relinquished by: [signature] (COLD STORAGE)	Company: Tt	Date/Time: 2/25/13 12:30	Received by: [signature]	Company: TEST AMERICA	Date/Time: 2/25/13 12:30
Relinquished by: [signature]	Company: TEST AMERICA	Date/Time: 2/25/13 16:37	Received in Laboratory by: [signature]	Company: TA	Date/Time: 2-26-13 915

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TAL 0018-1 (04/10)

3/7/2013

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 21427

Client Tetra Tech Site Name _____ By: [signature]

Cooler Received on 2-26-13 Opened on 2-26-13 (Signature)

FedEx: 1st Grd Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt
   - IR GUN# 1 (CF –2 °C) Observed Sample Temp. ____ °C Corrected Sample Temp. ____ °C
   - IR GUN# 4G (CF 0 °C) Observed Sample Temp. 3.8 °C Corrected Sample Temp. 3.8 °C ☐ Multiple on Back
   - IR GUN# 5G (CF 0 °C) Observed Sample Temp. ____ °C Corrected Sample Temp. ____ °C
   - IR GUN# 8 (CF 0 °C) Observed Sample Temp. ____ °C Corrected Sample Temp. ____ °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 0 Yes No
   - Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
   - Were custody seals on the bottle(s)? Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Did all bottles arrive in good condition (Unbroken)? Yes No
7. Could all bottle labels be reconciled with the COC? Yes No
8. Were correct bottle(s) used for the test(s) indicated? Yes No
9. Sufficient quantity received to perform indicated analyses? Yes No
10. Were sample(s) at the correct pH upon receipt? Yes No NA
11. Were VOAs on the COC? Yes No
12. Were air bubbles >6 mm in any VOA vials? Yes No NA
13. Was a trip blank present in the cooler(s)? Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

15. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in Sample Receiving to meet recommended pH level(s). Nitric Acid Lot# 031512-HNO3; Sulfuric Acid Lot# 051012-H2SO4; Sodium Hydroxide Lot# 121809 -NaOH; Hydrochloric Acid Lot# 041911-HCl; Sodium Hydroxide and Zinc Acetate Lot# 100108-(CH3COO)2ZN/NaOH. What time was preservative added to sample(s)?

Client ID	pH	Date	Initials

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-21836-1
Client Project/Site: 415 West Washington - 117-1054011.02

For:
Tetra Tech GEO
710 Avis Drive
Ann Arbor, Michigan 48108

Attn: Patti McCall

Patrick O'Meara

Authorized for release by:
3/22/2013 5:04:07 PM
Patrick O'Meara
Project Manager II
patrick.omeara@testamericainc.com

Designee for

Kris Brooks
Project Manager II
kris.brooks@testamericainc.com

LINKS

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
*	LCS or LCSD exceeds the control limits
F	MS or MSD exceeds the control limits

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 240-21836-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: Tetra Tech GEO

Project: 415 West Washington - 117-1054011.02

Report Number: 240-21836-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

The 6020 Dissolved Metals and 7470A Dissolved Mercury analysis were performed at the TestAmerica Pittsburgh Laboratory.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 03/09/2013; the samples arrived in good condition, properly preserved and on ice. The temperatures of the coolers at receipt were 2.4 and 2.6 C.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples MW-6R-13 (240-21836-1), MW-1R-13 (240-21836-3), MW-11R-13 (240-21836-4), MW-3R-13 (240-21836-5), MW-13-13 (240-21836-6) and TRIP BLANK (240-21836-7) were analyzed for volatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 03/15/2013 and 03/18/2013.

1,2,4-Trichlorobenzene and Methylene Chloride were detected in method blank MB 240-78499/5 at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged "J". If the associated sample reported a result above the MDL and/or RL, the result has been "B" flagged. 1,2,4-Trichlorobenzene and Methylene Chloride were detected in method blank MB 240-78611/5 at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged "J". If the associated sample reported a result above the MDL and/or RL, the result has been "B" flagged.

The laboratory control sample (LCS) for batch 78499 exceeded control limits for the following analyte(s): Trichlorofluoromethane--has been identified as a poor performing analyte when analyzed using this method; therefore, re-extraction/re-analysis was not performed.

The laboratory control sample (LCS) for batch 78611 exceeded control limits for the following analyte(s): Trichlorofluoromethane--has

Job ID: 240-21836-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

been identified as a poor performing analyte when analyzed using this method; therefore, re-extraction/re-analysis was not performed.

Trichlorofluoromethane failed the recovery criteria high for the MS/MSD of sample MW-13-13 (240-21836-6) in batch 240-78611.

Samples MW-6R-13 (240-21836-1)[1.43X], MW-1R-13 (240-21836-3)[5X], MW-11R-13 (240-21836-4)[12.5X] and MW-13-13 (240-21836-6) [6.67X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Method 8260 stipulates a 12 hour sequence for the analysis of samples.The MSD for sample 21836-6 exceeded the 12 hour time limit by 13 minutes. The MS/MSD was reported for batch QC.

No other difficulties were encountered during the VOCs analyses. All other quality control parameters were within the acceptance limits.

SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples MW-6R-13 (240-21836-1), MW-1R-13 (240-21836-3), MW-11R-13 (240-21836-4) and MW-3R-13 (240-21836-5) were analyzed for semivolatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8270C. The samples were prepared on 03/12/2013 and analyzed on 03/14/2013.

Surrogates are added during the extraction process prior to dilution. When the sample is diluted, surrogate recoveries are diluted out and no corrective action is required.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with batch 78024.

No other difficulties were encountered during the SVOCs analyses. All quality control parameters were within the acceptance limits.

DISSOLVED METALS (ICPMS)

Sample MW-6R-13 (240-21836-1) was analyzed for dissolved metals (ICPMS) in accordance with EPA SW-846 Method 6020. The samples were prepared on 03/13/2013 and analyzed on 03/16/2013.

Lead and Lead were detected in method blank MB 180-66191/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged “J”. If the associated sample reported a result above the MDL and/or RL, the result has been “B” flagged.

No difficulties were encountered during the metals analysis. All quality control parameters were within the acceptance limits.

DISSOLVED MERCURY (CVAA)

Samples MW-6R-13 (240-21836-1) and MW-8 (240-21836-2) were analyzed for dissolved mercury (CVAA) in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 03/13/2013.

No difficulties were encountered during the mercury analyses. All quality control parameters were within the acceptance limits.

Method Summary

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL NC
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL NC
6020	Metals (ICP/MS)	SW846	TAL PIT
7470A	Mercury (CVAA)	SW846	TAL PIT

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL NC = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-21836-1	MW-6R-13	Water	03/07/13 10:45	03/09/13 09:30
240-21836-2	MW-8	Water	03/07/13 11:18	03/09/13 09:30
240-21836-3	MW-1R-13	Water	03/07/13 11:56	03/09/13 09:30
240-21836-4	MW-11R-13	Water	03/07/13 12:55	03/09/13 09:30
240-21836-5	MW-3R-13	Water	03/07/13 14:15	03/09/13 09:30
240-21836-6	MW-13-13	Water	03/07/13 14:56	03/09/13 09:30
240-21836-7	TRIP BLANK	Water	03/07/13 00:00	03/09/13 09:30

Detection Summary

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-6R-13 — Lab Sample ID: 240-21836-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	12		1.4	0.24	ug/L	1.43		8260B	Total/NA
Methylene Chloride	1.6	J B	7.2	0.47	ug/L	1.43		8260B	Total/NA
Toluene	1.4		1.4	0.19	ug/L	1.43		8260B	Total/NA
Xylenes, Total	66		2.9	0.40	ug/L	1.43		8260B	Total/NA
Cyclohexane	21		1.4	0.17	ug/L	1.43		8260B	Total/NA
Isopropylbenzene	2.8		1.4	0.19	ug/L	1.43		8260B	Total/NA
Methylcyclohexane	56		1.4	0.19	ug/L	1.43		8260B	Total/NA
Naphthalene	7.4		4.8	0.095	ug/L	1		8270C	Total/NA
2-Methylnaphthalene	4.3	J	4.8	0.095	ug/L	1		8270C	Total/NA
Barium	120		10	0.098	ug/L	1		6020	Dissolved
Chromium	0.73	J	2.0	0.54	ug/L	1		6020	Dissolved
Sodium	330000		100	3.8	ug/L	1		6020	Dissolved
Nickel	0.40	J	1.0	0.17	ug/L	1		6020	Dissolved
Lead	0.57	J B	1.0	0.019	ug/L	1		6020	Dissolved
Selenium	0.80	J	5.0	0.42	ug/L	1		6020	Dissolved
Zinc	4.2	J	5.0	0.96	ug/L	1		6020	Dissolved

Client Sample ID: MW-8 — Lab Sample ID: 240-21836-2

No Detections.

Client Sample ID: MW-1R-13 — Lab Sample ID: 240-21836-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	46		5.0	0.65	ug/L	5		8260B	Total/NA
Ethylbenzene	31		5.0	0.85	ug/L	5		8260B	Total/NA
Methylene Chloride	4.0	J B	25	1.7	ug/L	5		8260B	Total/NA
Toluene	1.0	J	5.0	0.65	ug/L	5		8260B	Total/NA
Xylenes, Total	18		10	1.4	ug/L	5		8260B	Total/NA
Isopropylbenzene	11		5.0	0.65	ug/L	5		8260B	Total/NA
Methylcyclohexane	8.2		5.0	0.65	ug/L	5		8260B	Total/NA
Fluoranthene	0.23	J	0.95	0.095	ug/L	1		8270C	Total/NA
Fluorene	1.1	J	4.8	0.095	ug/L	1		8270C	Total/NA
Phenanthrene	1.2	J	1.9	0.095	ug/L	1		8270C	Total/NA
Pyrene	0.16	J	4.8	0.095	ug/L	1		8270C	Total/NA
Acenaphthene	0.36	J	4.8	0.095	ug/L	1		8270C	Total/NA
Acenaphthylene	0.21	J	4.8	0.095	ug/L	1		8270C	Total/NA
Naphthalene	4.6	J	4.8	0.095	ug/L	1		8270C	Total/NA
2-Methylnaphthalene	1.8	J	4.8	0.095	ug/L	1		8270C	Total/NA

Client Sample ID: MW-11R-13 — Lab Sample ID: 240-21836-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	420		13	1.6	ug/L	12.5		8260B	Total/NA
Methylene Chloride	20	J B	63	4.1	ug/L	12.5		8260B	Total/NA
Toluene	4.1	J	13	1.6	ug/L	12.5		8260B	Total/NA
Xylenes, Total	19	J	25	3.5	ug/L	12.5		8260B	Total/NA
Cyclohexane	38		13	1.5	ug/L	12.5		8260B	Total/NA
Isopropylbenzene	24		13	1.6	ug/L	12.5		8260B	Total/NA
Methylcyclohexane	12	J	13	1.6	ug/L	12.5		8260B	Total/NA
Acenaphthene	0.60	J	4.8	0.095	ug/L	1		8270C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-11R-13 (Continued) — Lab Sample ID: 240-21836-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	48		4.8	0.095	ug/L	1		8270C	Total/NA
2-Methylnaphthalene	2.5	J	4.8	0.095	ug/L	1		8270C	Total/NA

Client Sample ID: MW-3R-13 — Lab Sample ID: 240-21836-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.47	J	1.0	0.17	ug/L	1		8260B	Total/NA
Isopropylbenzene	0.18	J	1.0	0.13	ug/L	1		8260B	Total/NA
Fluorene	3.5	J	4.8	0.095	ug/L	1		8270C	Total/NA
Phenanthrene	2.3		1.9	0.095	ug/L	1		8270C	Total/NA
Acenaphthene	2.7	J	4.8	0.095	ug/L	1		8270C	Total/NA
Acenaphthylene	0.59	J	4.8	0.095	ug/L	1		8270C	Total/NA

Client Sample ID: MW-13-13 — Lab Sample ID: 240-21836-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Carbon tetrachloride	1.6	J	6.7	0.87	ug/L	6.67		8260B	Total/NA
Chloroform	7.4		6.7	1.1	ug/L	6.67		8260B	Total/NA
Methylene Chloride	3.5	J B	33	2.2	ug/L	6.67		8260B	Total/NA
Trichloroethene	190		6.7	1.1	ug/L	6.67		8260B	Total/NA
1,1,1-Trichloroethane	8.3		6.7	1.5	ug/L	6.67		8260B	Total/NA

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-21836-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	6.6	J	10	1.1	ug/L	1		8260B	Total/NA
Methylene Chloride	0.67	J B	5.0	0.33	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-6R-13
Date Collected: 03/07/13 10:45
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.6	U	14	1.6	ug/L			03/15/13 20:36	1.43
Benzene	0.19	U	1.4	0.19	ug/L			03/15/13 20:36	1.43
Bromodichloromethane	0.21	U	1.4	0.21	ug/L			03/15/13 20:36	1.43
Bromoform	0.92	U	1.4	0.92	ug/L			03/15/13 20:36	1.43
Bromomethane	0.59	U	1.4	0.59	ug/L			03/15/13 20:36	1.43
2-Butanone (MEK)	0.82	U	14	0.82	ug/L			03/15/13 20:36	1.43
Carbon disulfide	0.19	U	7.2	0.19	ug/L			03/15/13 20:36	1.43
Carbon tetrachloride	0.19	U	1.4	0.19	ug/L			03/15/13 20:36	1.43
Chlorobenzene	0.21	U	1.4	0.21	ug/L			03/15/13 20:36	1.43
Chloroethane	0.41	U	1.4	0.41	ug/L			03/15/13 20:36	1.43
Chloroform	0.23	U	1.4	0.23	ug/L			03/15/13 20:36	1.43
Chloromethane	0.43	U	1.4	0.43	ug/L			03/15/13 20:36	1.43
1,1-Dichloroethane	0.21	U	1.4	0.21	ug/L			03/15/13 20:36	1.43
1,2-Dichloroethane	0.31	U	1.4	0.31	ug/L			03/15/13 20:36	1.43
1,1-Dichloroethene	0.27	U	1.4	0.27	ug/L			03/15/13 20:36	1.43
1,2-Dichloropropane	0.26	U	1.4	0.26	ug/L			03/15/13 20:36	1.43
cis-1,3-Dichloropropene	0.20	U	1.4	0.20	ug/L			03/15/13 20:36	1.43
trans-1,3-Dichloropropene	0.27	U	1.4	0.27	ug/L			03/15/13 20:36	1.43
Ethylbenzene	**12**		1.4	0.24	ug/L			03/15/13 20:36	1.43
2-Hexanone	0.59	U	14	0.59	ug/L			03/15/13 20:36	1.43
Methylene Chloride	**1.6**	**J B**	7.2	0.47	ug/L			03/15/13 20:36	1.43
4-Methyl-2-pentanone (MIBK)	0.46	U	14	0.46	ug/L			03/15/13 20:36	1.43
Styrene	0.16	U	1.4	0.16	ug/L			03/15/13 20:36	1.43
1,1,2,2-Tetrachloroethane	0.26	U	1.4	0.26	ug/L			03/15/13 20:36	1.43
Tetrachloroethene	0.41	U	1.4	0.41	ug/L			03/15/13 20:36	1.43
Toluene	**1.4**		1.4	0.19	ug/L			03/15/13 20:36	1.43
Trichloroethene	0.24	U	1.4	0.24	ug/L			03/15/13 20:36	1.43
Vinyl chloride	0.31	U	1.4	0.31	ug/L			03/15/13 20:36	1.43
Xylenes, Total	**66**		2.9	0.40	ug/L			03/15/13 20:36	1.43
1,1,1-Trichloroethane	0.31	U	1.4	0.31	ug/L			03/15/13 20:36	1.43
1,1,2-Trichloroethane	0.39	U	1.4	0.39	ug/L			03/15/13 20:36	1.43
Cyclohexane	**21**		1.4	0.17	ug/L			03/15/13 20:36	1.43
1,2-Dibromo-3-Chloropropane	0.96	U	1.4	0.96	ug/L			03/15/13 20:36	1.43
1,2-Dibromoethane	0.34	U	1.4	0.34	ug/L			03/15/13 20:36	1.43
Dichlorodifluoromethane	0.44	U	1.4	0.44	ug/L			03/15/13 20:36	1.43
cis-1,2-Dichloroethene	0.24	U	1.4	0.24	ug/L			03/15/13 20:36	1.43
trans-1,2-Dichloroethene	0.27	U	1.4	0.27	ug/L			03/15/13 20:36	1.43
Isopropylbenzene	**2.8**		1.4	0.19	ug/L			03/15/13 20:36	1.43
Methyl acetate	0.54	U	14	0.54	ug/L			03/15/13 20:36	1.43
Methyl tert-butyl ether	0.24	U	1.4	0.24	ug/L			03/15/13 20:36	1.43
1,1,2-Trichloro-1,2,2-trifluoroethane	0.40	U	1.4	0.40	ug/L			03/15/13 20:36	1.43
1,2,4-Trichlorobenzene	0.21	U	1.4	0.21	ug/L			03/15/13 20:36	1.43
1,2-Dichlorobenzene	0.19	U	1.4	0.19	ug/L			03/15/13 20:36	1.43
1,3-Dichlorobenzene	0.20	U	1.4	0.20	ug/L			03/15/13 20:36	1.43
1,4-Dichlorobenzene	0.19	U	1.4	0.19	ug/L			03/15/13 20:36	1.43
Trichlorofluoromethane	0.30	U *	1.4	0.30	ug/L			03/15/13 20:36	1.43
Dibromochloromethane	0.26	U	1.4	0.26	ug/L			03/15/13 20:36	1.43
Methylcyclohexane	**56**		1.4	0.19	ug/L			03/15/13 20:36	1.43

Client Sample ID: MW-6R-13

Date Collected: 03/07/13 10:45
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-1

Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*63 - 129*		*03/15/13 20:36*	*1.43*
4-Bromofluorobenzene (Surr)	*99*		*66 - 117*		*03/15/13 20:36*	*1.43*
Toluene-d8 (Surr)	*98*		*74 - 115*		*03/15/13 20:36*	*1.43*
Dibromofluoromethane (Surr)	*76*		*75 - 121*		*03/15/13 20:36*	*1.43*

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Benzo[a]pyrene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Benzo[b]fluoranthene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Benzo[g,h,i]perylene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Benzo[k]fluoranthene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Anthracene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Chrysene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Dibenz(a,h)anthracene	0.095	U	1.9	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Fluoranthene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Fluorene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Indeno[1,2,3-cd]pyrene	0.095	U	1.9	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Phenanthrene	0.095	U	1.9	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Pyrene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Acenaphthene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Acenaphthylene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
Naphthalene	**7.4**		4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1
2-Methylnaphthalene	**4.3**	**J**	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	*61*		*20 - 110*	*03/12/13 11:22*	*03/14/13 11:30*	*1*
2-Fluorophenol (Surr)	*53*		*10 - 110*	*03/12/13 11:22*	*03/14/13 11:30*	*1*
2,4,6-Tribromophenol (Surr)	*58*		*21 - 110*	*03/12/13 11:22*	*03/14/13 11:30*	*1*
Nitrobenzene-d5 (Surr)	*68*		*21 - 110*	*03/12/13 11:22*	*03/14/13 11:30*	*1*
Phenol-d5 (Surr)	*53*		*21 - 110*	*03/12/13 11:22*	*03/14/13 11:30*	*1*
Terphenyl-d14 (Surr)	*77*		*24 - 110*	*03/12/13 11:22*	*03/14/13 11:30*	*1*

Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.036	U	1.0	0.036	ug/L		03/13/13 14:07	03/16/13 20:33	1
Arsenic	0.29	U	1.0	0.29	ug/L		03/13/13 14:07	03/16/13 20:33	1
Barium	**120**		10	0.098	ug/L		03/13/13 14:07	03/16/13 20:33	1
Cadmium	0.11	U	1.0	0.11	ug/L		03/13/13 14:07	03/16/13 20:33	1
Chromium	**0.73**	**J**	2.0	0.54	ug/L		03/13/13 14:07	03/16/13 20:33	1
Sodium	**330000**		100	3.8	ug/L		03/13/13 14:07	03/16/13 20:33	1
Nickel	**0.40**	**J**	1.0	0.17	ug/L		03/13/13 14:07	03/16/13 20:33	1
Lead	**0.57**	**J B**	1.0	0.019	ug/L		03/13/13 14:07	03/16/13 20:33	1
Selenium	**0.80**	**J**	5.0	0.42	ug/L		03/13/13 14:07	03/16/13 20:33	1
Zinc	**4.2**	**J**	5.0	0.96	ug/L		03/13/13 14:07	03/16/13 20:33	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038	U	0.20	0.038	ug/L		03/13/13 09:51	03/13/13 14:00	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-8
Date Collected: 03/07/13 11:18
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-2
Matrix: Water

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038	U	0.20	0.038	ug/L		03/13/13 09:51	03/13/13 14:05	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-1R-13
Date Collected: 03/07/13 11:56
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	5.5	U	50	5.5	ug/L			03/18/13 12:53	5
Benzene	**46**		5.0	0.65	ug/L			03/18/13 12:53	5
Bromodichloromethane	0.75	U	5.0	0.75	ug/L			03/18/13 12:53	5
Bromoform	3.2	U	5.0	3.2	ug/L			03/18/13 12:53	5
Bromomethane	2.1	U	5.0	2.1	ug/L			03/18/13 12:53	5
2-Butanone (MEK)	2.9	U	50	2.9	ug/L			03/18/13 12:53	5
Carbon disulfide	0.65	U	25	0.65	ug/L			03/18/13 12:53	5
Carbon tetrachloride	0.65	U	5.0	0.65	ug/L			03/18/13 12:53	5
Chlorobenzene	0.75	U	5.0	0.75	ug/L			03/18/13 12:53	5
Chloroethane	1.5	U	5.0	1.5	ug/L			03/18/13 12:53	5
Chloroform	0.80	U	5.0	0.80	ug/L			03/18/13 12:53	5
Chloromethane	1.5	U	5.0	1.5	ug/L			03/18/13 12:53	5
1,1-Dichloroethane	0.75	U	5.0	0.75	ug/L			03/18/13 12:53	5
1,2-Dichloroethane	1.1	U	5.0	1.1	ug/L			03/18/13 12:53	5
1,1-Dichloroethene	0.95	U	5.0	0.95	ug/L			03/18/13 12:53	5
1,2-Dichloropropane	0.90	U	5.0	0.90	ug/L			03/18/13 12:53	5
cis-1,3-Dichloropropene	0.70	U	5.0	0.70	ug/L			03/18/13 12:53	5
trans-1,3-Dichloropropene	0.95	U	5.0	0.95	ug/L			03/18/13 12:53	5
Ethylbenzene	**31**		5.0	0.85	ug/L			03/18/13 12:53	5
2-Hexanone	2.1	U	50	2.1	ug/L			03/18/13 12:53	5
Methylene Chloride	**4.0**	**J B**	25	1.7	ug/L			03/18/13 12:53	5
4-Methyl-2-pentanone (MIBK)	1.6	U	50	1.6	ug/L			03/18/13 12:53	5
Styrene	0.55	U	5.0	0.55	ug/L			03/18/13 12:53	5
1,1,2,2-Tetrachloroethane	0.90	U	5.0	0.90	ug/L			03/18/13 12:53	5
Tetrachloroethene	1.5	U	5.0	1.5	ug/L			03/18/13 12:53	5
Toluene	**1.0**	**J**	5.0	0.65	ug/L			03/18/13 12:53	5
Trichloroethene	0.85	U	5.0	0.85	ug/L			03/18/13 12:53	5
Vinyl chloride	1.1	U	5.0	1.1	ug/L			03/18/13 12:53	5
Xylenes, Total	**18**		10	1.4	ug/L			03/18/13 12:53	5
1,1,1-Trichloroethane	1.1	U	5.0	1.1	ug/L			03/18/13 12:53	5
1,1,2-Trichloroethane	1.4	U	5.0	1.4	ug/L			03/18/13 12:53	5
Cyclohexane	0.60	U	5.0	0.60	ug/L			03/18/13 12:53	5
1,2-Dibromo-3-Chloropropane	3.4	U	5.0	3.4	ug/L			03/18/13 12:53	5
1,2-Dibromoethane	1.2	U	5.0	1.2	ug/L			03/18/13 12:53	5
Dichlorodifluoromethane	1.6	U	5.0	1.6	ug/L			03/18/13 12:53	5
cis-1,2-Dichloroethene	0.85	U	5.0	0.85	ug/L			03/18/13 12:53	5
trans-1,2-Dichloroethene	0.95	U	5.0	0.95	ug/L			03/18/13 12:53	5
Isopropylbenzene	**11**		5.0	0.65	ug/L			03/18/13 12:53	5
Methyl acetate	1.9	U	50	1.9	ug/L			03/18/13 12:53	5
Methyl tert-butyl ether	0.85	U	5.0	0.85	ug/L			03/18/13 12:53	5
1,1,2-Trichloro-1,2,2-trifluoroethane	1.4	U	5.0	1.4	ug/L			03/18/13 12:53	5
1,2,4-Trichlorobenzene	0.75	U	5.0	0.75	ug/L			03/18/13 12:53	5
1,2-Dichlorobenzene	0.65	U	5.0	0.65	ug/L			03/18/13 12:53	5
1,3-Dichlorobenzene	0.70	U	5.0	0.70	ug/L			03/18/13 12:53	5
1,4-Dichlorobenzene	0.65	U	5.0	0.65	ug/L			03/18/13 12:53	5
Trichlorofluoromethane	1.1	U *	5.0	1.1	ug/L			03/18/13 12:53	5
Dibromochloromethane	0.90	U	5.0	0.90	ug/L			03/18/13 12:53	5
Methylcyclohexane	**8.2**		5.0	0.65	ug/L			03/18/13 12:53	5

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-1R-13
Date Collected: 03/07/13 11:56
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-3
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		63 - 129		03/18/13 12:53	5
4-Bromofluorobenzene (Surr)	88		66 - 117		03/18/13 12:53	5
Toluene-d8 (Surr)	90		74 - 115		03/18/13 12:53	5
Dibromofluoromethane (Surr)	81		75 - 121		03/18/13 12:53	5

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Benzo[a]pyrene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Benzo[b]fluoranthene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Benzo[g,h,i]perylene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Benzo[k]fluoranthene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Anthracene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Chrysene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Dibenz(a,h)anthracene	0.095	U	1.9	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Fluoranthene	**0.23**	**J**	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Fluorene	**1.1**	**J**	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Indeno[1,2,3-cd]pyrene	0.095	U	1.9	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Phenanthrene	**1.2**	**J**	1.9	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Pyrene	**0.16**	**J**	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Acenaphthene	**0.36**	**J**	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Acenaphthylene	**0.21**	**J**	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
Naphthalene	**4.6**	**J**	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1
2-Methylnaphthalene	**1.8**	**J**	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 11:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	64		20 - 110	03/12/13 11:22	03/14/13 11:52	1
2-Fluorophenol (Surr)	57		10 - 110	03/12/13 11:22	03/14/13 11:52	1
2,4,6-Tribromophenol (Surr)	60		21 - 110	03/12/13 11:22	03/14/13 11:52	1
Nitrobenzene-d5 (Surr)	70		21 - 110	03/12/13 11:22	03/14/13 11:52	1
Phenol-d5 (Surr)	56		21 - 110	03/12/13 11:22	03/14/13 11:52	1
Terphenyl-d14 (Surr)	80		24 - 110	03/12/13 11:22	03/14/13 11:52	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-11R-13
Date Collected: 03/07/13 12:55
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	14	U	130	14	ug/L			03/15/13 21:22	12.5
Benzene	**420**		13	1.6	ug/L			03/15/13 21:22	12.5
Bromodichloromethane	1.9	U	13	1.9	ug/L			03/15/13 21:22	12.5
Bromoform	8.0	U	13	8.0	ug/L			03/15/13 21:22	12.5
Bromomethane	5.1	U	13	5.1	ug/L			03/15/13 21:22	12.5
2-Butanone (MEK)	7.1	U	130	7.1	ug/L			03/15/13 21:22	12.5
Carbon disulfide	1.6	U	63	1.6	ug/L			03/15/13 21:22	12.5
Carbon tetrachloride	1.6	U	13	1.6	ug/L			03/15/13 21:22	12.5
Chlorobenzene	1.9	U	13	1.9	ug/L			03/15/13 21:22	12.5
Chloroethane	3.6	U	13	3.6	ug/L			03/15/13 21:22	12.5
Chloroform	2.0	U	13	2.0	ug/L			03/15/13 21:22	12.5
Chloromethane	3.8	U	13	3.8	ug/L			03/15/13 21:22	12.5
1,1-Dichloroethane	1.9	U	13	1.9	ug/L			03/15/13 21:22	12.5
1,2-Dichloroethane	2.8	U	13	2.8	ug/L			03/15/13 21:22	12.5
1,1-Dichloroethene	2.4	U	13	2.4	ug/L			03/15/13 21:22	12.5
1,2-Dichloropropane	2.3	U	13	2.3	ug/L			03/15/13 21:22	12.5
cis-1,3-Dichloropropene	1.8	U	13	1.8	ug/L			03/15/13 21:22	12.5
trans-1,3-Dichloropropene	2.4	U	13	2.4	ug/L			03/15/13 21:22	12.5
Ethylbenzene	2.1	U	13	2.1	ug/L			03/15/13 21:22	12.5
2-Hexanone	5.1	U	130	5.1	ug/L			03/15/13 21:22	12.5
Methylene Chloride	**20**	**J B**	63	4.1	ug/L			03/15/13 21:22	12.5
4-Methyl-2-pentanone (MIBK)	4.0	U	130	4.0	ug/L			03/15/13 21:22	12.5
Styrene	1.4	U	13	1.4	ug/L			03/15/13 21:22	12.5
1,1,2,2-Tetrachloroethane	2.3	U	13	2.3	ug/L			03/15/13 21:22	12.5
Tetrachloroethene	3.6	U	13	3.6	ug/L			03/15/13 21:22	12.5
Toluene	**4.1**	**J**	13	1.6	ug/L			03/15/13 21:22	12.5
Trichloroethene	2.1	U	13	2.1	ug/L			03/15/13 21:22	12.5
Vinyl chloride	2.8	U	13	2.8	ug/L			03/15/13 21:22	12.5
Xylenes, Total	**19**	**J**	25	3.5	ug/L			03/15/13 21:22	12.5
1,1,1-Trichloroethane	2.8	U	13	2.8	ug/L			03/15/13 21:22	12.5
1,1,2-Trichloroethane	3.4	U	13	3.4	ug/L			03/15/13 21:22	12.5
Cyclohexane	**38**		13	1.5	ug/L			03/15/13 21:22	12.5
1,2-Dibromo-3-Chloropropane	8.4	U	13	8.4	ug/L			03/15/13 21:22	12.5
1,2-Dibromoethane	3.0	U	13	3.0	ug/L			03/15/13 21:22	12.5
Dichlorodifluoromethane	3.9	U	13	3.9	ug/L			03/15/13 21:22	12.5
cis-1,2-Dichloroethene	2.1	U	13	2.1	ug/L			03/15/13 21:22	12.5
trans-1,2-Dichloroethene	2.4	U	13	2.4	ug/L			03/15/13 21:22	12.5
Isopropylbenzene	**24**		13	1.6	ug/L			03/15/13 21:22	12.5
Methyl acetate	4.8	U	130	4.8	ug/L			03/15/13 21:22	12.5
Methyl tert-butyl ether	2.1	U	13	2.1	ug/L			03/15/13 21:22	12.5
1,1,2-Trichloro-1,2,2-trifluoroethane	3.5	U	13	3.5	ug/L			03/15/13 21:22	12.5
1,2,4-Trichlorobenzene	1.9	U	13	1.9	ug/L			03/15/13 21:22	12.5
1,2-Dichlorobenzene	1.6	U	13	1.6	ug/L			03/15/13 21:22	12.5
1,3-Dichlorobenzene	1.8	U	13	1.8	ug/L			03/15/13 21:22	12.5
1,4-Dichlorobenzene	1.6	U	13	1.6	ug/L			03/15/13 21:22	12.5
Trichlorofluoromethane	2.6	U *	13	2.6	ug/L			03/15/13 21:22	12.5
Dibromochloromethane	2.3	U	13	2.3	ug/L			03/15/13 21:22	12.5
Methylcyclohexane	**12**	**J**	13	1.6	ug/L			03/15/13 21:22	12.5

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-11R-13
Date Collected: 03/07/13 12:55
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-4
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		63 - 129		03/15/13 21:22	12.5
4-Bromofluorobenzene (Surr)	85		66 - 117		03/15/13 21:22	12.5
Toluene-d8 (Surr)	88		74 - 115		03/15/13 21:22	12.5
Dibromofluoromethane (Surr)	75		75 - 121		03/15/13 21:22	12.5

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Benzo[a]pyrene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Benzo[b]fluoranthene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Benzo[g,h,i]perylene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Benzo[k]fluoranthene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Anthracene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Chrysene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Dibenz(a,h)anthracene	0.095	U	1.9	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Fluoranthene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Fluorene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Indeno[1,2,3-cd]pyrene	0.095	U	1.9	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Phenanthrene	0.095	U	1.9	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Pyrene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Acenaphthene	**0.60**	**J**	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Acenaphthylene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
Naphthalene	**48**		4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1
2-Methylnaphthalene	**2.5**	**J**	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	67		20 - 110	03/12/13 11:22	03/14/13 12:14	1
2-Fluorophenol (Surr)	60		10 - 110	03/12/13 11:22	03/14/13 12:14	1
2,4,6-Tribromophenol (Surr)	65		21 - 110	03/12/13 11:22	03/14/13 12:14	1
Nitrobenzene-d5 (Surr)	72		21 - 110	03/12/13 11:22	03/14/13 12:14	1
Phenol-d5 (Surr)	60		21 - 110	03/12/13 11:22	03/14/13 12:14	1
Terphenyl-d14 (Surr)	81		24 - 110	03/12/13 11:22	03/14/13 12:14	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-3R-13
Date Collected: 03/07/13 14:15
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			03/15/13 21:45	1
Benzene	0.13	U	1.0	0.13	ug/L			03/15/13 21:45	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			03/15/13 21:45	1
Bromoform	0.64	U	1.0	0.64	ug/L			03/15/13 21:45	1
Bromomethane	0.41	U	1.0	0.41	ug/L			03/15/13 21:45	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			03/15/13 21:45	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			03/15/13 21:45	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			03/15/13 21:45	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			03/15/13 21:45	1
Chloroethane	0.29	U	1.0	0.29	ug/L			03/15/13 21:45	1
Chloroform	0.16	U	1.0	0.16	ug/L			03/15/13 21:45	1
Chloromethane	0.30	U	1.0	0.30	ug/L			03/15/13 21:45	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			03/15/13 21:45	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			03/15/13 21:45	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			03/15/13 21:45	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			03/15/13 21:45	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			03/15/13 21:45	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			03/15/13 21:45	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			03/15/13 21:45	1
2-Hexanone	0.41	U	10	0.41	ug/L			03/15/13 21:45	1
Methylene Chloride	0.33	U	5.0	0.33	ug/L			03/15/13 21:45	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			03/15/13 21:45	1
Styrene	0.11	U	1.0	0.11	ug/L			03/15/13 21:45	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			03/15/13 21:45	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			03/15/13 21:45	1
Toluene	0.13	U	1.0	0.13	ug/L			03/15/13 21:45	1
Trichloroethene	**0.47**	**J**	1.0	0.17	ug/L			03/15/13 21:45	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			03/15/13 21:45	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			03/15/13 21:45	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			03/15/13 21:45	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			03/15/13 21:45	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			03/15/13 21:45	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			03/15/13 21:45	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			03/15/13 21:45	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			03/15/13 21:45	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			03/15/13 21:45	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			03/15/13 21:45	1
Isopropylbenzene	**0.18**	**J**	1.0	0.13	ug/L			03/15/13 21:45	1
Methyl acetate	0.38	U	10	0.38	ug/L			03/15/13 21:45	1
Methyl tert-butyl ether	0.17	U	1.0	0.17	ug/L			03/15/13 21:45	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			03/15/13 21:45	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			03/15/13 21:45	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			03/15/13 21:45	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			03/15/13 21:45	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			03/15/13 21:45	1
Trichlorofluoromethane	0.21	U *	1.0	0.21	ug/L			03/15/13 21:45	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			03/15/13 21:45	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			03/15/13 21:45	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-3R-13
Date Collected: 03/07/13 14:15
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-5
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		63 - 129		03/15/13 21:45	1
4-Bromofluorobenzene (Surr)	86		66 - 117		03/15/13 21:45	1
Toluene-d8 (Surr)	84		74 - 115		03/15/13 21:45	1
Dibromofluoromethane (Surr)	80		75 - 121		03/15/13 21:45	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Benzo[a]pyrene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Benzo[b]fluoranthene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Benzo[g,h,i]perylene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Benzo[k]fluoranthene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Anthracene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Chrysene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Dibenz(a,h)anthracene	0.095	U	1.9	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Fluoranthene	0.095	U	0.95	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Fluorene	**3.5**	**J**	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Indeno[1,2,3-cd]pyrene	0.095	U	1.9	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Phenanthrene	**2.3**		1.9	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Pyrene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Acenaphthene	**2.7**	**J**	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Acenaphthylene	**0.59**	**J**	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
Naphthalene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1
2-Methylnaphthalene	0.095	U	4.8	0.095	ug/L		03/12/13 11:22	03/14/13 12:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	66		20 - 110	03/12/13 11:22	03/14/13 12:35	1
2-Fluorophenol (Surr)	60		10 - 110	03/12/13 11:22	03/14/13 12:35	1
2,4,6-Tribromophenol (Surr)	64		21 - 110	03/12/13 11:22	03/14/13 12:35	1
Nitrobenzene-d5 (Surr)	72		21 - 110	03/12/13 11:22	03/14/13 12:35	1
Phenol-d5 (Surr)	61		21 - 110	03/12/13 11:22	03/14/13 12:35	1
Terphenyl-d14 (Surr)	84		24 - 110	03/12/13 11:22	03/14/13 12:35	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-13-13
Date Collected: 03/07/13 14:56
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	7.3	U	67	7.3	ug/L			03/18/13 12:30	6.67
Benzene	0.87	U	6.7	0.87	ug/L			03/18/13 12:30	6.67
Bromodichloromethane	1.0	U	6.7	1.0	ug/L			03/18/13 12:30	6.67
Bromoform	4.3	U	6.7	4.3	ug/L			03/18/13 12:30	6.67
Bromomethane	2.7	U	6.7	2.7	ug/L			03/18/13 12:30	6.67
2-Butanone (MEK)	3.8	U	67	3.8	ug/L			03/18/13 12:30	6.67
Carbon disulfide	0.87	U	33	0.87	ug/L			03/18/13 12:30	6.67
Carbon tetrachloride	**1.6**	**J**	6.7	0.87	ug/L			03/18/13 12:30	6.67
Chlorobenzene	1.0	U	6.7	1.0	ug/L			03/18/13 12:30	6.67
Chloroethane	1.9	U	6.7	1.9	ug/L			03/18/13 12:30	6.67
Chloroform	**7.4**		6.7	1.1	ug/L			03/18/13 12:30	6.67
Chloromethane	2.0	U	6.7	2.0	ug/L			03/18/13 12:30	6.67
1,1-Dichloroethane	1.0	U	6.7	1.0	ug/L			03/18/13 12:30	6.67
1,2-Dichloroethane	1.5	U	6.7	1.5	ug/L			03/18/13 12:30	6.67
1,1-Dichloroethene	1.3	U	6.7	1.3	ug/L			03/18/13 12:30	6.67
1,2-Dichloropropane	1.2	U	6.7	1.2	ug/L			03/18/13 12:30	6.67
cis-1,3-Dichloropropene	0.93	U	6.7	0.93	ug/L			03/18/13 12:30	6.67
trans-1,3-Dichloropropene	1.3	U	6.7	1.3	ug/L			03/18/13 12:30	6.67
Ethylbenzene	1.1	U	6.7	1.1	ug/L			03/18/13 12:30	6.67
2-Hexanone	2.7	U	67	2.7	ug/L			03/18/13 12:30	6.67
Methylene Chloride	**3.5**	**J B**	33	2.2	ug/L			03/18/13 12:30	6.67
4-Methyl-2-pentanone (MIBK)	2.1	U	67	2.1	ug/L			03/18/13 12:30	6.67
Styrene	0.73	U	6.7	0.73	ug/L			03/18/13 12:30	6.67
1,1,2,2-Tetrachloroethane	1.2	U	6.7	1.2	ug/L			03/18/13 12:30	6.67
Tetrachloroethene	1.9	U	6.7	1.9	ug/L			03/18/13 12:30	6.67
Toluene	0.87	U	6.7	0.87	ug/L			03/18/13 12:30	6.67
Trichloroethene	**190**		6.7	1.1	ug/L			03/18/13 12:30	6.67
Vinyl chloride	1.5	U	6.7	1.5	ug/L			03/18/13 12:30	6.67
Xylenes, Total	1.9	U	13	1.9	ug/L			03/18/13 12:30	6.67
1,1,1-Trichloroethane	**8.3**		6.7	1.5	ug/L			03/18/13 12:30	6.67
1,1,2-Trichloroethane	1.8	U	6.7	1.8	ug/L			03/18/13 12:30	6.67
Cyclohexane	0.80	U	6.7	0.80	ug/L			03/18/13 12:30	6.67
1,2-Dibromo-3-Chloropropane	4.5	U	6.7	4.5	ug/L			03/18/13 12:30	6.67
1,2-Dibromoethane	1.6	U	6.7	1.6	ug/L			03/18/13 12:30	6.67
Dichlorodifluoromethane	2.1	U	6.7	2.1	ug/L			03/18/13 12:30	6.67
cis-1,2-Dichloroethene	1.1	U	6.7	1.1	ug/L			03/18/13 12:30	6.67
trans-1,2-Dichloroethene	1.3	U	6.7	1.3	ug/L			03/18/13 12:30	6.67
Isopropylbenzene	0.87	U	6.7	0.87	ug/L			03/18/13 12:30	6.67
Methyl acetate	2.5	U	67	2.5	ug/L			03/18/13 12:30	6.67
Methyl tert-butyl ether	1.1	U	6.7	1.1	ug/L			03/18/13 12:30	6.67
1,1,2-Trichloro-1,2,2-trifluoroethane	1.9	U	6.7	1.9	ug/L			03/18/13 12:30	6.67
1,2,4-Trichlorobenzene	1.0	U	6.7	1.0	ug/L			03/18/13 12:30	6.67
1,2-Dichlorobenzene	0.87	U	6.7	0.87	ug/L			03/18/13 12:30	6.67
1,3-Dichlorobenzene	0.93	U	6.7	0.93	ug/L			03/18/13 12:30	6.67
1,4-Dichlorobenzene	0.87	U	6.7	0.87	ug/L			03/18/13 12:30	6.67
Trichlorofluoromethane	1.4	U *	6.7	1.4	ug/L			03/18/13 12:30	6.67
Dibromochloromethane	1.2	U	6.7	1.2	ug/L			03/18/13 12:30	6.67
Methylcyclohexane	0.87	U	6.7	0.87	ug/L			03/18/13 12:30	6.67

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-13-13
Date Collected: 03/07/13 14:56
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-6
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		63 - 129		03/18/13 12:30	6.67
4-Bromofluorobenzene (Surr)	84		66 - 117		03/18/13 12:30	6.67
Toluene-d8 (Surr)	89		74 - 115		03/18/13 12:30	6.67
Dibromofluoromethane (Surr)	84		75 - 121		03/18/13 12:30	6.67

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: TRIP BLANK
Date Collected: 03/07/13 00:00
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**6.6**	**J**	10	1.1	ug/L			03/15/13 22:30	1
Benzene	0.13	U	1.0	0.13	ug/L			03/15/13 22:30	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			03/15/13 22:30	1
Bromoform	0.64	U	1.0	0.64	ug/L			03/15/13 22:30	1
Bromomethane	0.41	U	1.0	0.41	ug/L			03/15/13 22:30	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			03/15/13 22:30	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			03/15/13 22:30	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			03/15/13 22:30	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			03/15/13 22:30	1
Chloroethane	0.29	U	1.0	0.29	ug/L			03/15/13 22:30	1
Chloroform	0.16	U	1.0	0.16	ug/L			03/15/13 22:30	1
Chloromethane	0.30	U	1.0	0.30	ug/L			03/15/13 22:30	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			03/15/13 22:30	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			03/15/13 22:30	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			03/15/13 22:30	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			03/15/13 22:30	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			03/15/13 22:30	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			03/15/13 22:30	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			03/15/13 22:30	1
2-Hexanone	0.41	U	10	0.41	ug/L			03/15/13 22:30	1
Methylene Chloride	**0.67**	**J B**	5.0	0.33	ug/L			03/15/13 22:30	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			03/15/13 22:30	1
Styrene	0.11	U	1.0	0.11	ug/L			03/15/13 22:30	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			03/15/13 22:30	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			03/15/13 22:30	1
Toluene	0.13	U	1.0	0.13	ug/L			03/15/13 22:30	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			03/15/13 22:30	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			03/15/13 22:30	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			03/15/13 22:30	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			03/15/13 22:30	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			03/15/13 22:30	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			03/15/13 22:30	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			03/15/13 22:30	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			03/15/13 22:30	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			03/15/13 22:30	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			03/15/13 22:30	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			03/15/13 22:30	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			03/15/13 22:30	1
Methyl acetate	0.38	U	10	0.38	ug/L			03/15/13 22:30	1
Methyl tert-butyl ether	0.17	U	1.0	0.17	ug/L			03/15/13 22:30	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			03/15/13 22:30	1
1,2,4-Trichlorobenzene	0.15	U	1.0	0.15	ug/L			03/15/13 22:30	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			03/15/13 22:30	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			03/15/13 22:30	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			03/15/13 22:30	1
Trichlorofluoromethane	0.21	U *	1.0	0.21	ug/L			03/15/13 22:30	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			03/15/13 22:30	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			03/15/13 22:30	1

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: TRIP BLANK
Date Collected: 03/07/13 00:00
Date Received: 03/09/13 09:30

Lab Sample ID: 240-21836-7
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	85		63 - 129		03/15/13 22:30	1
4-Bromofluorobenzene (Surr)	83		66 - 117		03/15/13 22:30	1
Toluene-d8 (Surr)	86		74 - 115		03/15/13 22:30	1
Dibromofluoromethane (Surr)	79		75 - 121		03/15/13 22:30	1

Surrogate Summary

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		12DCE	BFB	TOL	DBFM				
Lab Sample ID	Client Sample ID	(63-129)	(66-117)	(74-115)	(75-121)				
240-21836-1	MW-6R-13	84	99	98	76				
240-21836-3	MW-1R-13	84	88	90	81				
240-21836-4	MW-11R-13	82	85	88	75				
240-21836-5	MW-3R-13	86	86	84	80				
240-21836-6	MW-13-13	87	84	89	84				
240-21836-6 MS	MW-13-13	89	94	93	88				
240-21836-6 MSD	MW-13-13	85	90	88	83				
240-21836-7	TRIP BLANK	85	83	86	79				
LCS 240-78499/4	Lab Control Sample	84	90	89	83				
LCS 240-78611/4	Lab Control Sample	81	89	88	82				
MB 240-78499/5	Method Blank	86	80	85	77				
MB 240-78611/5	Method Blank	89	85	87	83				

Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		FBP	2FP	TBP	NBZ	PHL	TPH		
Lab Sample ID	Client Sample ID	(20-110)	(10-110)	(21-110)	(21-110)	(21-110)	(24-110)		
240-21836-1	MW-6R-13	61	53	58	68	53	77		
240-21836-3	MW-1R-13	64	57	60	70	56	80		
240-21836-4	MW-11R-13	67	60	65	72	60	81		
240-21836-5	MW-3R-13	66	60	64	72	61	84		
LCS 240-78024/12-A	Lab Control Sample	71	61	61	76	61	78		
MB 240-78024/11-A	Method Blank	68	60	57	73	59	88		

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPH = Terphenyl-d14 (Surr)

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-78499/5
Matrix: Water
Analysis Batch: 78499

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			03/15/13 15:06	1
Benzene	0.13	U	1.0	0.13	ug/L			03/15/13 15:06	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			03/15/13 15:06	1
Bromoform	0.64	U	1.0	0.64	ug/L			03/15/13 15:06	1
Bromomethane	0.41	U	1.0	0.41	ug/L			03/15/13 15:06	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			03/15/13 15:06	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			03/15/13 15:06	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			03/15/13 15:06	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			03/15/13 15:06	1
Chloroethane	0.29	U	1.0	0.29	ug/L			03/15/13 15:06	1
Chloroform	0.16	U	1.0	0.16	ug/L			03/15/13 15:06	1
Chloromethane	0.30	U	1.0	0.30	ug/L			03/15/13 15:06	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			03/15/13 15:06	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			03/15/13 15:06	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			03/15/13 15:06	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			03/15/13 15:06	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			03/15/13 15:06	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			03/15/13 15:06	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			03/15/13 15:06	1
2-Hexanone	0.41	U	10	0.41	ug/L			03/15/13 15:06	1
Methylene Chloride	1.29	J	5.0	0.33	ug/L			03/15/13 15:06	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			03/15/13 15:06	1
Styrene	0.11	U	1.0	0.11	ug/L			03/15/13 15:06	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			03/15/13 15:06	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			03/15/13 15:06	1
Toluene	0.13	U	1.0	0.13	ug/L			03/15/13 15:06	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			03/15/13 15:06	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			03/15/13 15:06	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			03/15/13 15:06	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			03/15/13 15:06	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			03/15/13 15:06	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			03/15/13 15:06	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			03/15/13 15:06	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			03/15/13 15:06	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			03/15/13 15:06	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			03/15/13 15:06	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			03/15/13 15:06	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			03/15/13 15:06	1
Methyl acetate	0.38	U	10	0.38	ug/L			03/15/13 15:06	1
Methyl tert-butyl ether	0.17	U	1.0	0.17	ug/L			03/15/13 15:06	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			03/15/13 15:06	1
1,2,4-Trichlorobenzene	0.311	J	1.0	0.15	ug/L			03/15/13 15:06	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			03/15/13 15:06	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			03/15/13 15:06	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			03/15/13 15:06	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			03/15/13 15:06	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			03/15/13 15:06	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			03/15/13 15:06	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-78499/5
Matrix: Water
Analysis Batch: 78499

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		63 - 129		03/15/13 15:06	1
4-Bromofluorobenzene (Surr)	80		66 - 117		03/15/13 15:06	1
Toluene-d8 (Surr)	85		74 - 115		03/15/13 15:06	1
Dibromofluoromethane (Surr)	77		75 - 121		03/15/13 15:06	1

Lab Sample ID: LCS 240-78499/4
Matrix: Water
Analysis Batch: 78499

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	16.3		ug/L		81	43 - 136
Benzene	10.0	9.11		ug/L		91	83 - 112
Bromodichloromethane	10.0	8.73		ug/L		87	72 - 121
Bromoform	10.0	8.33		ug/L		83	40 - 131
Bromomethane	10.0	7.60		ug/L		76	11 - 185
2-Butanone (MEK)	20.0	17.4		ug/L		87	60 - 126
Carbon disulfide	10.0	8.03		ug/L		80	62 - 142
Carbon tetrachloride	10.0	7.96		ug/L		80	66 - 128
Chlorobenzene	10.0	9.27		ug/L		93	85 - 110
Chloroethane	10.0	6.87		ug/L		69	25 - 153
Chloroform	10.0	8.65		ug/L		87	79 - 117
Chloromethane	10.0	9.01		ug/L		90	44 - 126
1,1-Dichloroethane	10.0	8.65		ug/L		87	82 - 115
1,2-Dichloroethane	10.0	9.23		ug/L		92	71 - 127
1,1-Dichloroethene	10.0	9.16		ug/L		92	78 - 131
1,2-Dichloropropane	10.0	9.31		ug/L		93	81 - 115
cis-1,3-Dichloropropene	10.0	8.06		ug/L		81	61 - 115
trans-1,3-Dichloropropene	10.0	7.99		ug/L		80	58 - 117
Ethylbenzene	10.0	9.49		ug/L		95	83 - 112
2-Hexanone	20.0	19.4		ug/L		97	55 - 133
Methylene Chloride	10.0	9.16		ug/L		92	66 - 131
4-Methyl-2-pentanone (MIBK)	20.0	18.3		ug/L		91	63 - 128
Styrene	10.0	8.56		ug/L		86	79 - 114
1,1,2,2-Tetrachloroethane	10.0	8.99		ug/L		90	68 - 118
Tetrachloroethene	10.0	9.31		ug/L		93	79 - 114
Toluene	10.0	9.20		ug/L		92	84 - 111
Trichloroethene	10.0	9.41		ug/L		94	76 - 117
Vinyl chloride	10.0	8.10		ug/L		81	53 - 127
Xylenes, Total	30.0	28.5		ug/L		95	83 - 112
1,1,1-Trichloroethane	10.0	7.39		ug/L		74	74 - 118
1,1,2-Trichloroethane	10.0	9.56		ug/L		96	80 - 112
Cyclohexane	10.0	8.55		ug/L		86	54 - 121
1,2-Dibromo-3-Chloropropane	10.0	7.97		ug/L		80	42 - 136
1,2-Dibromoethane	10.0	9.24		ug/L		92	79 - 113
Dichlorodifluoromethane	10.0	12.5		ug/L		125	19 - 129
cis-1,2-Dichloroethene	10.0	8.78		ug/L		88	80 - 113
trans-1,2-Dichloroethene	10.0	8.57		ug/L		86	83 - 117
Isopropylbenzene	10.0	9.25		ug/L		93	75 - 114

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-78499/4
Matrix: Water
Analysis Batch: 78499

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methyl acetate	10.0	8.64	J	ug/L		86	58 - 131
Methyl tert-butyl ether	10.0	7.93		ug/L		79	52 - 144
1,1,2-Trichloro-1,2,2-trifluoroethane	10.0	13.0		ug/L		130	74 - 151
1,2,4-Trichlorobenzene	10.0	9.67		ug/L		97	48 - 135
1,2-Dichlorobenzene	10.0	9.71		ug/L		97	81 - 110
1,3-Dichlorobenzene	10.0	9.55		ug/L		96	80 - 110
1,4-Dichlorobenzene	10.0	9.29		ug/L		93	82 - 110
Trichlorofluoromethane	10.0	19.3	*	ug/L		193	49 - 157
Dibromochloromethane	10.0	8.78		ug/L		88	64 - 119
Methylcyclohexane	10.0	8.84		ug/L		88	56 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*63 - 129*
4-Bromofluorobenzene (Surr)	*90*		*66 - 117*
Toluene-d8 (Surr)	*89*		*74 - 115*
Dibromofluoromethane (Surr)	*83*		*75 - 121*

Lab Sample ID: MB 240-78611/5
Matrix: Water
Analysis Batch: 78611

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	1.1	U	10	1.1	ug/L			03/18/13 11:49	1
Benzene	0.13	U	1.0	0.13	ug/L			03/18/13 11:49	1
Bromodichloromethane	0.15	U	1.0	0.15	ug/L			03/18/13 11:49	1
Bromoform	0.64	U	1.0	0.64	ug/L			03/18/13 11:49	1
Bromomethane	0.41	U	1.0	0.41	ug/L			03/18/13 11:49	1
2-Butanone (MEK)	0.57	U	10	0.57	ug/L			03/18/13 11:49	1
Carbon disulfide	0.13	U	5.0	0.13	ug/L			03/18/13 11:49	1
Carbon tetrachloride	0.13	U	1.0	0.13	ug/L			03/18/13 11:49	1
Chlorobenzene	0.15	U	1.0	0.15	ug/L			03/18/13 11:49	1
Chloroethane	0.29	U	1.0	0.29	ug/L			03/18/13 11:49	1
Chloroform	0.16	U	1.0	0.16	ug/L			03/18/13 11:49	1
Chloromethane	0.30	U	1.0	0.30	ug/L			03/18/13 11:49	1
1,1-Dichloroethane	0.15	U	1.0	0.15	ug/L			03/18/13 11:49	1
1,2-Dichloroethane	0.22	U	1.0	0.22	ug/L			03/18/13 11:49	1
1,1-Dichloroethene	0.19	U	1.0	0.19	ug/L			03/18/13 11:49	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			03/18/13 11:49	1
cis-1,3-Dichloropropene	0.14	U	1.0	0.14	ug/L			03/18/13 11:49	1
trans-1,3-Dichloropropene	0.19	U	1.0	0.19	ug/L			03/18/13 11:49	1
Ethylbenzene	0.17	U	1.0	0.17	ug/L			03/18/13 11:49	1
2-Hexanone	0.41	U	10	0.41	ug/L			03/18/13 11:49	1
Methylene Chloride	0.528	J	5.0	0.33	ug/L			03/18/13 11:49	1
4-Methyl-2-pentanone (MIBK)	0.32	U	10	0.32	ug/L			03/18/13 11:49	1
Styrene	0.11	U	1.0	0.11	ug/L			03/18/13 11:49	1
1,1,2,2-Tetrachloroethane	0.18	U	1.0	0.18	ug/L			03/18/13 11:49	1
Tetrachloroethene	0.29	U	1.0	0.29	ug/L			03/18/13 11:49	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-78611/5
Matrix: Water
Analysis Batch: 78611

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	0.13	U	1.0	0.13	ug/L			03/18/13 11:49	1
Trichloroethene	0.17	U	1.0	0.17	ug/L			03/18/13 11:49	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			03/18/13 11:49	1
Xylenes, Total	0.28	U	2.0	0.28	ug/L			03/18/13 11:49	1
1,1,1-Trichloroethane	0.22	U	1.0	0.22	ug/L			03/18/13 11:49	1
1,1,2-Trichloroethane	0.27	U	1.0	0.27	ug/L			03/18/13 11:49	1
Cyclohexane	0.12	U	1.0	0.12	ug/L			03/18/13 11:49	1
1,2-Dibromo-3-Chloropropane	0.67	U	1.0	0.67	ug/L			03/18/13 11:49	1
1,2-Dibromoethane	0.24	U	1.0	0.24	ug/L			03/18/13 11:49	1
Dichlorodifluoromethane	0.31	U	1.0	0.31	ug/L			03/18/13 11:49	1
cis-1,2-Dichloroethene	0.17	U	1.0	0.17	ug/L			03/18/13 11:49	1
trans-1,2-Dichloroethene	0.19	U	1.0	0.19	ug/L			03/18/13 11:49	1
Isopropylbenzene	0.13	U	1.0	0.13	ug/L			03/18/13 11:49	1
Methyl acetate	0.38	U	10	0.38	ug/L			03/18/13 11:49	1
Methyl tert-butyl ether	0.17	U	1.0	0.17	ug/L			03/18/13 11:49	1
1,1,2-Trichloro-1,2,2-trifluoroethane	0.28	U	1.0	0.28	ug/L			03/18/13 11:49	1
1,2,4-Trichlorobenzene	0.306	J	1.0	0.15	ug/L			03/18/13 11:49	1
1,2-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			03/18/13 11:49	1
1,3-Dichlorobenzene	0.14	U	1.0	0.14	ug/L			03/18/13 11:49	1
1,4-Dichlorobenzene	0.13	U	1.0	0.13	ug/L			03/18/13 11:49	1
Trichlorofluoromethane	0.21	U	1.0	0.21	ug/L			03/18/13 11:49	1
Dibromochloromethane	0.18	U	1.0	0.18	ug/L			03/18/13 11:49	1
Methylcyclohexane	0.13	U	1.0	0.13	ug/L			03/18/13 11:49	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*63 - 129*		*03/18/13 11:49*	*1*
4-Bromofluorobenzene (Surr)	*85*		*66 - 117*		*03/18/13 11:49*	*1*
Toluene-d8 (Surr)	*87*		*74 - 115*		*03/18/13 11:49*	*1*
Dibromofluoromethane (Surr)	*83*		*75 - 121*		*03/18/13 11:49*	*1*

Lab Sample ID: LCS 240-78611/4
Matrix: Water
Analysis Batch: 78611

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	14.7		ug/L		74	43 - 136
Benzene	10.0	9.37		ug/L		94	83 - 112
Bromodichloromethane	10.0	9.61		ug/L		96	72 - 121
Bromoform	10.0	9.21		ug/L		92	40 - 131
Bromomethane	10.0	8.43		ug/L		84	11 - 185
2-Butanone (MEK)	20.0	16.9		ug/L		85	60 - 126
Carbon disulfide	10.0	9.11		ug/L		91	62 - 142
Carbon tetrachloride	10.0	8.59		ug/L		86	66 - 128
Chlorobenzene	10.0	9.81		ug/L		98	85 - 110
Chloroethane	10.0	7.55		ug/L		75	25 - 153
Chloroform	10.0	8.89		ug/L		89	79 - 117
Chloromethane	10.0	10.1		ug/L		101	44 - 126
1,1-Dichloroethane	10.0	8.97		ug/L		90	82 - 115

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-78611/4
Matrix: Water
Analysis Batch: 78611

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dichloroethane	10.0	9.38		ug/L		94	71 - 127
1,1-Dichloroethene	10.0	8.97		ug/L		90	78 - 131
1,2-Dichloropropane	10.0	9.83		ug/L		98	81 - 115
cis-1,3-Dichloropropene	10.0	8.73		ug/L		87	61 - 115
trans-1,3-Dichloropropene	10.0	8.31		ug/L		83	58 - 117
Ethylbenzene	10.0	9.75		ug/L		97	83 - 112
2-Hexanone	20.0	18.4		ug/L		92	55 - 133
Methylene Chloride	10.0	8.67		ug/L		87	66 - 131
4-Methyl-2-pentanone (MIBK)	20.0	18.5		ug/L		92	63 - 128
Styrene	10.0	8.95		ug/L		89	79 - 114
1,1,2,2-Tetrachloroethane	10.0	8.62		ug/L		86	68 - 118
Tetrachloroethene	10.0	9.62		ug/L		96	79 - 114
Toluene	10.0	9.31		ug/L		93	84 - 111
Trichloroethene	10.0	9.65		ug/L		97	76 - 117
Vinyl chloride	10.0	9.18		ug/L		92	53 - 127
Xylenes, Total	30.0	29.5		ug/L		98	83 - 112
1,1,1-Trichloroethane	10.0	8.14		ug/L		81	74 - 118
1,1,2-Trichloroethane	10.0	9.77		ug/L		98	80 - 112
Cyclohexane	10.0	8.63		ug/L		86	54 - 121
1,2-Dibromo-3-Chloropropane	10.0	8.41		ug/L		84	42 - 136
1,2-Dibromoethane	10.0	9.48		ug/L		95	79 - 113
Dichlorodifluoromethane	10.0	12.9		ug/L		129	19 - 129
cis-1,2-Dichloroethene	10.0	9.00		ug/L		90	80 - 113
trans-1,2-Dichloroethene	10.0	8.97		ug/L		90	83 - 117
Isopropylbenzene	10.0	9.44		ug/L		94	75 - 114
Methyl acetate	10.0	8.39	J	ug/L		84	58 - 131
Methyl tert-butyl ether	10.0	8.16		ug/L		82	52 - 144
1,1,2-Trichloro-1,2,2-trifluoroethane	10.0	12.1		ug/L		121	74 - 151
1,2,4-Trichlorobenzene	10.0	10.0		ug/L		100	48 - 135
1,2-Dichlorobenzene	10.0	9.93		ug/L		99	81 - 110
1,3-Dichlorobenzene	10.0	9.75		ug/L		97	80 - 110
1,4-Dichlorobenzene	10.0	9.70		ug/L		97	82 - 110
Trichlorofluoromethane	10.0	15.8	*	ug/L		158	49 - 157
Dibromochloromethane	10.0	9.50		ug/L		95	64 - 119
Methylcyclohexane	10.0	8.78		ug/L		88	56 - 127

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*63 - 129*
4-Bromofluorobenzene (Surr)	*89*		*66 - 117*
Toluene-d8 (Surr)	*88*		*74 - 115*
Dibromofluoromethane (Surr)	*82*		*75 - 121*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-21836-6 MS
Matrix: Water
Analysis Batch: 78611

Client Sample ID: MW-13-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	7.3	U	133	113		ug/L		85	33 - 145
Benzene	0.87	U	66.7	70.3		ug/L		105	72 - 121
Bromodichloromethane	1.0	U	66.7	70.0		ug/L		105	67 - 120
Bromoform	4.3	U	66.7	61.9		ug/L		93	32 - 128
Bromomethane	2.7	U	66.7	49.9		ug/L		75	10 - 186
2-Butanone (MEK)	3.8	U	133	125		ug/L		93	54 - 129
Carbon disulfide	0.87	U	66.7	63.6		ug/L		95	57 - 147
Carbon tetrachloride	1.6	J	66.7	63.6		ug/L		93	59 - 129
Chlorobenzene	1.0	U	66.7	69.3		ug/L		104	80 - 110
Chloroethane	1.9	U	66.7	52.7		ug/L		79	21 - 165
Chloroform	7.4		66.7	76.7		ug/L		104	76 - 118
Chloromethane	2.0	U	66.7	77.3		ug/L		116	33 - 132
1,1-Dichloroethane	1.0	U	66.7	65.8		ug/L		99	79 - 116
1,2-Dichloroethane	1.5	U	66.7	72.3		ug/L		108	68 - 129
1,1-Dichloroethene	1.3	U	66.7	65.8		ug/L		99	74 - 135
1,2-Dichloropropane	1.2	U	66.7	72.2		ug/L		108	78 - 115
cis-1,3-Dichloropropene	0.93	U	66.7	57.6		ug/L		86	51 - 110
trans-1,3-Dichloropropene	1.3	U	66.7	57.7		ug/L		86	46 - 116
Ethylbenzene	1.1	U	66.7	67.2		ug/L		101	75 - 116
2-Hexanone	2.7	U	133	133		ug/L		99	47 - 139
Methylene Chloride	3.5	J B	66.7	64.4		ug/L		91	63 - 128
4-Methyl-2-pentanone (MIBK)	2.1	U	133	124		ug/L		93	56 - 131
Styrene	0.73	U	66.7	64.2		ug/L		96	71 - 117
1,1,2,2-Tetrachloroethane	1.2	U	66.7	64.1		ug/L		96	63 - 122
Tetrachloroethene	1.9	U	66.7	66.4		ug/L		100	70 - 117
Toluene	0.87	U	66.7	68.4		ug/L		103	78 - 114
Trichloroethene	190		66.7	264		ug/L		108	66 - 120
Vinyl chloride	1.5	U	66.7	56.4		ug/L		85	49 - 130
Xylenes, Total	1.9	U	200	208		ug/L		104	76 - 116
1,1,1-Trichloroethane	8.3		66.7	65.7		ug/L		86	68 - 121
1,1,2-Trichloroethane	1.8	U	66.7	73.0		ug/L		110	75 - 115
Cyclohexane	0.80	U	66.7	52.2		ug/L		78	49 - 123
1,2-Dibromo-3-Chloropropane	4.5	U	66.7	56.3		ug/L		84	32 - 139
1,2-Dibromoethane	1.6	U	66.7	68.0		ug/L		102	74 - 113
Dichlorodifluoromethane	2.1	U	66.7	80.4		ug/L		121	17 - 128
cis-1,2-Dichloroethene	1.1	U	66.7	65.2		ug/L		98	70 - 120
trans-1,2-Dichloroethene	1.3	U	66.7	64.9		ug/L		97	80 - 119
Isopropylbenzene	0.87	U	66.7	63.9		ug/L		96	68 - 116
Methyl acetate	2.5	U	66.7	60.8	J	ug/L		91	47 - 130
Methyl tert-butyl ether	1.1	U	66.7	55.3		ug/L		83	46 - 144
1,1,2-Trichloro-1,2,2-trifluoroethane	1.9	U	66.7	78.4		ug/L		118	70 - 152
1,2,4-Trichlorobenzene	1.0	U	66.7	64.3		ug/L		96	38 - 138
1,2-Dichlorobenzene	0.87	U	66.7	69.3		ug/L		104	75 - 111
1,3-Dichlorobenzene	0.93	U	66.7	67.4		ug/L		101	73 - 110
1,4-Dichlorobenzene	0.87	U	66.7	65.3		ug/L		98	75 - 110
Trichlorofluoromethane	1.4	U *	66.7	126	F	ug/L		190	46 - 157
Dibromochloromethane	1.2	U	66.7	65.2		ug/L		98	56 - 118

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-21836-6 MS
Matrix: Water
Analysis Batch: 78611

Client Sample ID: MW-13-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Methylcyclohexane	0.87	U	66.7	51.3		ug/L		77	49 - 127

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*63 - 129*
4-Bromofluorobenzene (Surr)	*94*		*66 - 117*
Toluene-d8 (Surr)	*93*		*74 - 115*
Dibromofluoromethane (Surr)	*88*		*75 - 121*

Lab Sample ID: 240-21836-6 MSD
Matrix: Water
Analysis Batch: 78611

Client Sample ID: MW-13-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	7.3	U	133	107		ug/L		80	33 - 145	5	30
Benzene	0.87	U	66.7	68.8		ug/L		103	72 - 121	2	30
Bromodichloromethane	1.0	U	66.7	67.5		ug/L		101	67 - 120	4	30
Bromoform	4.3	U	66.7	60.1		ug/L		90	32 - 128	3	30
Bromomethane	2.7	U	66.7	48.8		ug/L		73	10 - 186	2	30
2-Butanone (MEK)	3.8	U	133	123		ug/L		92	54 - 129	1	30
Carbon disulfide	0.87	U	66.7	62.3		ug/L		93	57 - 147	2	30
Carbon tetrachloride	1.6	J	66.7	57.3		ug/L		84	59 - 129	10	30
Chlorobenzene	1.0	U	66.7	67.0		ug/L		100	80 - 110	3	30
Chloroethane	1.9	U	66.7	47.0		ug/L		70	21 - 165	11	30
Chloroform	7.4		66.7	73.3		ug/L		99	76 - 118	5	30
Chloromethane	2.0	U	66.7	75.7		ug/L		114	33 - 132	2	30
1,1-Dichloroethane	1.0	U	66.7	64.2		ug/L		96	79 - 116	2	30
1,2-Dichloroethane	1.5	U	66.7	70.5		ug/L		106	68 - 129	3	30
1,1-Dichloroethene	1.3	U	66.7	65.4		ug/L		98	74 - 135	1	30
1,2-Dichloropropane	1.2	U	66.7	70.5		ug/L		106	78 - 115	2	30
cis-1,3-Dichloropropene	0.93	U	66.7	57.5		ug/L		86	51 - 110	0	30
trans-1,3-Dichloropropene	1.3	U	66.7	56.1		ug/L		84	46 - 116	3	30
Ethylbenzene	1.1	U	66.7	66.9		ug/L		100	75 - 116	1	30
2-Hexanone	2.7	U	133	133		ug/L		100	47 - 139	0	30
Methylene Chloride	3.5	J B	66.7	62.8		ug/L		89	63 - 128	2	30
4-Methyl-2-pentanone (MIBK)	2.1	U	133	124		ug/L		93	56 - 131	0	30
Styrene	0.73	U	66.7	63.2		ug/L		95	71 - 117	2	30
1,1,2,2-Tetrachloroethane	1.2	U	66.7	62.3		ug/L		93	63 - 122	3	30
Tetrachloroethene	1.9	U	66.7	65.8		ug/L		99	70 - 117	1	30
Toluene	0.87	U	66.7	65.7		ug/L		98	78 - 114	4	30
Trichloroethene	190		66.7	248		ug/L		84	66 - 120	6	30
Vinyl chloride	1.5	U	66.7	59.7		ug/L		90	49 - 130	6	30
Xylenes, Total	1.9	U	200	204		ug/L		102	76 - 116	2	30
1,1,1-Trichloroethane	8.3		66.7	62.8		ug/L		82	68 - 121	5	30
1,1,2-Trichloroethane	1.8	U	66.7	70.2		ug/L		105	75 - 115	4	30
Cyclohexane	0.80	U	66.7	52.7		ug/L		79	49 - 123	1	30
1,2-Dibromo-3-Chloropropane	4.5	U	66.7	55.2		ug/L		83	32 - 139	2	30
1,2-Dibromoethane	1.6	U	66.7	65.0		ug/L		97	74 - 113	5	30
Dichlorodifluoromethane	2.1	U	66.7	81.0		ug/L		121	17 - 128	1	30

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-21836-6 MSD
Matrix: Water
Analysis Batch: 78611

Client Sample ID: MW-13-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	1.1	U	66.7	64.1		ug/L		96	70 - 120	2	30
trans-1,2-Dichloroethene	1.3	U	66.7	63.3		ug/L		95	80 - 119	3	30
Isopropylbenzene	0.87	U	66.7	63.6		ug/L		95	68 - 116	1	30
Methyl acetate	2.5	U	66.7	60.7	J	ug/L		91	47 - 130	0	30
Methyl tert-butyl ether	1.1	U	66.7	55.3		ug/L		83	46 - 144	0	30
1,1,2-Trichloro-1,2,2-trifluoroethane	1.9	U	66.7	75.5		ug/L		113	70 - 152	4	30
1,2,4-Trichlorobenzene	1.0	U	66.7	64.0		ug/L		96	38 - 138	0	30
1,2-Dichlorobenzene	0.87	U	66.7	68.5		ug/L		103	75 - 111	1	30
1,3-Dichlorobenzene	0.93	U	66.7	65.9		ug/L		99	73 - 110	2	30
1,4-Dichlorobenzene	0.87	U	66.7	64.5		ug/L		97	75 - 110	1	30
Trichlorofluoromethane	1.4	U *	66.7	121	F	ug/L		182	46 - 157	4	30
Dibromochloromethane	1.2	U	66.7	62.1		ug/L		93	56 - 118	5	30
Methylcyclohexane	0.87	U	66.7	51.2		ug/L		77	49 - 127	0	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*63 - 129*
4-Bromofluorobenzene (Surr)	*90*		*66 - 117*
Toluene-d8 (Surr)	*88*		*74 - 115*
Dibromofluoromethane (Surr)	*83*		*75 - 121*

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-78024/11-A
Matrix: Water
Analysis Batch: 78251

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 78024

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	0.10	U	1.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Benzo[a]pyrene	0.10	U	1.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Benzo[b]fluoranthene	0.10	U	1.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Benzo[g,h,i]perylene	0.10	U	1.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Benzo[k]fluoranthene	0.10	U	1.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Anthracene	0.10	U	5.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Chrysene	0.10	U	1.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Dibenz(a,h)anthracene	0.10	U	2.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Fluoranthene	0.10	U	1.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Fluorene	0.10	U	5.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Indeno[1,2,3-cd]pyrene	0.10	U	2.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Phenanthrene	0.10	U	2.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Pyrene	0.10	U	5.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Acenaphthene	0.10	U	5.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Acenaphthylene	0.10	U	5.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
Naphthalene	0.10	U	5.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1
2-Methylnaphthalene	0.10	U	5.0	0.10	ug/L		03/12/13 11:22	03/14/13 09:20	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-78024/11-A
Matrix: Water
Analysis Batch: 78251

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 78024

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	68		20 - 110	03/12/13 11:22	03/14/13 09:20	1
2-Fluorophenol (Surr)	60		10 - 110	03/12/13 11:22	03/14/13 09:20	1
2,4,6-Tribromophenol (Surr)	57		21 - 110	03/12/13 11:22	03/14/13 09:20	1
Nitrobenzene-d5 (Surr)	73		21 - 110	03/12/13 11:22	03/14/13 09:20	1
Phenol-d5 (Surr)	59		21 - 110	03/12/13 11:22	03/14/13 09:20	1
Terphenyl-d14 (Surr)	88		24 - 110	03/12/13 11:22	03/14/13 09:20	1

Lab Sample ID: LCS 240-78024/12-A
Matrix: Water
Analysis Batch: 78251

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 78024

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzo[a]anthracene	20.0	16.2		ug/L		81	52 - 110
Benzo[a]pyrene	20.0	13.3		ug/L		67	44 - 110
Benzo[b]fluoranthene	20.0	15.5		ug/L		78	48 - 110
Benzo[g,h,i]perylene	20.0	15.5		ug/L		77	50 - 110
Benzo[k]fluoranthene	20.0	15.8		ug/L		79	49 - 110
Anthracene	20.0	17.5		ug/L		87	52 - 110
Chrysene	20.0	17.2		ug/L		86	55 - 110
Dibenz(a,h)anthracene	20.0	15.3		ug/L		76	49 - 110
Fluoranthene	20.0	17.9		ug/L		89	54 - 110
Fluorene	20.0	17.5		ug/L		87	52 - 110
Indeno[1,2,3-cd]pyrene	20.0	14.7		ug/L		73	50 - 110
Phenanthrene	20.0	16.7		ug/L		83	53 - 110
Pyrene	20.0	17.0		ug/L		85	52 - 110
Acenaphthene	20.0	16.5		ug/L		82	47 - 110
Acenaphthylene	20.0	17.4		ug/L		87	49 - 110
Naphthalene	20.0	16.1		ug/L		80	44 - 110
2-Methylnaphthalene	20.0	16.8		ug/L		84	45 - 110

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	71		20 - 110
2-Fluorophenol (Surr)	61		10 - 110
2,4,6-Tribromophenol (Surr)	61		21 - 110
Nitrobenzene-d5 (Surr)	76		21 - 110
Phenol-d5 (Surr)	61		21 - 110
Terphenyl-d14 (Surr)	78		24 - 110

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 180-66191/1-A
Matrix: Water
Analysis Batch: 66495

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 66191

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.036	U	1.0	0.036	ug/L		03/13/13 14:07	03/16/13 19:31	1
Silver	0.036	U	1.0	0.036	ug/L		03/13/13 14:07	03/16/13 19:31	1

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 180-66191/1-A
Matrix: Water
Analysis Batch: 66495

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 66191

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.29	U	1.0	0.29	ug/L		03/13/13 14:07	03/16/13 19:31	1
Arsenic	0.29	U	1.0	0.29	ug/L		03/13/13 14:07	03/16/13 19:31	1
Barium	0.098	U	10	0.098	ug/L		03/13/13 14:07	03/16/13 19:31	1
Barium	0.098	U	10	0.098	ug/L		03/13/13 14:07	03/16/13 19:31	1
Cadmium	0.11	U	1.0	0.11	ug/L		03/13/13 14:07	03/16/13 19:31	1
Chromium	0.54	U	2.0	0.54	ug/L		03/13/13 14:07	03/16/13 19:31	1
Chromium	0.54	U	2.0	0.54	ug/L		03/13/13 14:07	03/16/13 19:31	1
Sodium	3.8	U	100	3.8	ug/L		03/13/13 14:07	03/16/13 19:31	1
Sodium	3.8	U	100	3.8	ug/L		03/13/13 14:07	03/16/13 19:31	1
Nickel	0.17	U	1.0	0.17	ug/L		03/13/13 14:07	03/16/13 19:31	1
Nickel	0.17	U	1.0	0.17	ug/L		03/13/13 14:07	03/16/13 19:31	1
Lead	0.0200	J	1.0	0.019	ug/L		03/13/13 14:07	03/16/13 19:31	1
Lead	0.0200	J	1.0	0.019	ug/L		03/13/13 14:07	03/16/13 19:31	1
Selenium	0.42	U	5.0	0.42	ug/L		03/13/13 14:07	03/16/13 19:31	1
Selenium	0.42	U	5.0	0.42	ug/L		03/13/13 14:07	03/16/13 19:31	1
Zinc	0.96	U	5.0	0.96	ug/L		03/13/13 14:07	03/16/13 19:31	1
Zinc	0.96	U	5.0	0.96	ug/L		03/13/13 14:07	03/16/13 19:31	1

Lab Sample ID: LCS 180-66191/2-A
Matrix: Water
Analysis Batch: 66495

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 66191

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	50.0	49.5		ug/L		99	80 - 120
Silver	50.0	49.5		ug/L		99	80 - 120
Arsenic	40.0	36.5		ug/L		91	80 - 120
Arsenic	40.0	36.5		ug/L		91	80 - 120
Barium	2000	1990		ug/L		99	80 - 120
Barium	2000	1990		ug/L		99	80 - 120
Cadmium	50.0	51.4		ug/L		103	80 - 120
Chromium	200	189		ug/L		95	80 - 120
Chromium	200	189		ug/L		95	80 - 120
Sodium	50000	46800		ug/L		94	80 - 120
Sodium	50000	46800		ug/L		94	80 - 120
Nickel	500	491		ug/L		98	80 - 120
Nickel	500	491		ug/L		98	80 - 120
Lead	20.0	18.3		ug/L		91	80 - 120
Lead	20.0	18.3		ug/L		91	80 - 120
Selenium	10.0	9.86		ug/L		99	80 - 120
Selenium	10.0	9.86		ug/L		99	80 - 120
Zinc	500	497		ug/L		99	80 - 120
Zinc	500	497		ug/L		99	80 - 120

Lab Sample ID: LCSD 180-66191/13-A
Matrix: Water
Analysis Batch: 66495

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 66191

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silver	50.0	47.6		ug/L		95	80 - 120	4	20

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 180-66191/13-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 66973 — **Prep Batch: 66191**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silver			50.0	47.6		ug/L		95	80 - 120	4	20
Arsenic			40.0	36.6		ug/L		91	80 - 120	0	20
Arsenic			40.0	36.6		ug/L		91	80 - 120	0	20
Barium			2000	2040		ug/L		102	80 - 120	3	20
Barium			2000	2040		ug/L		102	80 - 120	3	20
Cadmium			50.0	50.8		ug/L		102	80 - 120	1	20
Chromium			200	188		ug/L		94	80 - 120	1	20
Chromium			200	188		ug/L		94	80 - 120	1	20
Sodium			50000	46500		ug/L		93	80 - 120	1	20
Sodium			50000	46500		ug/L		93	80 - 120	1	20
Nickel			500	488		ug/L		98	80 - 120	1	20
Nickel			500	488		ug/L		98	80 - 120	1	20
Lead			20.0	18.4		ug/L		92	80 - 120	1	20
Lead			20.0	18.4		ug/L		92	80 - 120	1	20
Selenium			10.0	9.52		ug/L		95	80 - 120	4	20
Selenium			10.0	9.52		ug/L		95	80 - 120	4	20
Zinc			500	494		ug/L		99	80 - 120	1	20
Zinc			500	494		ug/L		99	80 - 120	1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-66148/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 66203 — **Prep Batch: 66148**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038	U	0.20	0.038	ug/L		03/13/13 09:51	03/13/13 13:41	1

Lab Sample ID: LCS 180-66148/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 66203 — **Prep Batch: 66148**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Mercury			2.50	2.51		ug/L		100	80 - 120		

Lab Sample ID: 240-21836-2 MS — **Client Sample ID: MW-8**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 66203 — **Prep Batch: 66148**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Mercury	0.038	U	1.00	1.01		ug/L		101	75 - 125		

Lab Sample ID: 240-21836-2 MSD — **Client Sample ID: MW-8**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 66203 — **Prep Batch: 66148**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.038	U	1.00	1.05		ug/L		105	75 - 125	4	20

GC/MS VOA

Analysis Batch: 78499

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21836-1	MW-6R-13	Total/NA	Water	8260B	
240-21836-4	MW-11R-13	Total/NA	Water	8260B	
240-21836-5	MW-3R-13	Total/NA	Water	8260B	
240-21836-7	TRIP BLANK	Total/NA	Water	8260B	
LCS 240-78499/4	Lab Control Sample	Total/NA	Water	8260B	
MB 240-78499/5	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 78611

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21836-3	MW-1R-13	Total/NA	Water	8260B	
240-21836-6	MW-13-13	Total/NA	Water	8260B	
240-21836-6 MS	MW-13-13	Total/NA	Water	8260B	
240-21836-6 MSD	MW-13-13	Total/NA	Water	8260B	
LCS 240-78611/4	Lab Control Sample	Total/NA	Water	8260B	
MB 240-78611/5	Method Blank	Total/NA	Water	8260B	

GC/MS Semi VOA

Prep Batch: 78024

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21836-1	MW-6R-13	Total/NA	Water	3520C	
240-21836-3	MW-1R-13	Total/NA	Water	3520C	
240-21836-4	MW-11R-13	Total/NA	Water	3520C	
240-21836-5	MW-3R-13	Total/NA	Water	3520C	
LCS 240-78024/12-A	Lab Control Sample	Total/NA	Water	3520C	
MB 240-78024/11-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 78251

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21836-1	MW-6R-13	Total/NA	Water	8270C	78024
240-21836-3	MW-1R-13	Total/NA	Water	8270C	78024
240-21836-4	MW-11R-13	Total/NA	Water	8270C	78024
240-21836-5	MW-3R-13	Total/NA	Water	8270C	78024
LCS 240-78024/12-A	Lab Control Sample	Total/NA	Water	8270C	78024
MB 240-78024/11-A	Method Blank	Total/NA	Water	8270C	78024

Metals

Prep Batch: 66148

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21836-1	MW-6R-13	Dissolved	Water	7470A	
240-21836-2	MW-8	Dissolved	Water	7470A	
240-21836-2 MS	MW-8	Dissolved	Water	7470A	
240-21836-2 MSD	MW-8	Dissolved	Water	7470A	
LCS 180-66148/2-A	Lab Control Sample	Total/NA	Water	7470A	
MB 180-66148/1-A	Method Blank	Total/NA	Water	7470A	

Prep Batch: 66191

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21836-1	MW-6R-13	Dissolved	Water	3005A	

Metals (Continued)

Prep Batch: 66191 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-66191/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 180-66191/13-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 180-66191/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 66203

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21836-1	MW-6R-13	Dissolved	Water	7470A	66148
240-21836-2	MW-8	Dissolved	Water	7470A	66148
240-21836-2 MS	MW-8	Dissolved	Water	7470A	66148
240-21836-2 MSD	MW-8	Dissolved	Water	7470A	66148
LCS 180-66148/2-A	Lab Control Sample	Total/NA	Water	7470A	66148
MB 180-66148/1-A	Method Blank	Total/NA	Water	7470A	66148

Analysis Batch: 66495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21836-1	MW-6R-13	Dissolved	Water	6020	66191
LCS 180-66191/2-A	Lab Control Sample	Total Recoverable	Water	6020	66191
LCSD 180-66191/13-A	Lab Control Sample Dup	Total Recoverable	Water	6020	66191
MB 180-66191/1-A	Method Blank	Total Recoverable	Water	6020	66191

Analysis Batch: 66973

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-21836-1	MW-6R-13	Dissolved	Water	6020	66191
LCS 180-66191/2-A	Lab Control Sample	Total Recoverable	Water	6020	66191
LCSD 180-66191/13-A	Lab Control Sample Dup	Total Recoverable	Water	6020	66191
MB 180-66191/1-A	Method Blank	Total Recoverable	Water	6020	66191

Lab Chronicle

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-6R-13

Lab Sample ID: 240-21836-1

Date Collected: 03/07/13 10:45

Matrix: Water

Date Received: 03/09/13 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1.43	78499	03/15/13 20:36	LW	TAL NC
Total/NA	Prep	3520C			78024	03/12/13 11:22	JS	TAL NC
Total/NA	Analysis	8270C		1	78251	03/14/13 11:30	TH	TAL NC
Dissolved	Prep	7470A			66148	03/13/13 09:51	JS	TAL PIT
Dissolved	Analysis	7470A		1	66203	03/13/13 14:00	JS	TAL PIT
Dissolved	Prep	3005A			66191	03/13/13 14:07	CH	TAL PIT
Dissolved	Analysis	6020		1	66495	03/16/13 20:33	BR	TAL PIT
Dissolved	Analysis	6020		1	66973	03/16/13 20:33	BR	TAL PIT

Client Sample ID: MW-8

Lab Sample ID: 240-21836-2

Date Collected: 03/07/13 11:18

Matrix: Water

Date Received: 03/09/13 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	7470A			66148	03/13/13 09:51	JS	TAL PIT
Dissolved	Analysis	7470A		1	66203	03/13/13 14:05	JS	TAL PIT

Client Sample ID: MW-1R-13

Lab Sample ID: 240-21836-3

Date Collected: 03/07/13 11:56

Matrix: Water

Date Received: 03/09/13 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		5	78611	03/18/13 12:53	LW	TAL NC
Total/NA	Prep	3520C			78024	03/12/13 11:22	JS	TAL NC
Total/NA	Analysis	8270C		1	78251	03/14/13 11:52	TH	TAL NC

Client Sample ID: MW-11R-13

Lab Sample ID: 240-21836-4

Date Collected: 03/07/13 12:55

Matrix: Water

Date Received: 03/09/13 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		12.5	78499	03/15/13 21:22	LW	TAL NC
Total/NA	Prep	3520C			78024	03/12/13 11:22	JS	TAL NC
Total/NA	Analysis	8270C		1	78251	03/14/13 12:14	TH	TAL NC

Client Sample ID: MW-3R-13

Lab Sample ID: 240-21836-5

Date Collected: 03/07/13 14:15

Matrix: Water

Date Received: 03/09/13 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	78499	03/15/13 21:45	LW	TAL NC
Total/NA	Prep	3520C			78024	03/12/13 11:22	JS	TAL NC

Lab Chronicle

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Client Sample ID: MW-3R-13

Lab Sample ID: 240-21836-5

Date Collected: 03/07/13 14:15
Matrix: Water
Date Received: 03/09/13 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8270C		1	78251	03/14/13 12:35	TH	TAL NC

Client Sample ID: MW-13-13

Lab Sample ID: 240-21836-6

Date Collected: 03/07/13 14:56
Matrix: Water
Date Received: 03/09/13 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		6.67	78611	03/18/13 12:30	LW	TAL NC

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-21836-7

Date Collected: 03/07/13 00:00
Matrix: Water
Date Received: 03/09/13 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	78499	03/15/13 22:30	LW	TAL NC

Laboratory References:

TAL NC = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Certification Summary

Client: Tetra Tech GEO
Project/Site: 415 West Washington - 117-1054011.02

TestAmerica Job ID: 240-21836-1

Laboratory: TestAmerica Canton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-13
Connecticut	State Program	1	PH-0590	12-31-13
Florida	NELAP	4	E87225	06-30-13
Georgia	State Program	4	N/A	06-30-13
Illinois	NELAP	5	200004	07-31-13
Kansas	NELAP	7	E-10336	01-31-14
Kentucky	State Program	4	58	06-30-13
L-A-B	DoD ELAP		L2315	07-28-13
Minnesota	NELAP	5	039-999-348	12-31-13
Nevada	State Program	9	OH-000482008A	07-31-13
New Jersey	NELAP	2	OH001	06-30-13
New York	NELAP	2	10975	04-01-13
Ohio VAP	State Program	5	CL0024	01-19-14
Pennsylvania	NELAP	3	68-00340	08-31-13
Texas	NELAP	6		08-03-13
USDA	Federal		P330-11-00328	08-26-14
Virginia	NELAP	3	460175	09-14-13
Washington	State Program	10	C971	01-12-14
West Virginia DEP	State Program	3	210	12-31-13
Wisconsin	State Program	5	999518190	08-31-13

Laboratory: TestAmerica Pittsburgh

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-13
California	NELAP	9	4224CA	03-31-13
Connecticut	State Program	1	PH-0688	09-30-14
Florida	NELAP	4	E871008	06-30-13
Illinois	NELAP	5	002602	06-30-13
L-A-B	DoD ELAP		L2314	07-24-13
Louisiana	NELAP	6	04041	06-30-13
New Hampshire	NELAP	1	203011	04-04-13
New Jersey	NELAP	2	PA005	06-30-13
New York	NELAP	2	11182	04-01-13
North Carolina DENR	State Program	4	434	12-31-13
Pennsylvania	NELAP	3	02-00416	04-30-13
South Carolina	State Program	4	89014	04-30-13
US Fish & Wildlife	Federal		LE94312A-1	11-30-14
USDA	Federal		P-Soil-01	04-16-15
USDA	Federal		P330-10-00139	04-28-13
Utah	NELAP	8	STLP	04-30-13
Virginia	NELAP	3	460189	09-14-13
West Virginia DEP	State Program	3	142	01-31-14
Wisconsin	State Program	5	998027800	08-31-13

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: _____
Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other _____

TestAmerica Laboratories, Inc.

Client Contact				
Company Name: TetraTech	Client Project Manager: Patti McCall	Site Contact: Patti McCall	Lab Contact: Kris Brooks	COC No: 054814
Address: 710 Avis Dr	Telephone: 734-213-4069	Telephone: 734-213-4069	Telephone: 330-966-9790	1 of 1 COCs
City/State/Zip: Ann Arbor, MI 48108	Email: Patti.McCall@TetraTech.com	Analysis Turnaround Time (in BUS days)	Analyses	For lab use only
Phone: 734-213-2204	Method of Shipment/Carrier: LAB Courier Pickup	TAT if different from below STANDARD ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client ☐ Lab pickup ☐ Lab sampling ☐
Project Name: 415 West Washington	Shipping/Tracking No:			Job/SDG No:
Project Number: 117-10540 11.02				
PO #				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite C / Grab G	PNAs	VOCs	Metals (Dissolved)	Metal (Mercury) (Dissolved)	Sample Specific Notes / Special Instructions:
MW-6R-13	3.7.13	1045		X					1	3			2		Y	G	X	X	X		* Dissolved
MW-8	3.7.13	1118		X					1						Y	G				X	Metals Field
MW-1R-13	3.7.13	1156		X						3			2			G	X	X			Filtered:
MW-11R-13	3.7.13	1255		X						3			2			G	X	X			
MW-3R-13	3.7.13	1415		X						3			2			G	X	X			Metals =
MW-13-13	3.7.13	1456		X						3						G		X			Michigan 10
Trip Blank	3.7.13	—		X						1						G		X			And Mercury
																					MW-8 Mercury
																					only (Dissolved)

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal (A fee may be assessed)
☐ Return to Client ☒ Disp

hs

240-21836 Chain of Custody

Special Instructions/QC Requirements & Comments:

Sampler(s): Craig W. Decky, Anthony Sautter

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	TT	3.7.13 / 1620	Cold Storage	TT	3.7.13 / 1620
Cold Storage	TT	3/8/13 / 8:45	Patti McCall	TT	3/8/13 8:45
[illegible]	TEST AMERICA	3/8/13 8:45	Received in Laboratory by: [illegible]	TA	3/8/13 930

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TAL 0018- 1 (04/10)

TestAmerica Canton Sample Receipt Form/Narrative Login # : 21836

Client Tetra Tech Site Name _____ By: Derek O. Green

Cooler Received on 3-9-13 Opened on 3-9-13 (Signature)

FedEx: 1st Grd ~~Exp~~ UPS FAS Stetson Client Drop Off TestAmerica Courier Other _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt

IR GUN# 1	(CF –2 °C)	Observed Sample Temp._____°C	Corrected Sample Temp._____°C	☑ Multiple on Back
IR GUN# 4G	(CF 0 °C)	Observed Sample Temp._____°C	Corrected Sample Temp._____°C	
IR GUN# 5G	(CF 0 °C)	Observed Sample Temp._____°C	Corrected Sample Temp._____°C	
IR GUN# 8	(CF 0 °C)	Observed Sample Temp._____°C	Corrected Sample Temp._____°C	

2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
   -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were custody seals on the bottle(s)? Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Did all bottles arrive in good condition (Unbroken)? Yes No
7. Could all bottle labels be reconciled with the COC? Yes No
8. Were correct bottle(s) used for the test(s) indicated? Yes No
9. Sufficient quantity received to perform indicated analyses? Yes No
10. Were sample(s) at the correct pH upon receipt? 3-9-13 Yes No NA
11. Were VOAs on the COC? Yes No
12. Were air bubbles >6 mm in any VOA vials? Yes No NA
13. Was a trip blank present in the cooler(s)? Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

15. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

16. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in Sample Receiving to meet recommended pH level(s). Nitric Acid Lot# 031512-HNO3; Sulfuric Acid Lot# 051012-H2SO4; Sodium Hydroxide Lot# 121809 -NaOH; Hydrochloric Acid Lot# 041911-HCl; Sodium Hydroxide and Zinc Acetate Lot# 100108-(CH3COO)2ZN/NaOH. What time was preservative added to sample(s)? _____

Client ID	pH	Date	Initials

Cooler #	Observed Sample Temp. °C	Corrected Sample Temp. °C	IR #	Coolant
Client Cooler	2.6 2.4	2.6 2.4	46 1	ICE 1

Login Sample Receipt Checklist

Client: Tetra Tech GEO

Job Number: 240-21836-1

Login Number: 21836
List Number: 1
Creator: Ras, Erin F

List Source: TestAmerica Pittsburgh
List Creation: 03/12/13 10:04 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

STRUCTURAL EVALUATION REPORT

Chimney at 415 W. Washington Ann Arbor, Michigan

Submitted to:

DiClemente Siegel Design Inc.
28105 Greenfield Road
Southfield, MI 48076
Phone: (248) 569-1430

Submitted by:

Desai/Nasr Consulting Engineers, Inc.
6765 Daly Rd
West Bloomfield, Michigan 48322
Phone: 248-932-2010
Fax: 248-932-3088
www.desainasr.com

DNCE Project No. : 18-1339

Date Submitted: November 20, 2018

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1.0 EXECUTIVE SUMMARY

DiClemente Siegel Design Inc. authorized Desai/Nasr Consulting Engineers to perform an evaluation of the chimney connected to the building located at 415 W. Washington St, Ann Arbor, MI 48103.

A two-story building at the address indicated above has been vacant for several years and is planned to be fully demolished. A chimney is connected to the south face of the building (at the east side) with a concrete beam acting as a flue. As desired by the owner, the chimney is proposed to remain after the demolition of the adjacent building.

Original Construction Drawings were not available at the time of the condition assessment; therefore, the findings of this report are based on visual inspection of exposed structural elements and experience with buildings of similar construction and era. No destructive or non-destructive testing was performed. As such, although this condition assessment is useful for detecting gross issues, it may not detect every issue, especially subtle or hidden conditions.

Buried elements such as foundations were observed to the extents possible, but with limited results due to the visual nature of the inspection.

2.0 INTRODUCTION

A walk-through style visual inspection of the above captioned property was conducted on Thursday, November 1st, 2018 by Alaa Chehab of Desai/Nasr Consulting Engineers, Inc., and Doug Forsyth of the City of Ann Arbor. The walk-through inspection was limited to observation of elements that were readily accessible and visible. The inspection was limited to the exterior of the chimney and to the inside of the adjacent building to check how the concrete flue is attached to the building frame from the inside. Based on the observations and pictures taken (see APPENDIX A) during the site visit, conclusions and recommendations are made and presented in section 6.0 of the present report.

3.0 GENERAL DESCRIPTION

The chimney is approximately 48 ft tall with plan dimensions of approximately 5.5 ft x 5.5 ft, constructed from clay bricks and supported on a reinforced concrete base (Figure 1). The concrete base of the chimney is connected to the adjacent building through a concrete beam that is approximately 6 ft long, 2.75 ft x 2.75 ft in section, and 8 ft above ground level. There is also a 7 ft high masonry wall connecting the chimney (at the north-west corner) to the adjacent building wall (Photoset 3). Due to the lack of Existing Structural Drawings and the visual nature of the inspection, the chimney foundation layout is assumed to be isolated from the adjacent building foundation.

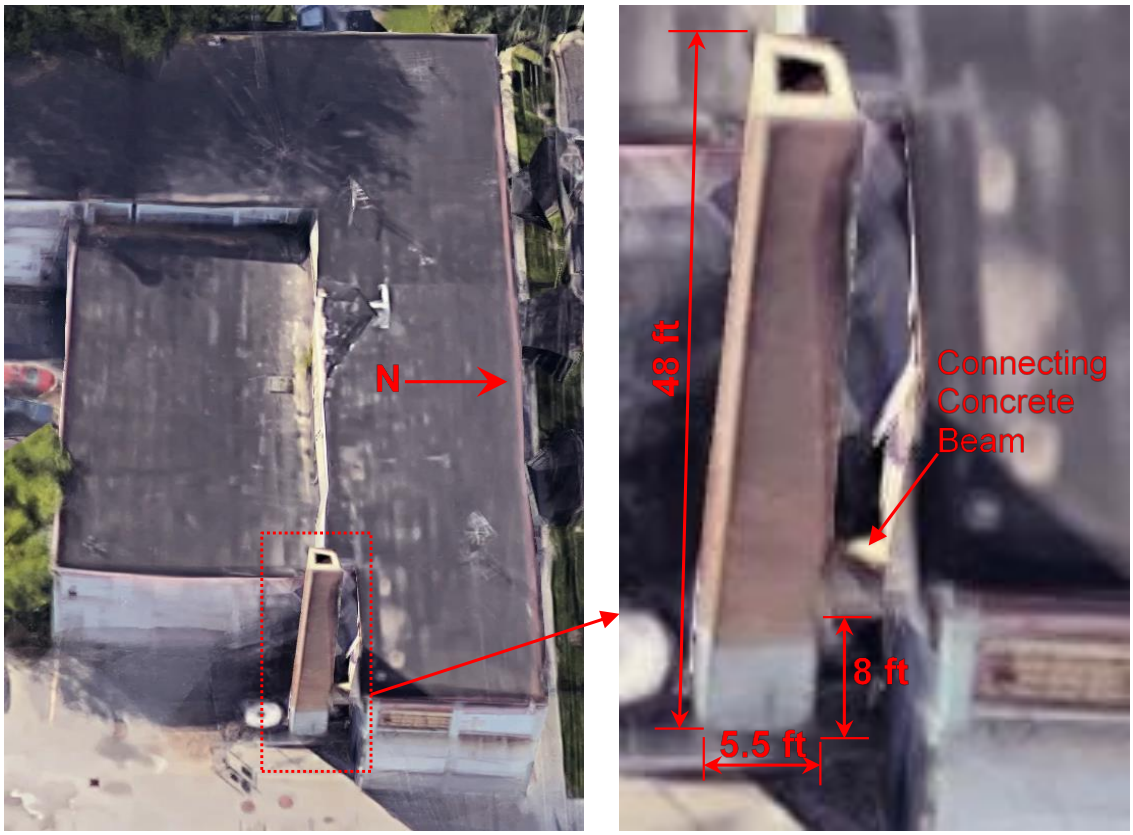


Figure 1. Chimney configuration and attachment to adjacent building.

4.0 CONDITION ASSESSMENT – CHIMNEY EXTERIOR

Based on the visual inspection of the chimney exterior and the attached flue, deteriorations in brick and concrete were observed. Photos of areas where deteriorations were found are provided in APPENDIX A of this report, and summarized as follows:

- Loose bricks and lack of mortar between bricks at top of chimney (Photoset 1).
- The concrete base of the chimney has vertical cracks at the south side, east and west sides (Photoset 2).
- Major crack in bricks extending from the west to the south side of the chimney, above the concrete base (Photoset 3).
- Cracks in the concrete beam (Photoset 4).
- Sever horizontal crack in the existing building concrete frame near the beam attachment point (Photoset 4).

5.0 STRUCTURAL EVALUATION

The lack of availability of original construction drawings requires a load evaluation to be performed. Based on the dimensions, and estimated material type/grade of the existing structural elements, load capacity can be assessed using the current ASCE-7 and BIA design guidelines and standards.

In order to examine the effect of removing the existing concrete beam (flue) connecting the chimney to the adjacent building, two models for the chimney structure have been analyzed (Figure 2). In both models, distributed lateral wind forces along the entire height of the chimney structure were applied in the north-south direction. The first model (a) is based on the existing conditions, while the second model (b) is based on the scenario where the beam is completely removed and the chimney is acting as a "stand-alone" structure. As shown in Figure 2, the resulted flexural moment at the base of the chimney after removing the beam (case b) became much larger, compared to the case where the beam is connected to the chimney, by approximately 4 times. However, this difference in the moment at the bottom is based on the assumption that the connecting beam is supporting the chimney in the horizontal direction, 8 ft above ground, and transferring lateral forces from the chimney to the existing building frame (presented by the reaction at point A).

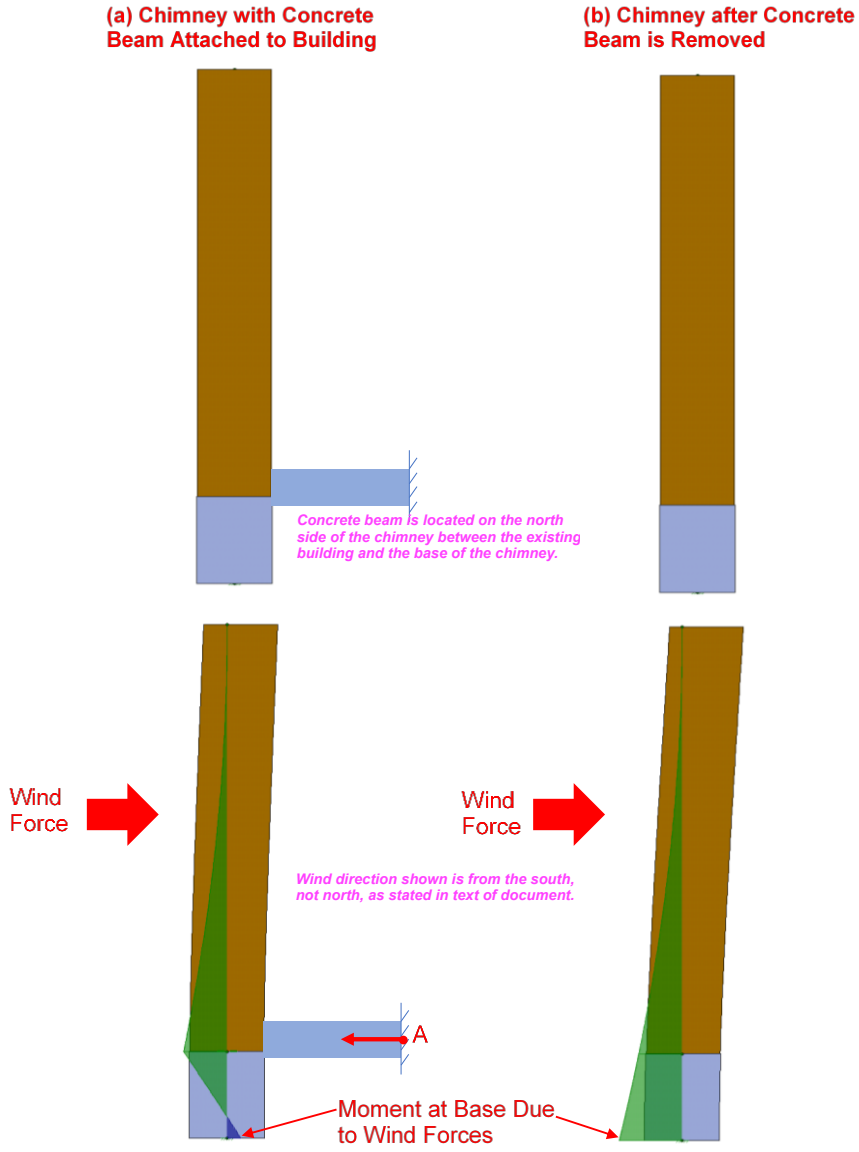


Figure 2. Concrete beam attachment to chimney and the adjacent building.

Furthermore, the analysis results showed significant lateral forces at point A, and thus for such large lateral force to be supported at that point, the beam must be connected to the building frame. This connection to the building frame was not visible from the inside of the building as shown in Photoset 5 where the beam is mainly passing through and supported by the existing wall, but not attached to the frame above.

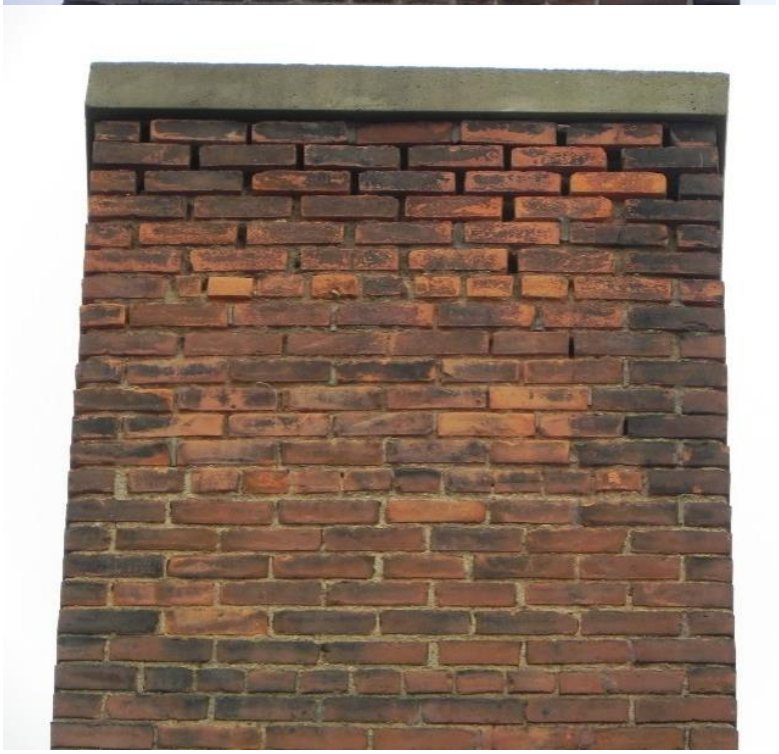
6.0 CONCLUSIONS AND RECOMMENDATIONS

In general, the chimney structure is in a fair to good condition. There are no signs of settlement of the existing chimney base, but a few areas of cracking and loose brick as listed above (section 4.0). However, it should be noted that these areas require major repairs to be made acceptable by current building code requirements. It is recommended to repoint loose brick with new mortar, especially at the top of the chimney, as soon as possible to avoid further deterioration that could potentially become severe and risk falling.

Since no structural connection between the concrete beam and the existing building frame was visible, it is assumed that the beam was not designed as a main lateral support member to the chimney structure. Therefore, removing this beam should not affect the lateral stability of the chimney as a stand-alone structure, assuming that the chimney is supported on an isolated foundation. Thus, if the final decision is to keep the chimney, isolating the chimney foundation against vibration and soil movement during demolition and construction is highly recommended. Temporary shoring is advised during demolition of the adjacent building, and until the new construction is completed.

Appendix A

Chimney Top



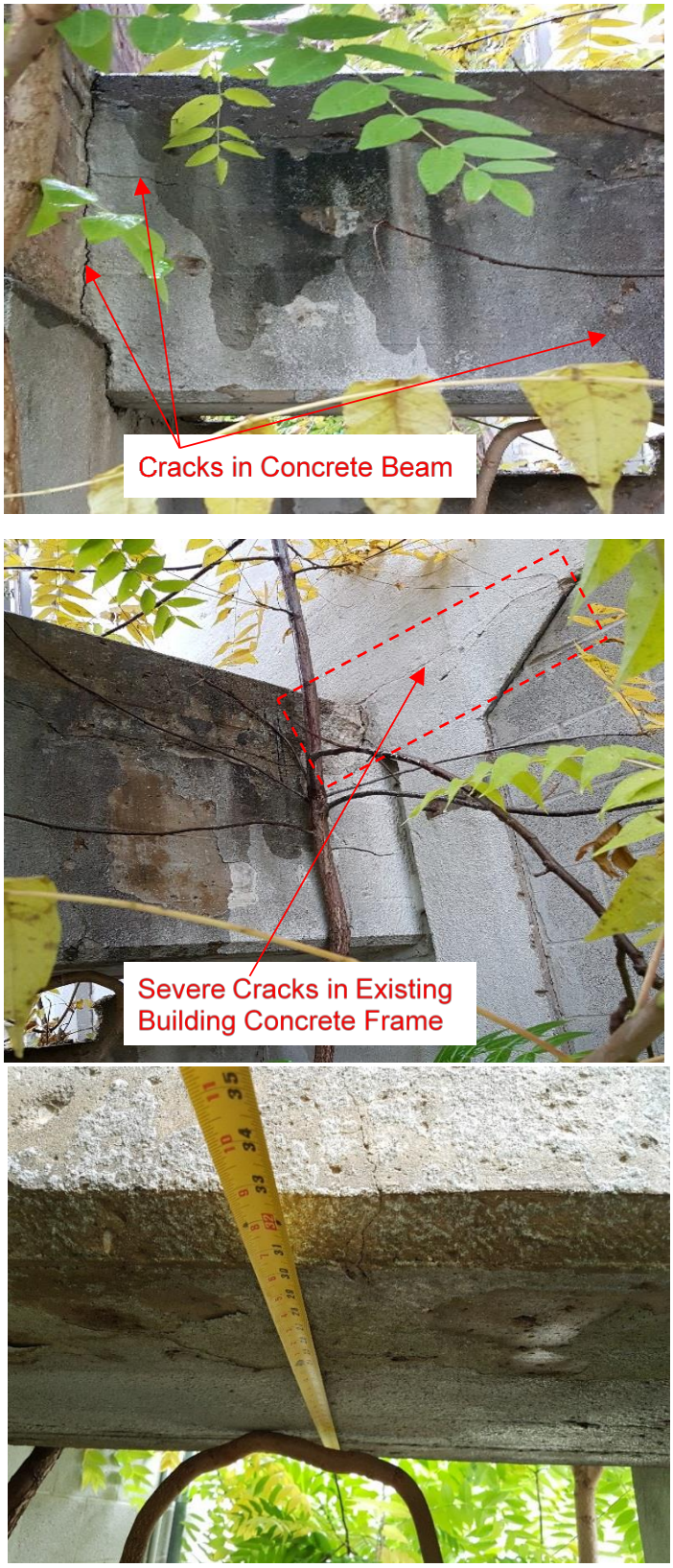
Photoset 1: Loose bricks and lack of mortar joints at top of chimney.

Chimney Base

Photoset 2: Major vertical cracks along the south and east sides of the base.

Photoset 3: Major horizontal cracks in brick above the concrete base along south and west sides.

Connecting Concrete Beam



Photoset 4: Cracks in concrete beam and the adjacent building frame.

Photoset 5: Extension of the concrete beam end to the inside of the adjacent building.

Your ref 20240292.20
Our ref 24122 – 415 W. Washington Chimney Condition
File ref

RESURGET
ENGINEERING
28 W. Adams Avenue
Suite 1710
Detroit, MI 48226
office +1 313 315 3290
direct +1 313 572 1506

james@resurget.engineering
www.resurget.engineering

Adrianna Melchior, AIA
Associate
Hubbell, Roth & Clark, Inc.
555 Hulet Drive
Bloomfield Hills, MI 48302

June 5, 2024

Dear Adrianna,

415 W. Washington Chimney Condition, Ann Arbor

Resurget Engineering PLC went to this site on 05/30/2024 to review the current condition of the brick masonry chimney and to confirm the adjacent existing building can be demolished with the chimney remaining. The following is the report of such activity.

EXISTING CHIIMNEY CONDITION

The existing chimney is of brick masonry construction on a cast in place concrete base adjacent to a vacant and closed Washtenaw Country Road Commission garage and 2 story offices. The chimney condition was reviewed from the ground level and by arial drone from all sides and above. The complex was constructed pre-1940's and existing structural building drawings were not available; therefore, this report is based on visual observations of the various components and experience. The chimney is approximately 50 feet tall and 5.5 ft x 5.5 ft in plan with the concrete base extending about 8 ft above surrounding grade. Also at about 8 ft above grade is a horizontal concrete flue attached to the chimney and the building wall at the boiler room. The concrete flue is about 2.75 ft by 2.75 ft in cross section and approximately 4 ft long. It does not appear to be rigidly attached to either the boiler room wall or chimney, just supported vertically be each. There is also a non-load bearing masonry wall under the concrete flue that is in poor condition. These were consistent with the findings of a previous November 2018 structural report by Desai/Nasr which also concluded the chimney could remain if the adjacent building was carefully demolished and some chimney repairs performed.

Several small cracks were noted in the parge coat on the concrete chimney base, but no vertical displacement or horizontal separation was observed and maybe only in the parge coat itself and do not warrant epoxy injection at this time.

The chimney brick is generally good to fair condition, it is multi wythe (assumed to be 3 wythes) in thickness of standard running bond with every 8th course being a row lock course. It was observed there were certain areas needing to be tuck pointed. Approximately the top 4 feet, both inside the shaft and the exterior need mortar repair. There were several other spot locations observed that need tuck pointing also, such as at the location of the concrete

flue bearing. A specific lineal quantity of tuck pointing should be specified for pricing with a contingency built in.

Large areas of exterior garage walls are of the same brick as the chimney and can be salvaged during the demolition to fill in the hole that will remain in the chimney wall when the flue is removed. The brick should be toothed in into each side and the horizontal row lock course continued where present. The flue and the chimney should be shored as required for careful demolition.

Photo 1: Photo of Chimney, Flue and Existing Building.

The existing building and concrete flue can be carefully removed, and the chimney can remain.

Photo 2: Existing Concrete Flue Bearing on Concrete Base.

Existing concrete flue to be shore and carefully removed. The opening in the chimney is to be filled in with salvaged existing brick. Tooth in each course on each side and continue existing row lock course.

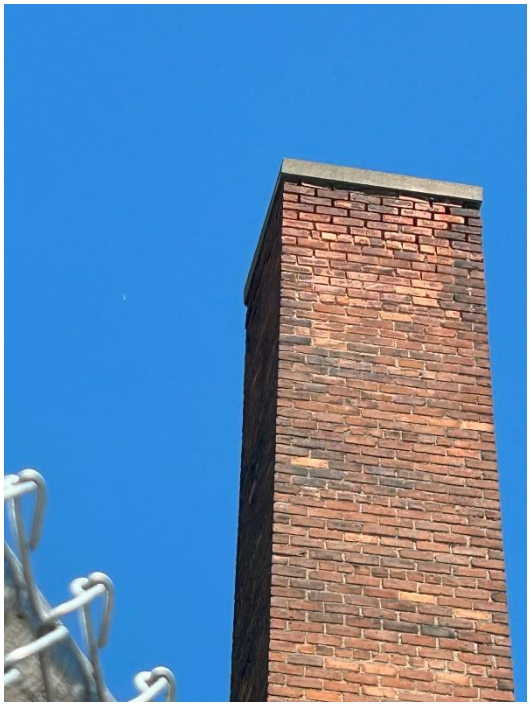


Photo 3: Top of Chimney with upper courses needed to be tuck pointed.

Loose mortar should be raked-out and new mortar installed and tooled.

Photo 4: Top of Chimney with upper courses needed to be tuck pointed.

Loose mortar should be raked-out and new mortar installed and tooled.

Recommendations

The existing garage and office building can be carefully demolished, and the chimney can remain free standing.

- Shore the chimney and concrete flue as required. Sawcut and remove flue from the chimney and the boiler wall and the existing non-load bearing CMU wall.
- Remove the existing brick as necessary on each side of the flue opening to tooth in brick salvaged from the garage demolition to fill in the opening hole from the concrete flue removal.
- On the chimney exterior and inside the shaft rake-out the loose mortar and repoint all of the bed and head joints in the upper for 4' of brick courses.
- On the chimney exterior rake-out the loose mortar and repoint all of the bed and head joints as directed by the architect.
- On the chimney exterior rake-out the mortar bed head joists to replace damaged brick units as directed by the architect.

Should you have any questions regarding this report, please do not hesitate to ask and we can discuss the conclusions herein.

Thank you for choosing Resurget Engineering PLC to serve you.

Sincerely,

James L. Yates, Ph. D., P.E.
Senior Associate

attachments

721 N. MAIN REFERENCE DRAWINGS - APPENDIX G

NORTH MAIN STREET

SUMMIT STREET

HILLCREST

ALLEN CREEK

DEMOLITION AREA

THESE BUILDINGS HAVE ALREADY BEEN DEMOLISHED - N/A

MUNICIPAL GARAGE

STORAGE BLDG.

SALT STORAGE BLDG.

SAND/SALT STORAGE

GRAVEL

ASPHALT

CONCRETE

EAVES THROUGH (TYP)

AREA TO BE REGRADED

128 LF 12" C-76 III RCP @ 2.90 %

90 LF 4" CL III RCP @ 8.0 %

VERIFY LOCATION OF 1.5" COPPER WATER LINE PRIOR TO PLACEMENT OF STORM SEWER

ASHLEY ST.

FELCH ST.

A.A.R.R.

STANDARD OIL CO.

NORTH

SCALE 1"=30'-0"

DIGITAL STATUS
SCANNED ON: 7-99
BY: LASON
DESPECKLED: NO
VECTORS: NO
O.C.R.: NO

NOT AS-BUILT
BEST AVAILABLE
INFORMATION

BENCH MARK #1
STEAMER VALVE
ON FIRE HYDRANT
ELEV. 779.10

BENCH MARK #2
BOAT SPIKE IN
N.W. SIDE
ELEV. 779.92

NOTE
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

AS-BUILT STORM DRAWING
CORRECTED UNKNOWN
CONSTRUCTION COMPLETED UNKNOWN
MANDREL TEST (HDPE PIPE) COMPLETED UNKNOWN
T.V. TEST COMPLETED UNKOWN

REFERENCE LINE
TWO INCHES
0 1 2

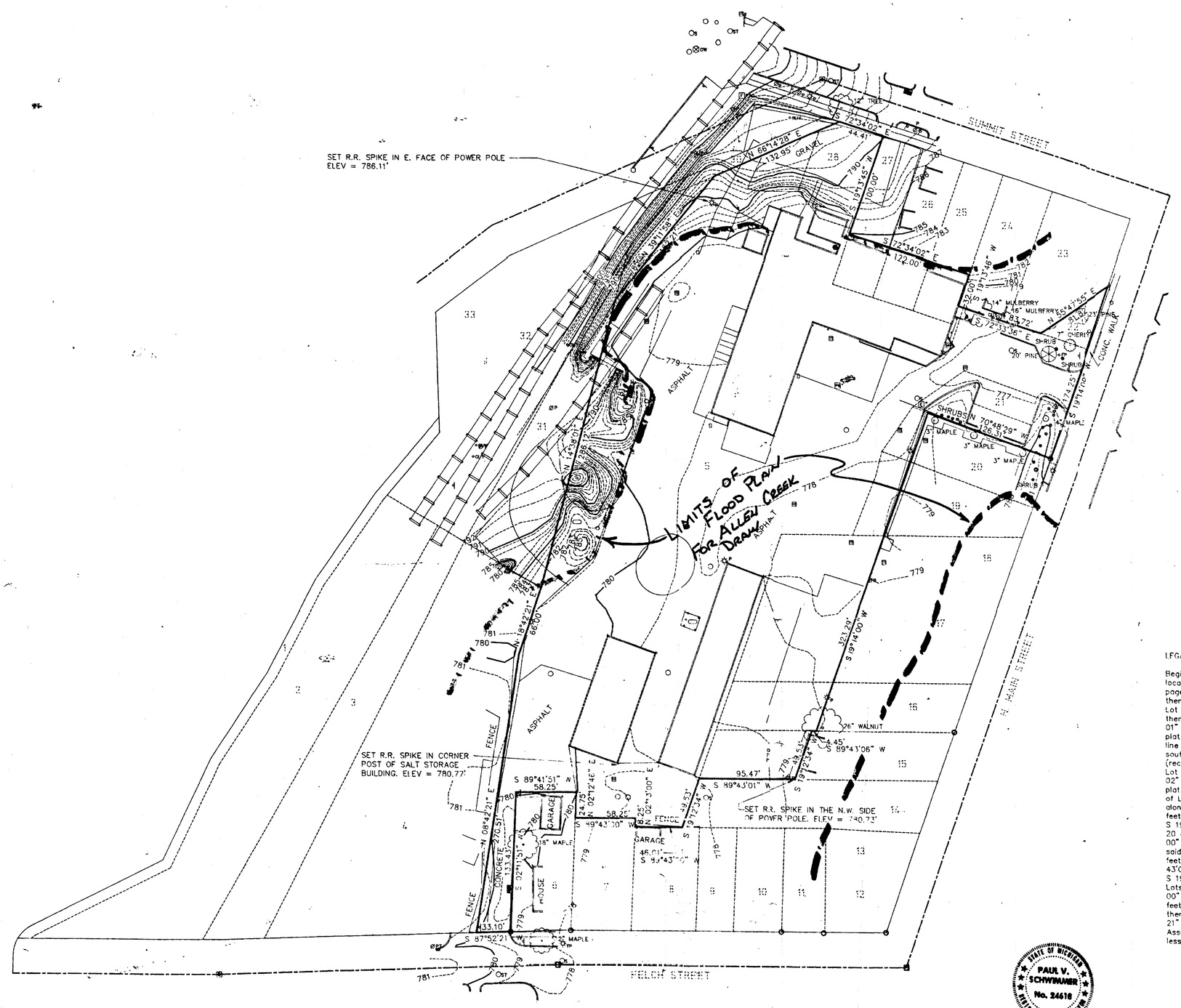
Digital Status
Scanned On: 11/25/05
By: LES

SURVEY BOOK	DR. BY	CH. BY	DATE	NO. OR LETTER	REVISIONS	DR. BY	DATE
	R.W.	W.R.W.	10/19/97		AS-BUILT	SMJ	8-97 9/99

ENGINEERING DEPARTMENT – CITY OF ANN ARBOR

CITY OF ANN ARBOR
MUNICIPAL GARAGE
SALT/SAND CONTAINMENT FACILITY

SCALE	
HORZ.	1"=30'-0"
VERT.	1"=30'-0"
INCH	
DRAWING NO.	87033-1
SHEET NO.	1 OF 2



LEGEND

- FOUND IRON
- MONUMENT BOX
- SANITARY MANHOLE
- STORM MANHOLE
- CATCH BASIN
- CATCH BASIN
- CATCH BASIN
- WATER VALVE
- UTILITY POLE
- HYDRANT
- MAILBOX
- TRANSFORMER PAD
- LIGHT POLE
- SIGN
- POST

LEGAL DESCRIPTION

Beginning at the S.E. Corner of Lot 4, Assessor's Plat No. 22 located in the City of Ann Arbor and recorded in Liber 9 of Plats, page 6, Washtenaw County Records, Washtenaw County, Michigan; thence the following two courses along the easterly line of said Lot 4 N 08°42'21" E 270.51 feet and N 18°42'21" E 66.00 feet; thence along the easterly line of Lot 31 of said plat N 14°38' 01" E 286.12 feet; thence along the easterly line of Lot 30 of said plat N 19°11'58" E 152.21 feet; thence along the southeasterly line of Lot 29 N 66°14'28" E 132.95 feet; thence along the southerly right of way of Summit Street S 72°34'02" E 44.41 feet (recorded as S 72°33'30" E); thence along the westerly line of Lot 27 of said plat S 19°13'45" W 100.00 feet; thence S 72°34' 02" E 122.00 feet; thence along the westerly line of Lot 24 of said plat S 19°13'46" W 32.00 feet; thence along the southerly line of Lots 24 & 23 of said plat S 72°33'36" E 83.72 feet; thence along the southeasterly line of said Lot 23 N 55°47'55" E 81.82 feet; thence along the westerly right of way of N. Main Street S 19°14'00" W 174.25 feet; thence along the northerly line of Lot 20 of said plat N 70°48'29" W 126.31 feet; thence S 19°14' 00" W 323.29 feet; thence along the northerly line of Lot 15 of said plat S 89°43'06" W 4.45 feet; thence S 19°12'34" W 49.53 feet; thence along the north line of Lot 14 of said plat S 89° 43'01" W 95.47 feet; thence along the westerly line of said Lot 14 S 19°12'34" W 49.53 feet; thence the following six courses along Lots 8,7, & 6 of said plat S 89°43'00" W 46.01 feet, N 02°13' 00" E 8.25 feet, S 89°43'00" W 58.25 feet, N 02°12'46" E 24.75 feet, S 89°41'51" W 58.25 feet, and S 02°11'51" W 133.43 feet; thence along the northerly right of way of Felch Street S87°52' 21" W 33.10 feet to the Point of Beginning. Being a part of said Assessor's Plat No. 22 and containing 4.652 acres of land, more or less. Subject to easements of record.

STATE OF MICHIGAN
PAUL V. SCHWIMMER
No. 24618
REGISTERED LAND SURVEYOR

Digital Status
Scanned On: 9-15-05
By: LES

REV.		
REV.		
REV.		
REV.		
REV.		
	–	ORIGINAL ISSUE: 6-07-1991

DRAWN BY: – P.V.S. CHECKED BY: – C.R.O.

AYRES, LEWIS, NORRIS & MAY, INC.
ENGINEERS · PLANNERS · SURVEYORS
JUN 19 1991
Ann Arbor, Michigan 48108
SEALED:

CITY OF ANN ARBOR
NORTH MAIN STREET DPW

BOUNDARY SURVEY AND TOPOGRAPHICAL SURVEY

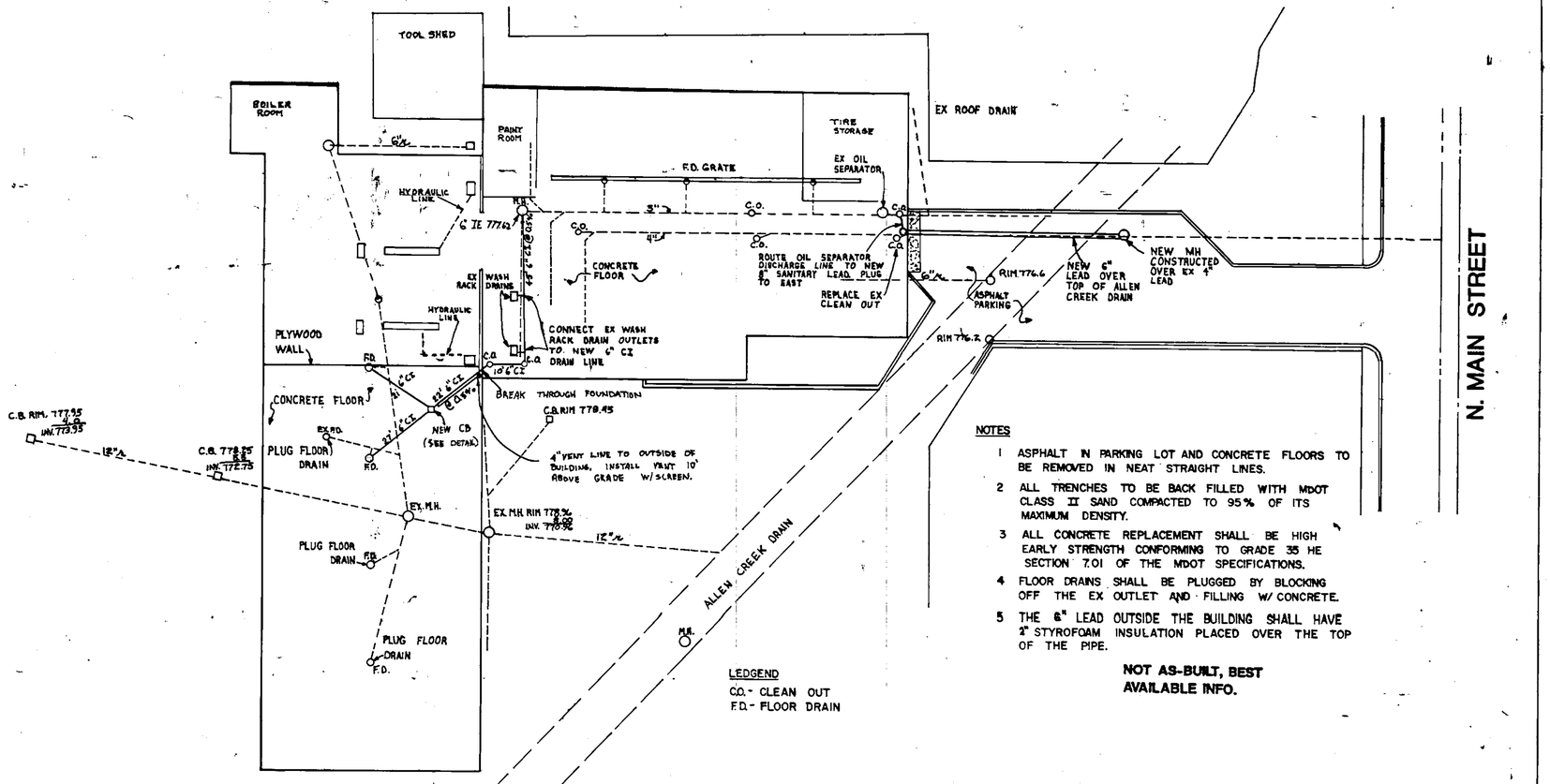
Ayres, Lewis, Norris & May, Inc.
Engineers • Planners • Surveyors
3950 Research Park Drive
Ann Arbor, Michigan 48108
(313) 761-1010

SCALE: – 1" = 50'

55462-02 | REVISION 2

35 of 51

721 N. MAIN GIS
STORM SEWER MAP

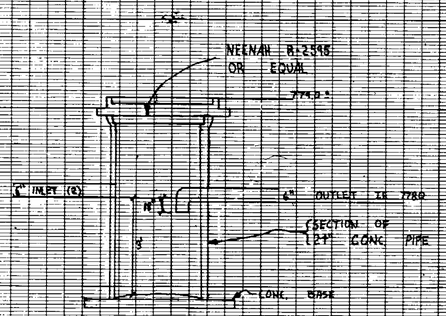


NOTES

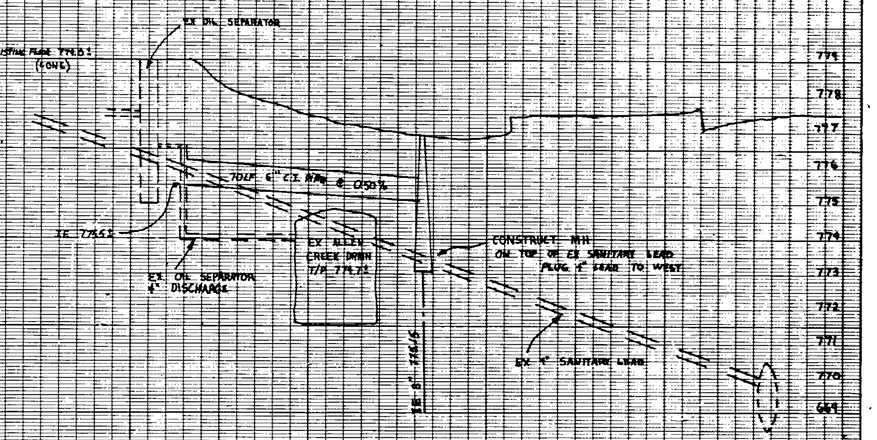
1. ASPHALT IN PARKING LOT AND CONCRETE FLOORS TO BE REMOVED IN NEAT STRAIGHT LINES.
2. ALL TRENCHES TO BE BACK FILLED WITH MDOT CLASS II SAND COMPACTED TO 95% OF ITS MAXIMUM DENSITY.
3. ALL CONCRETE REPLACEMENT SHALL BE HIGH EARLY STRENGTH CONFORMING TO GRADE 35 HE SECTION 7.01 OF THE MDOT SPECIFICATIONS.
4. FLOOR DRAINS SHALL BE PLUGGED BY BLOCKING OFF THE EX OUTLET AND FILLING W/ CONCRETE.
5. THE 6" LEAD OUTSIDE THE BUILDING SHALL HAVE 2" STYROFOAM INSULATION PLACED OVER THE TOP OF THE PIPE.

NOT AS-BUILT, BEST AVAILABLE INFO.

LEDGEND
C.O. - CLEAN OUT
F.D. - FLOOR DRAIN



CATCH BASIN DETAIL (NTS)



GRAPHIC SCALE
0 1 2

NOTE
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

PREPARED BY

SURVEY BOOK	DR. BY	CH. BY	DATE	NO. OR LETTER	REVISIONS	DR. BY	DATE
	J.A.	AG.	7/85				

ENGINEERING DEPARTMENT – CITY OF ANN ARBOR

MUNICIPAL GARAGE

721 N. MAIN STREET

FLOOR DRAINS

APPROVED BY Leigh A. Chizek
LEIGH A. CHIZEK CITY ENGINEER

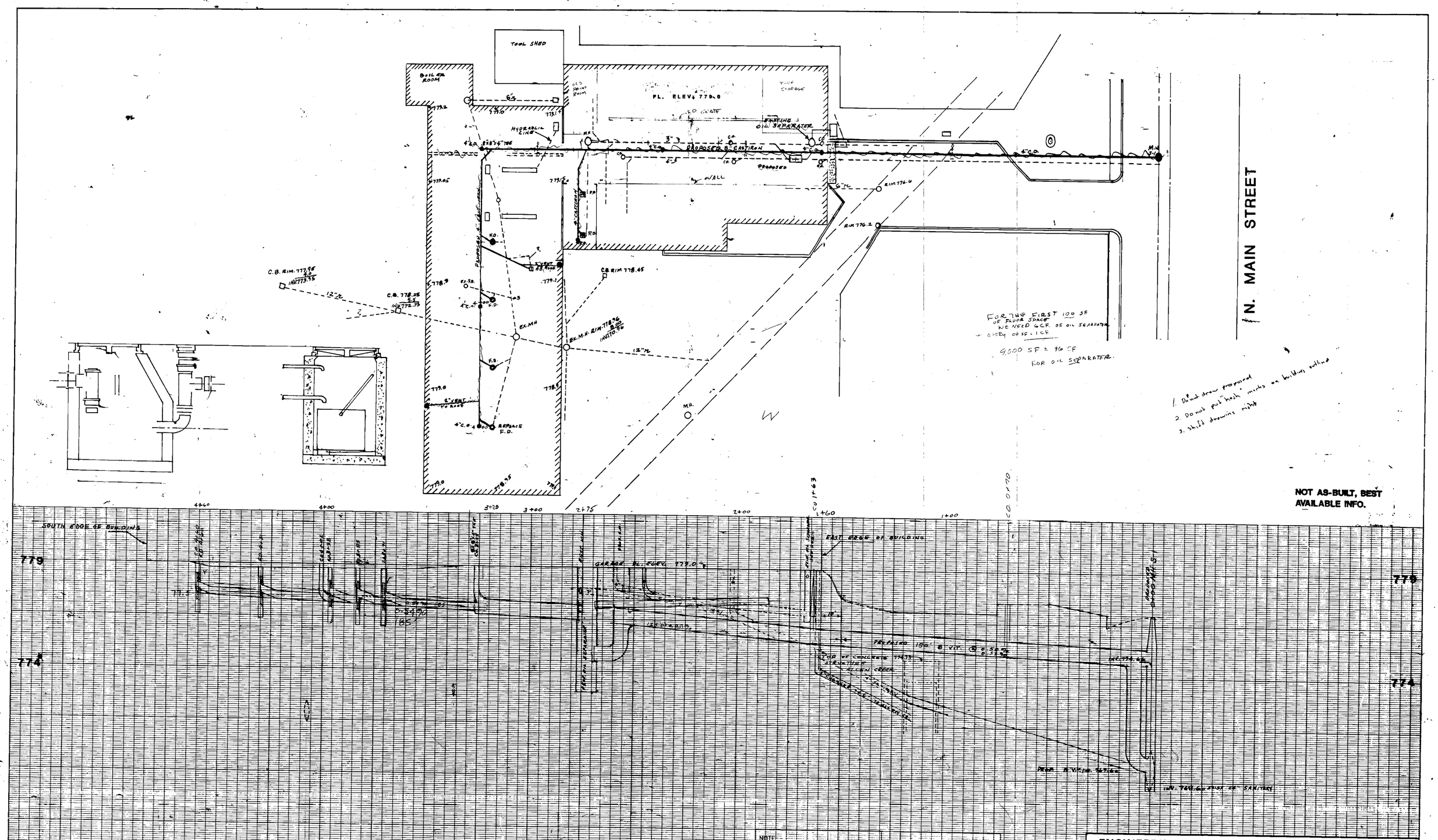
SCALE	
HORZ.	1" = 20'
VERT.	1" = 2'
INCH	

DRAWING NO. 85021-1

SHEET NO. 1 OF 2

Digital Status
Scanned On 4-15-05
By: LBZ

TELEDYNE POST



NOTE:
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

GRAPHIC SCALE

SURVEY BOOK	DR. BY	CH. BY	DATE	NO. OR LETTER	REVISIONS	DR. BY	DATE
	AL		1-84				

ENGINEERING DEPARTMENT – CITY OF ANN ARBOR

MUNICIPAL GARAGE

N. MAIN STREET

SANITARY SEWER

SCALE	
HORZ.	1" = 20'
VERT.	1" = 2'
INCH	

DRAWING NO. 85021-3

SHEET NO. ____ OF ____

Digital Status
Scanned On: 8-15-05
By: LEP

TELEDYNE POST

AS-BUILT STORM DRAWING

CORRECTED 5-24-94

CONSTRUCTION COMPLETED

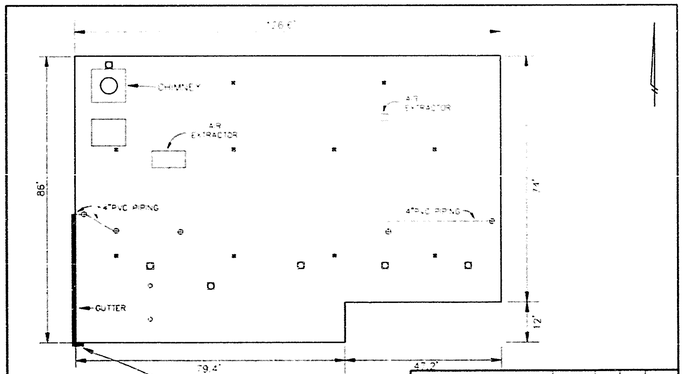
MANDREL TEST COMPLETED
(NONE REQ'D)

T.V. TEST COMPLETED

GRAPHIC SCALE

TWO INCHES

0 1 2



LEGEND:
- ROOF MOISTURE VENTS *
- VENT STACKS ○
- AIR EXTRACTOR ▭
- VENTS □
- DRAIN SUMP & STRAINER ⊕

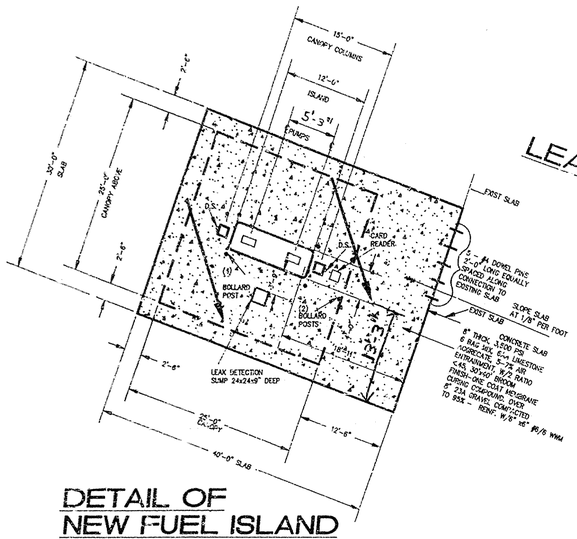
NOTE: ATACTIC POLYPROPYLENE (APP) ROOF

AS-BUILT	1	SMM	CH	5-94
REVISIONS	REV. NO.	DR.BY	CH. BY	DATE

PUBLIC SERVICES DEPARTMENT
CITY OF ANN ARBOR

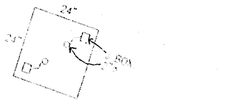
CITY GARAGE ROOF

DR. BY	DF/KDS	CH. BY	CH	DRAWING NO.
SCALE	1"=20'	DATE	7-1-93	93085 - TOP
INCH				SHEET NO. 2 OF 2

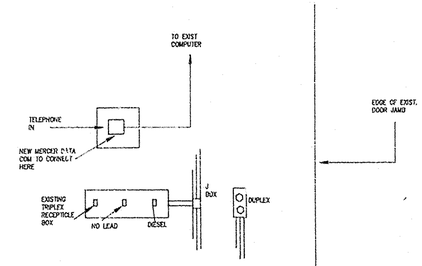


DETAIL OF NEW FUEL ISLAND

SCALE 1"=10'

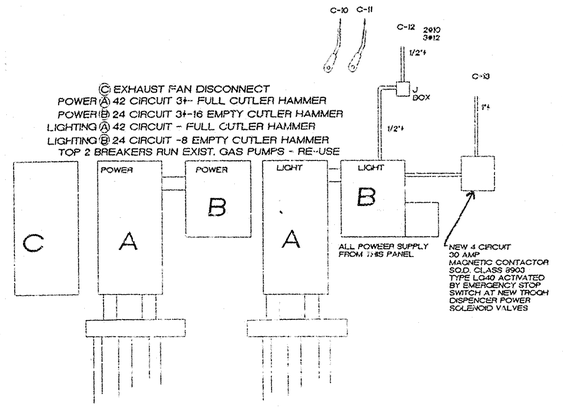


PLAN INSIDE LEAK DETECTION SUMP



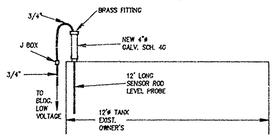
EXISITING COMPONENTS IN OFFICE (SEE PLAN)

SCALE: NO SCALE



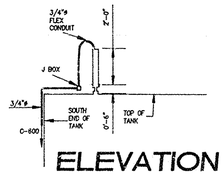
EXISTING ELECTRICAL PANELS

SCALE: NO SCALE



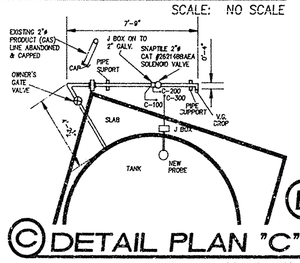
ELEVATION TOP OF GASOLINE TANK

SCALE: NO SCALE



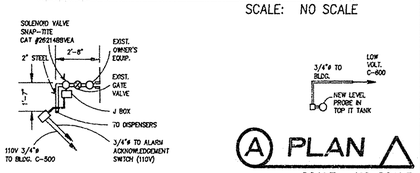
ELEVATION - TOP OF DIESEL TANK

SCALE: NO SCALE



Ⓒ DETAIL PLAN "C"

SCALE: NO SCALE

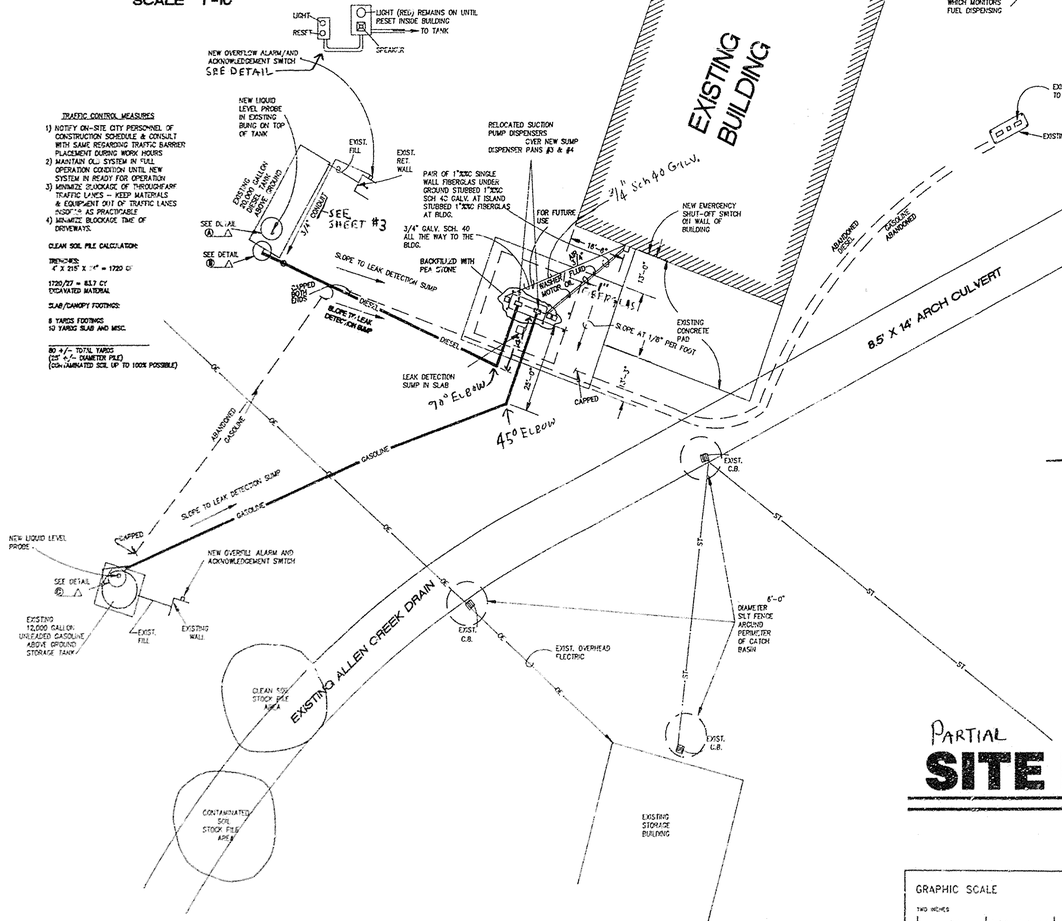


Ⓐ PLAN

SCALE: NO SCALE

Ⓑ DETAIL PLAN "B"

SCALE: NO SCALE



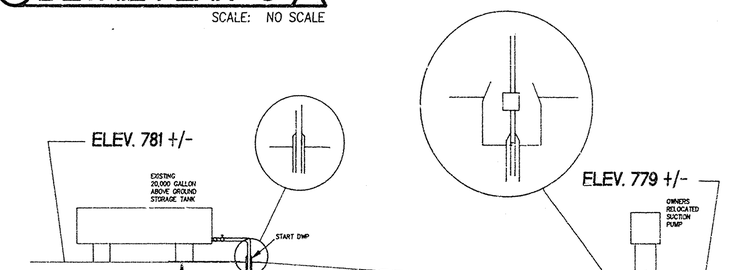
AS-BUILT DRAWING
CORRECTED R.W. MERCER CO. (12-14-96)

PARTIAL SITE PLAN

SCALE: 1"=20'

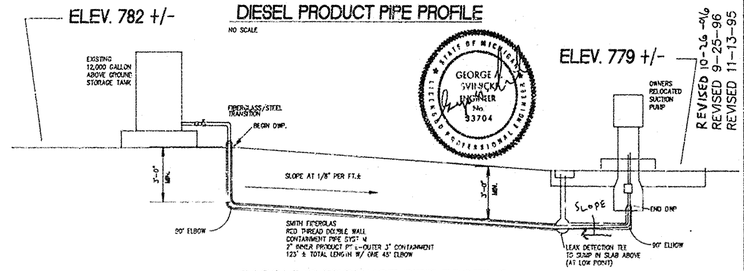
GRAPHIC SCALE
TWO INCHES
0 1 2

NOTE
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.



DIESEL PRODUCT PIPE PROFILE

NO SCALE



GASOLINE PRODUCT PIPE PROFILE

NO SCALE

STATE OF MICHIGAN GEORGE SVINICKI ENGINEER No. 33704 REGISTERED PROFESSIONAL ENGINEER

REVISED 10-24-96
REVISED 9-25-96
REVISED 11-13-95

95019

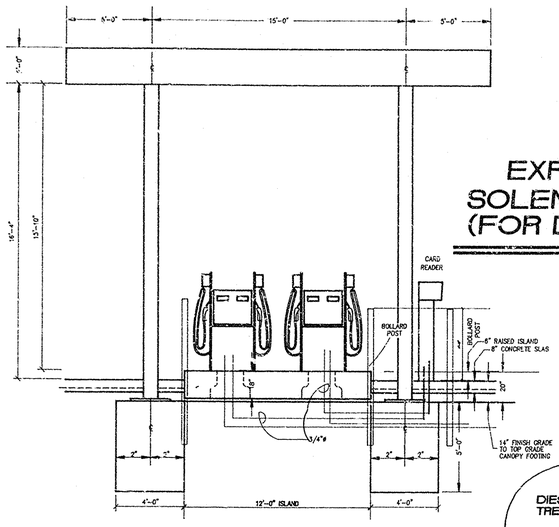
SVINICKI ASSOCIATES
BUILDING DESIGN LAND PLANNING
GEORGE A. SVINICKI PROFESSIONAL ENGINEER
3228 WOODVALLEY ROAD JACKSON, MICHIGAN 49201 PH 517-782-1031

R.W. MERCER CO.
2322 BROOKLYN ROAD
JACKSON, MICHIGAN 49204
517-787-2960

PROJECT
NEW FUEL LINES/CANOPY
CITY OF ANN ARBOR
MAIN STREET
DEPT. OF PUBLIC WORKS
FILE NAME: 9559SITI
PROJECT No. 9559

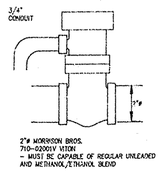
SHEET TITLE
SITE PLAN
DATE: 10-17-95

SHEET No.
1
OF 4



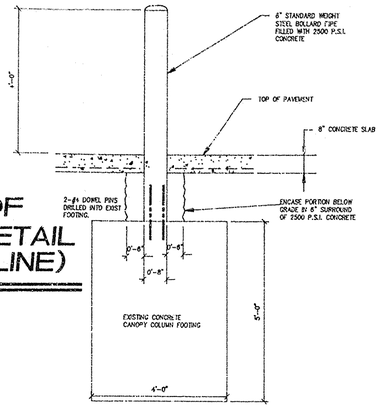
PROFILE OF NEW ISLAND

SCALE: 1/4" = 1'-0"



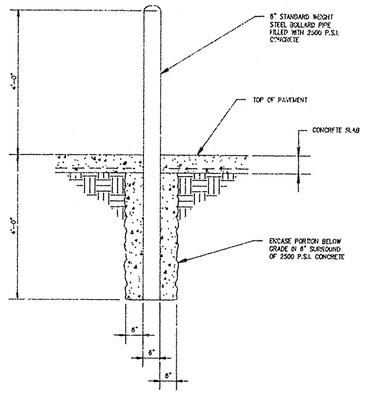
EXPLOSION PROOF SOLENOID VALVE DETAIL (FOR DIESEL/GASOLINE)

NO SCALE



SPECIAL BOLLARD POST DETAIL

SCALE: 1/2"=1'-0"



BOLLARD POST DETAIL

SCALE: 1/2"=1'-0"

AS-BUILT DRAWING
CORRECTED R.W. MERCER CO.
(2-14-96)

NOTE
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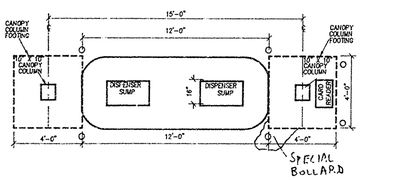
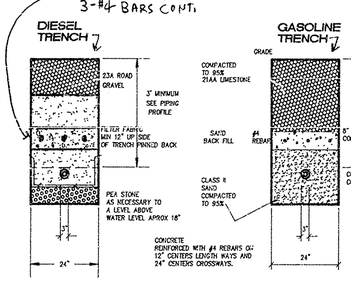
GRAPHIC SCALE
TWO INCHES
0 1 2



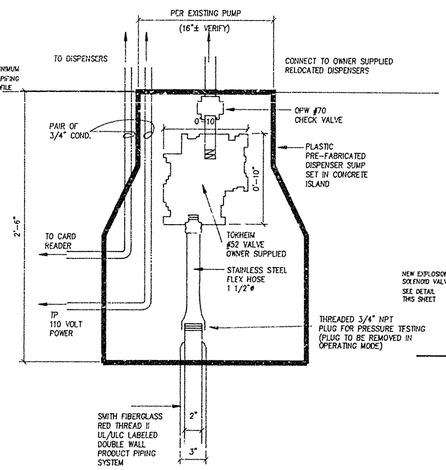
PLAN AT NEW ISLAND

SCALE: 1/2" = 1'-0"



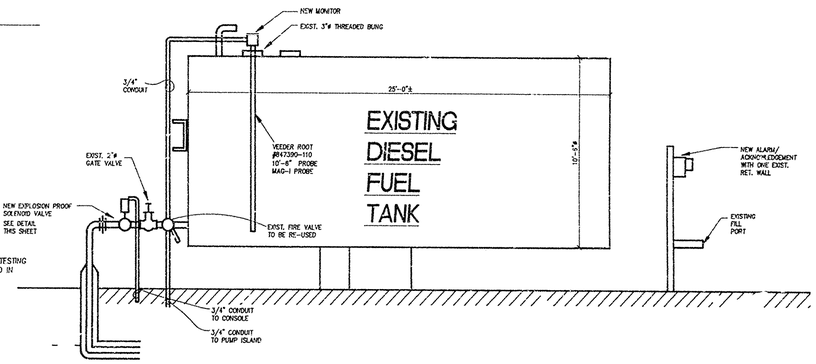
PRODUCT PIPE BEDDING DETAIL

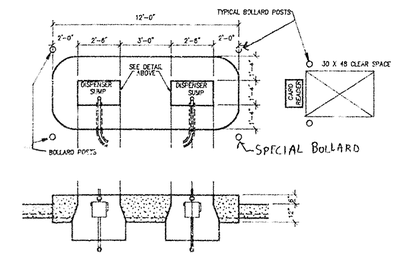
NO SCALE



#3 + #4 DISPENSER SUMP DETAIL

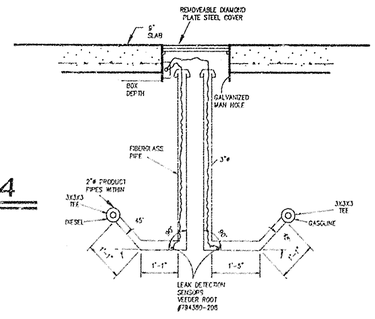
NO SCALE



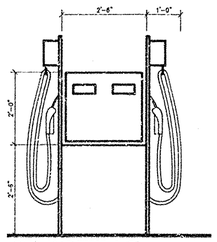


PROFILE OF DISPENSER SUMPS #3 + 4

SCALE: 1/2" = 1'-0"

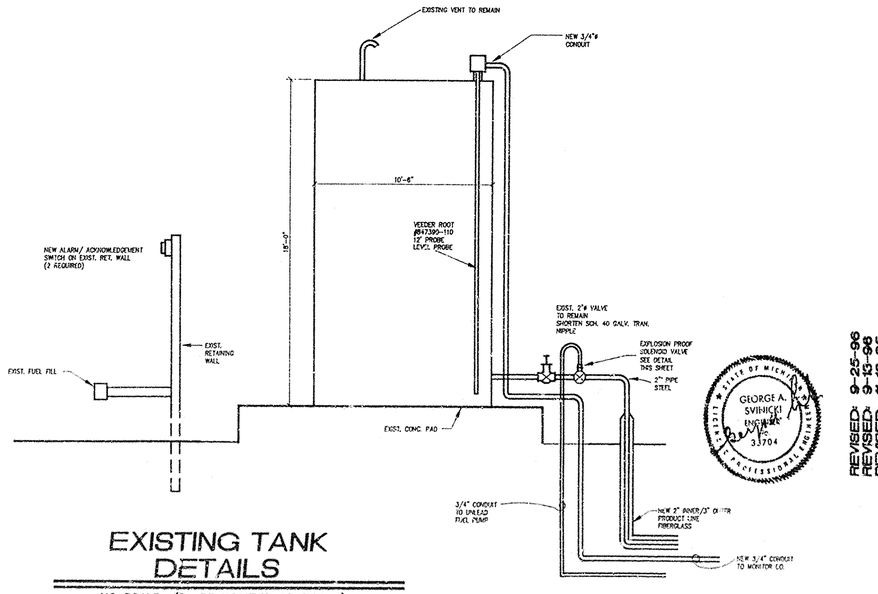


PROFILE-DETAIL OF LEAK DETECTION SUMP



EXISTING SUCTION PUMP FUEL DISPENSER

NO SCALE (TO BE REUSED)



EXISTING TANK DETAILS

NO SCALE (TO BE MODIFIED AS SHOWN)

95019

SVINICKI ASSOCIATES
LAND PLANNING
BUILDING DESIGN PROFESSIONAL ENGINEER
GEORGE A. SVINICKI 48933
3838 ROOSEVELT ROAD JACKSON, MICHIGAN PH: 517-782-0321

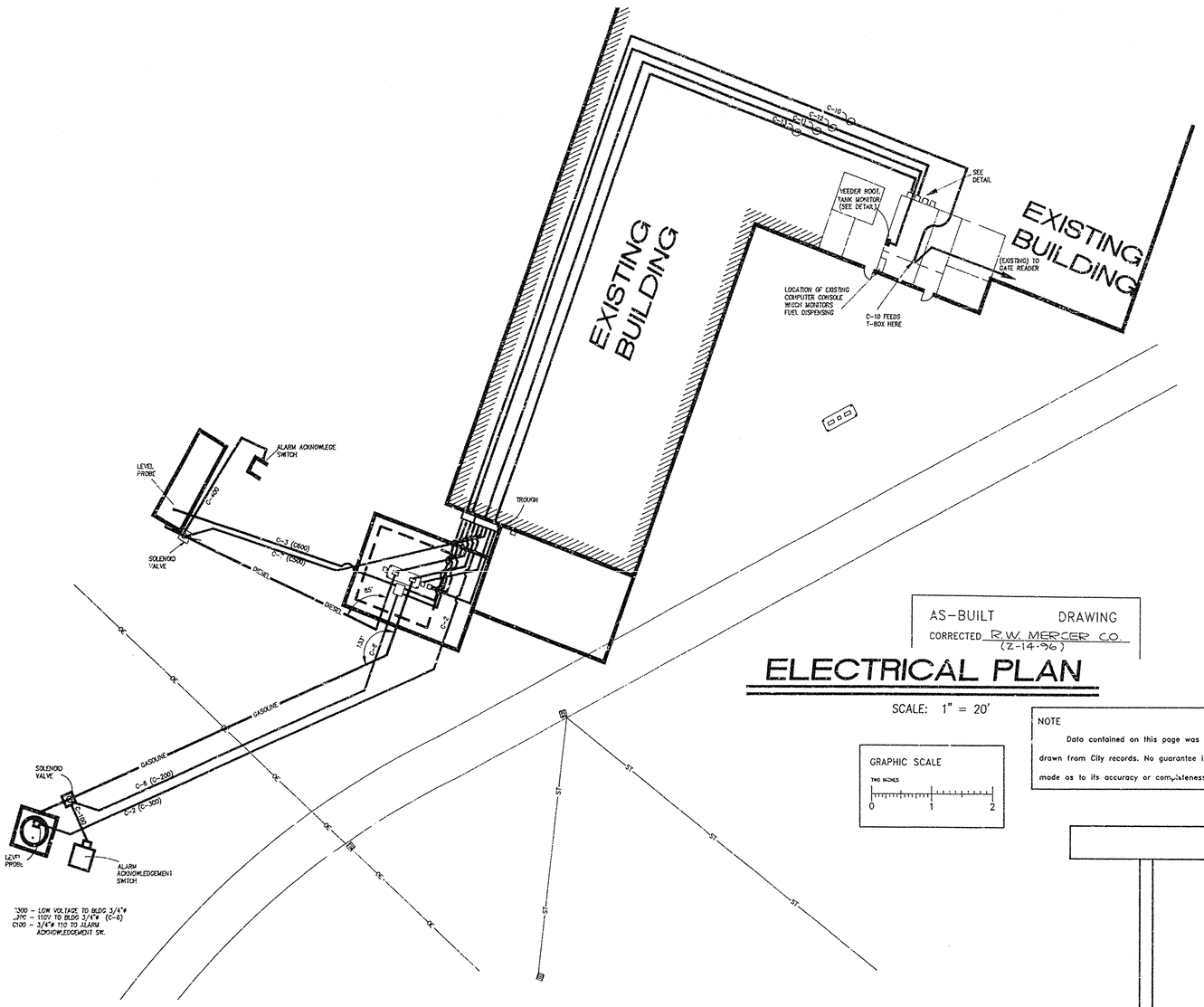
R.W. MERCER CO.
2322 BROOKLYN ROAD
JACKSON, MICHIGAN 49204
517-787-2960

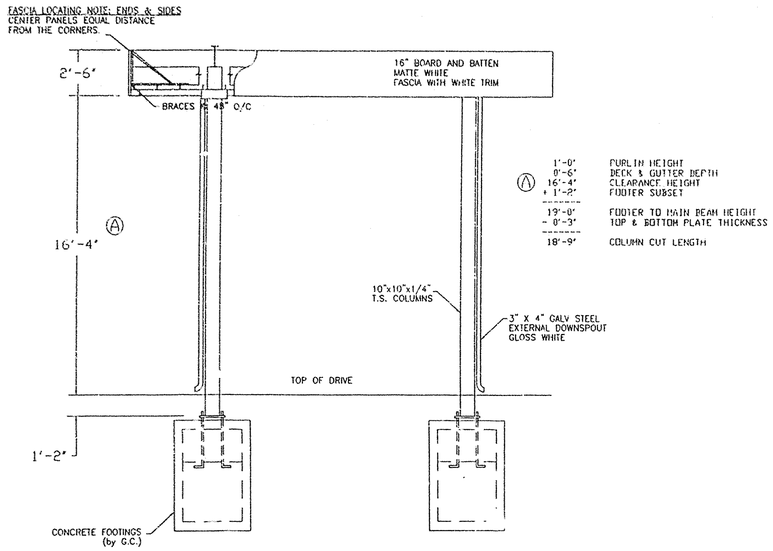
PROJECT
NEW FUEL LINES/CANOPY
CITY OF ANN ARBOR
MAIN STREET
DEPT. OF PUBLIC WORKS
FILE NAME: 9559DETA
PROJECT No. 9559

SHEET TITLE
DETAILS
DATE: 1/10/95

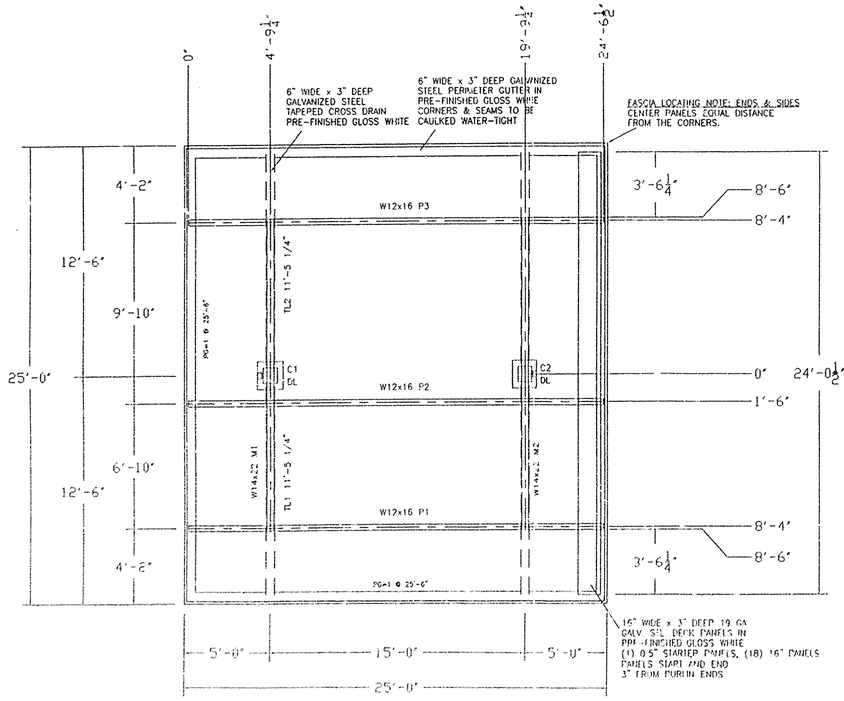
REVISED: 9-25-96
REVISED: 9-19-96
REVISED: 11-13-95

SHEET No.
2
OF 4

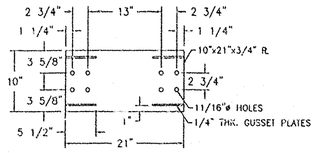

EXISTING BUILDING
EXISTING BUILDING
VEEDER ROOT TANK MONITOR (SEE DETAIL)
SEE DETAIL
(EXISTING) TO DATE READER
LOCATION OF EXISTING COMPUTER CONSOLE WHICH MONITORS FUEL DISPENSING
C-10 FEEDS T-BOX HERE
C-10
C-11
C-12
ALARM ACKNOWLEDGE SWITCH
LEVEL PROBE
C-400
TROUGH
C-3 (C-300)
C-1 (C-100)
SOLENOID VALVE
DIESEL
DIESEL
C-4
C-5
C-2
GASOLINE
GASOLINE
C-6 (C-200)
C-7 (C-500)
SOLENOID VALVE
LEVEL PROBE
ALARM ACKNOWLEDGEMENT SWITCH
85'
45°
45°
45°



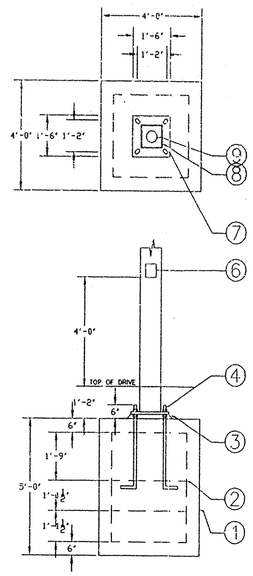
SIDE ELEVATION

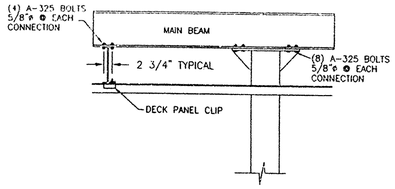


CANOPY FRAMING PLAN



CAP PLATE DETAIL





STRUCTURAL CONNECTIONS DETAIL

AS-BUILT DRAWING
CORRECTED R.W. MERCER CO.
(2-14-96)

NOTE
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GRAPHIC SCALE
TWO INCHES
0 1 2

NOTE DIRECTION OF DOWNSPOUTS RELATIVE TO COLUMNS. ALSO INDICATE NORTH RELATIVE TO PLAN.

ERECTOR NOTES

A. ALL LEVELING NUTS AND FOOTING ELEVATIONS MUST BE CHECKED WITH A TRANSIT. VERIFY ALL FOOTING BOLT CENTERS.

B. CHECK ALL STEEL FOR PLUMB, SQUARE, AND LEVEL AFTER IT IS ERECTED.

C. TORQUE ALL 5/8"ø A-325 H.S. CONNECTION BOLTS TO 200 FOOT POUNDS. TORQUE ALL 3/4"ø A-325 H.S. CONNECTION BOLTS TO 355 FOOT POUNDS.

D. CHECK LEVELNESS OF BOTTOM OF PURLINS WITH A TRANSIT.

E. ALL BRACING FOR BEAMS AND PURLINS IS TO BE WELDED ON BEFORE DECK PANELS ARE INSTALLED.

F. FIELD PRIME ALL STRUCTURAL STEEL CONNECTIONS AND SPLICES AFTER STEEL IS ERECTED.

GENERAL NOTES

I. CONCRETE FOR FOOTERS SHALL ACHIEVE A MINIMUM COMPRESSION STRENGTH OF 3000 PSI.

II. AN ASSUMED SOIL BEARING OF 3000 PSF AND PASSIVE SOIL PRESSURE OF 300 PSF/FT SHALL BE VERIFIED IN THE FIELD. IF TESTS INDICATE LESS CAPACITY, TFC SHALL BE NOTIFIED IMMEDIATELY FOR REDESIGN OF FOOTERS.

III. ALL CONSTRUCTION SHALL CONFORM TO APPLICABLE STATE AND LOCAL CODES.

IV. ALL STRUCTURAL SHAPES AND PLATES USED IN THIS CONSTRUCTION SHALL COMPLY WITH ASTM SPECIFICATIONS DESIGNATED A-36, EXCEPT STRUCTURAL TUBING WHICH SHALL COMPLY WITH ASTM SPECIFICATION A-500, GRADE B.

V. ALL WELDING UNLESS SPECIFICALLY NOTED SHALL BE PERFORMED ", THE COMPANY SHOP BEFORE, SHIPMENT. ALL WELDS SHALL BE 'FULL' WELDS, A MINIMUM OF 1/4" SIZE AND PERFORMED BY CERTIFIED WELDERS.

FOOTER NOTES

1. CONCRETE BASE BY GENERAL CONTRACTOR.
2. #4 BARS @ 12" o/c EACH WAY BY GENERAL CONTRACTOR. 4 LAYERS REQUIRED AND 1 BAR VERTICAL AT EACH CORNER
3. IF BASE PLATE MUST BE SHIMMED FOR LEVELING, GENERAL CONTRACTOR MUST FILL UNDER BASE PLATE WITH NON-SHRINK GROUT. GROUT MUST BE A MINIMUM OF 1 1/8" THICK TO A MAXIMUM OF 3 5/8" THICK.
4. 1 1/4"ø x 36" LONG A-36 ANCHOR BOLTS WITH 6" BENT LEG AND 6" THREADED PROJECTION WITH DOUBLE NUTS FOR PLUMBING AND LEVELING. (4 REQUIRED PER COLUMN)
5. ALLOW A 36" SQUARE OPENING IN DRIVE AT COLUMNS FOR INSTALLATION OF ANCHOR BOLT NUTS. OPENING TO BE FILLED WITH CONCRETE AFTER ERECTION.
6. ELECTRICAL ACCESS OPENING (4"ø HOLE) WITH 5"x6" COVER PLATE LOCATED APPROXIMATELY 4' ABOVE TOP OF DRIVE.
7. BASE PLATES ARE 18"x18"x1" THICK A-36 STEEL WITH (4) 1 1/2"ø BOLT HOLES ON 14" CENTERS AND A 5"ø HOLE FOR ELEC. AND DRAIN ACCESS.
8. TUBE STEEL COLUMN.
9. UNLESS OTHERWISE NOTED OR INDICATED ON PREVIOUS FOOTER DETAIL TOPS OF FOOTERS MUST BE HELD LEVEL AND ON THE SAME PLANE.

NOTICE

THIS CANOPY STRUCTURE MEETS OR EXCEEDS THE STANDARDS AND SPECIFICATIONS OF TFC CANOPY. ANY ALTERATIONS OF THE STRUCTURAL STEEL ON THIS CANOPY WITHOUT THE WRITTEN CONSENT OF TFC CANOPY WILL VOID TFC CANOPY OF ANY RESPONSIBILITY IN THE EVENT OF STRUCTURAL FAILURE.

Drawing Prepared by TFC
Under Supervision of the
Project Engineer

REV	DESCRIPTION	DATE	BY
A	CLEAR HEIGHT WAS 18'-0" PCO#001930	11/29/95	GRI

☑ OFFICE ☐ ERECTOR ☐ STEEL ☐ ENGR.

JOB NO.: 950922
QUOTE NO.: 15916

TFC CLASSIC © 1994 TFC CANOPY PARADESIGN

LIVE LOAD 30 PSF	UPLIFT LOAD: 30 PSF	WIND LOAD: 25 PSF

25' x 25' 2-COLUMN

Loc. NA
JACKSON, MI

Cust. R.W. MERCER COMPANY 95019

STATE OF MICHIGAN
GEORGE A. SVINICKI
GARDNER
No. 33704
PROFESSIONAL ENGINEER

SVINICKI ASSOCIATES
BUILDING DESIGN LAND PLANNING
GEORGE A. SVINICKI PROFESSIONAL ENGINEER
3329 ROOSEVELT ROAD JACKSON, MICHIGAN 49203 PH 517-788-0331

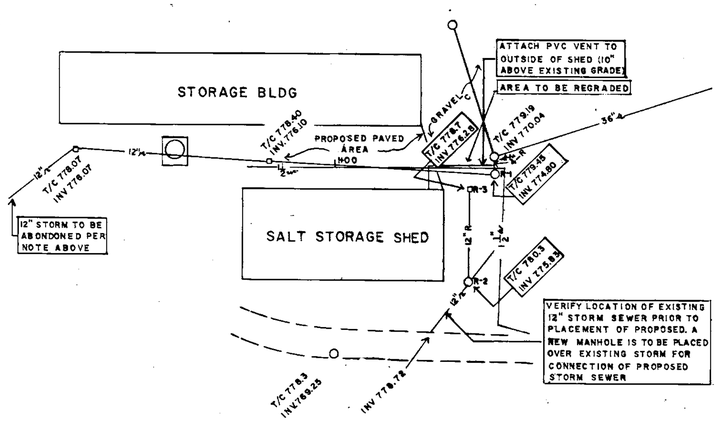
R.W. MERCER CO.
2322 BROOKLYN ROAD
JACKSON, MICHIGAN 49204
517-787-2960

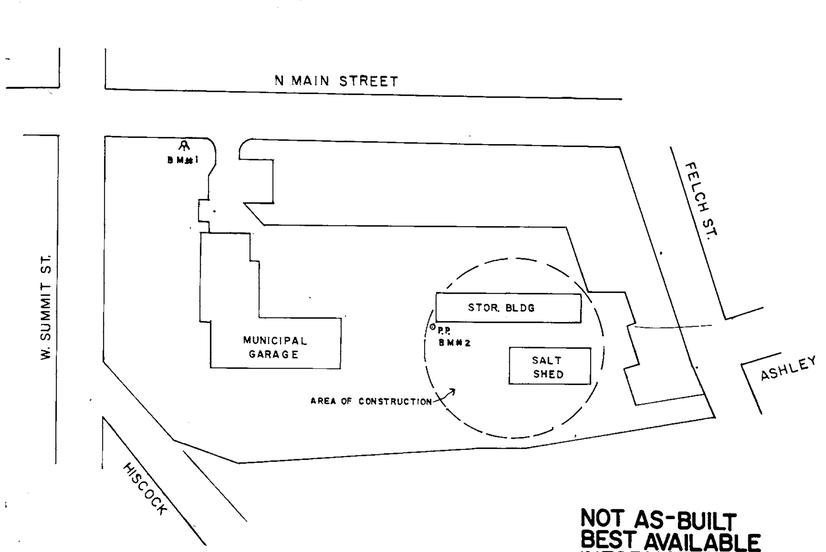
PROJECT
NEW FUEL LINES/CANOPY
CITY OF ANN ARBOR
DEPT. OF PUBLIC WORKS
FILE NAME: 9559DET5
PROJECT No. 9559

SHEET TITLE
CANOPY DETAILS
DATE: 10/26/96

SHEET No.
4
OF 4

1. ALL WORK IS TO CONFORM TO CURRENT CITY OF ANN ARBOR SPECIFICATIONS
2. LOCATION AND DEPTH OF ALL EXISTING UTILITIES ARE TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION
3. MANHOLE COVERS AND FRAMES ARE TO BE EITHER NEENAN R1642 TYPE C OR EJIW 1040 TYPE A, WITH TWO 1" PICK HOLES. COVER IS TO HAVE SEWER CAST IN THE SURFACE.
4. R-1 AND R-2 GRATES ARE TO BE REPLACED WITH EJIW MODEL 5000, TYPE M3 GRATE WITH SIX (6) OPENINGS.
5. R-3 IS TO BE A 2' STRUCTURE WITH FRAME AND GRATE TO BE EITHER NEENAN R-3448-D OR EJIW 5000 TYPE M2
6. VERIFY LOCATION OF COPPER WATER SERVICE PRIOR TO PLACEMENT OF STORM SEWER. RELOCATE SERVICE IF IT CONFLICTS WITH PROPOSED STORM SEWER
7. EXISTING GRAVEL TO BE STOCKPILED ON SITE FOR USE IN AREA TO BE REGRADED
8. CL II BACKFILL IS TO BE USED TO WITHIN 8" OF FINISHED GRADE. IN AREA OF PROPOSED PAVED SURFACE, 22A STONE BACKFILL TO BE USED FROM TOP OF CL II BACKFILL TO FINISHED GRADE. IN AREA TO BE REGRADED, EXISTING GRAVEL TO BE USED FROM TOP OF CL II BACKFILL TO EXISTING GRADE.

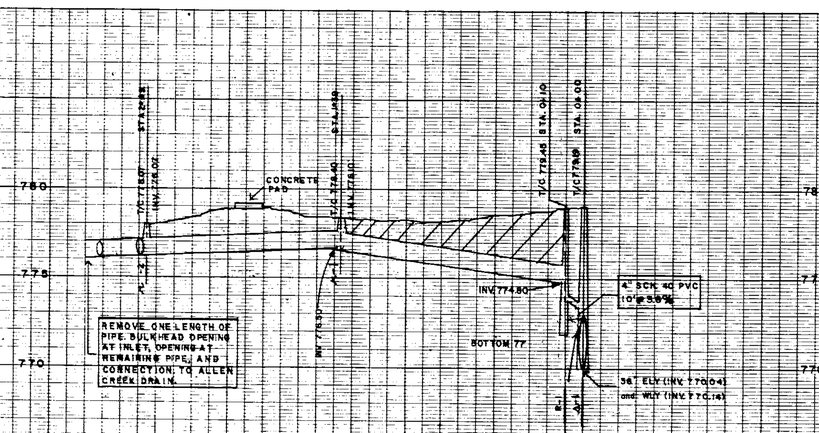


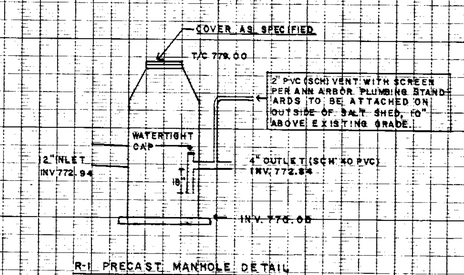


NOT AS-BUILT
BEST AVAILABLE INFORMATION

BENCH MARK #1
STEAMER VALVE ON FIRE HYDRANT
ELEV. 779.10

BENCH MARK #2
BOAT SPIKE IN N.W. SIDE
ELEV. 779.92





R-1 PRECAST MANHOLE DETAIL
(NTS)

GRAPHIC SCALE
no scale
0 1 2

NOTE
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

BENCH MARK	SURVEY BOOK	REV.NO.	DESCRIPTION	DATE	DR.BY	CH.BY
		1	AS BUILT	4/90	A.E.Q	
			ORIGINAL ISSUE	10/87	R.L.W.	

Digital Status
Scanned On: 4/25/05
By: LES

ENGINEERING DEPARTMENT - CITY OF ANN ARBOR

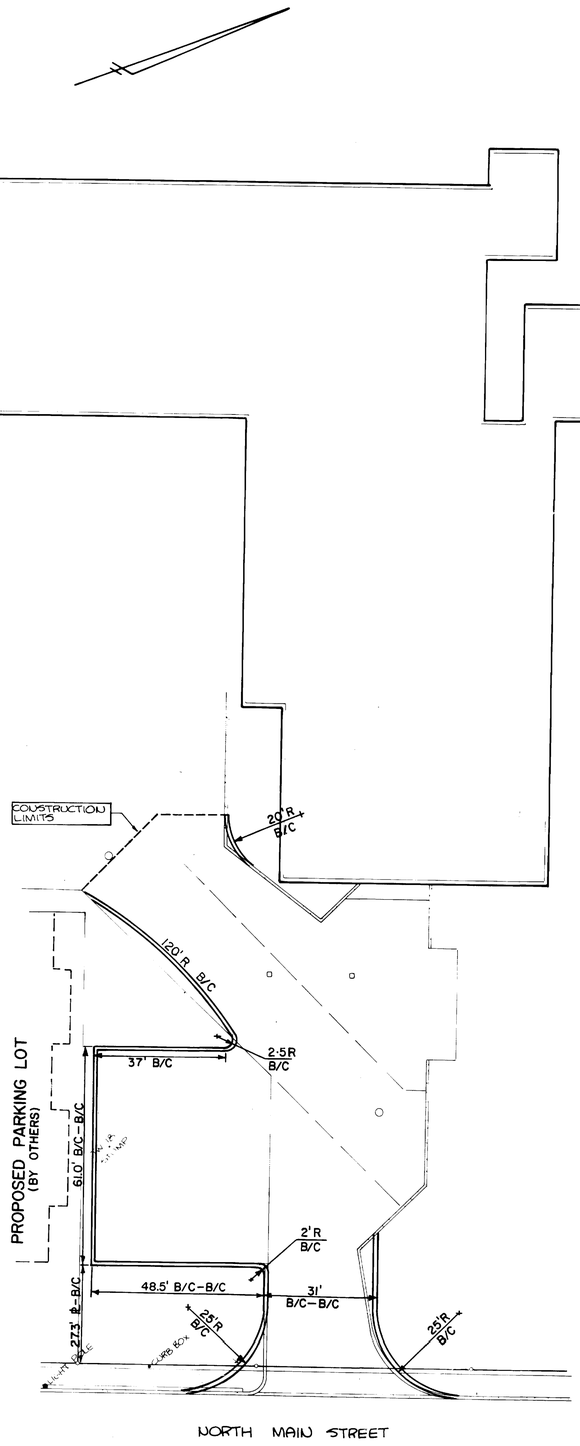
CITY OF ANN ARBOR MUNICIPAL GARAGE
SALT/SAND CONTAINMENT FACILITY

SCALE HORIZONTAL INCH 0 1
VERTICAL

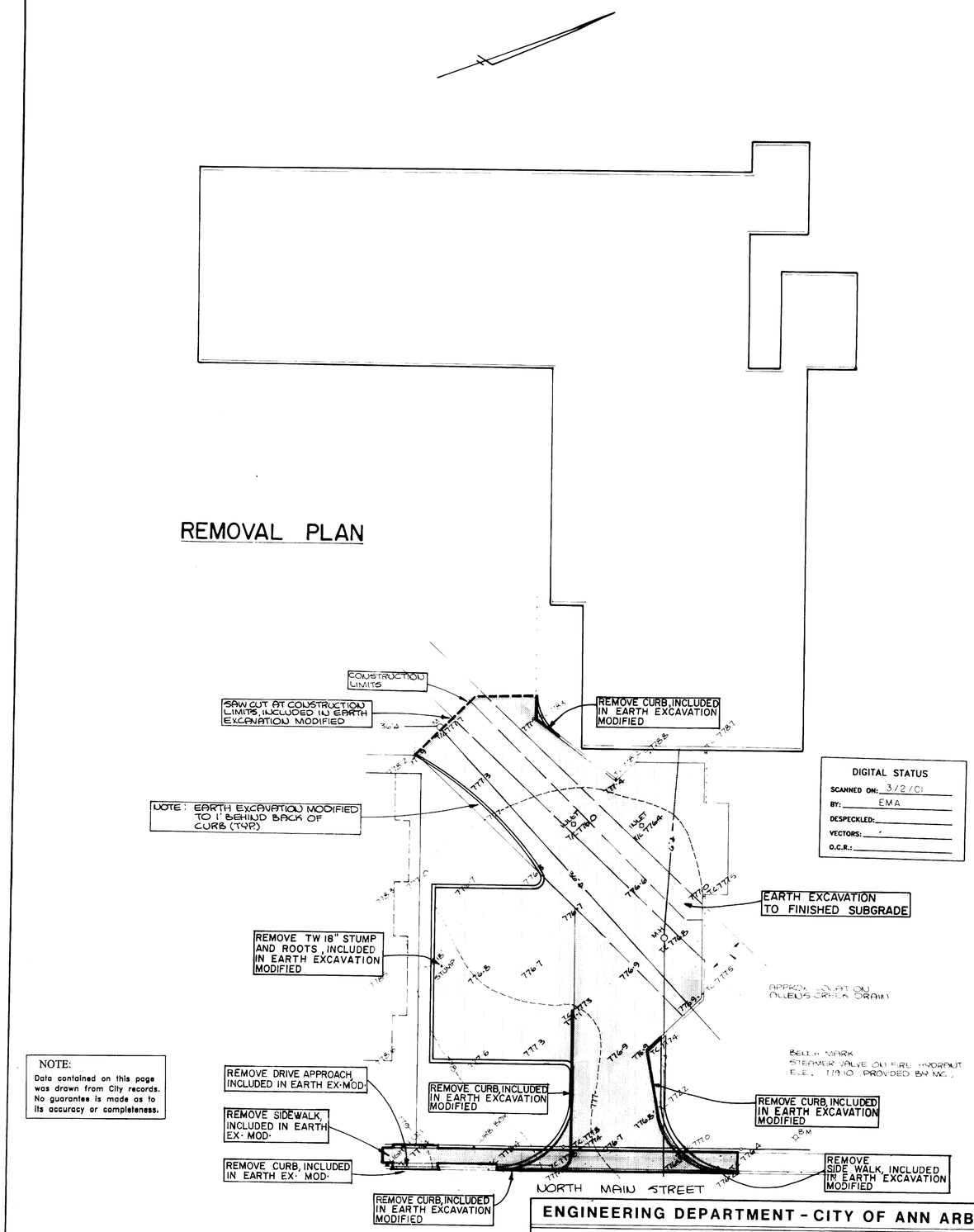
DRAWING NO. 87033-2

SHEET NO. 2 OF 2

LAYOUT PLAN



REMOVAL PLAN



DIGITAL STATUS
SCANNED ON: 3/2/01
BY: EMA
DESPECKLED:
VECTORS:
O.C.R.:

NOTE:
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

Digital Status
Scanned On: 8/22/15
By: LB

BENCH MARK	SURVEY BOOK	NO. OR LETTER	REVISIONS	CH. BY	DR. BY	DATE
			ORIGINALS		JWC III	7-8-87
				AI	GFD	5-1-87

ENGINEERING DEPARTMENT - CITY OF ANN ARBOR

MUNICIPAL GARAGE
DRIVEWAY IMPROVEMENTS
REMOVAL & LAYOUT PLAN
"AS BUILT"

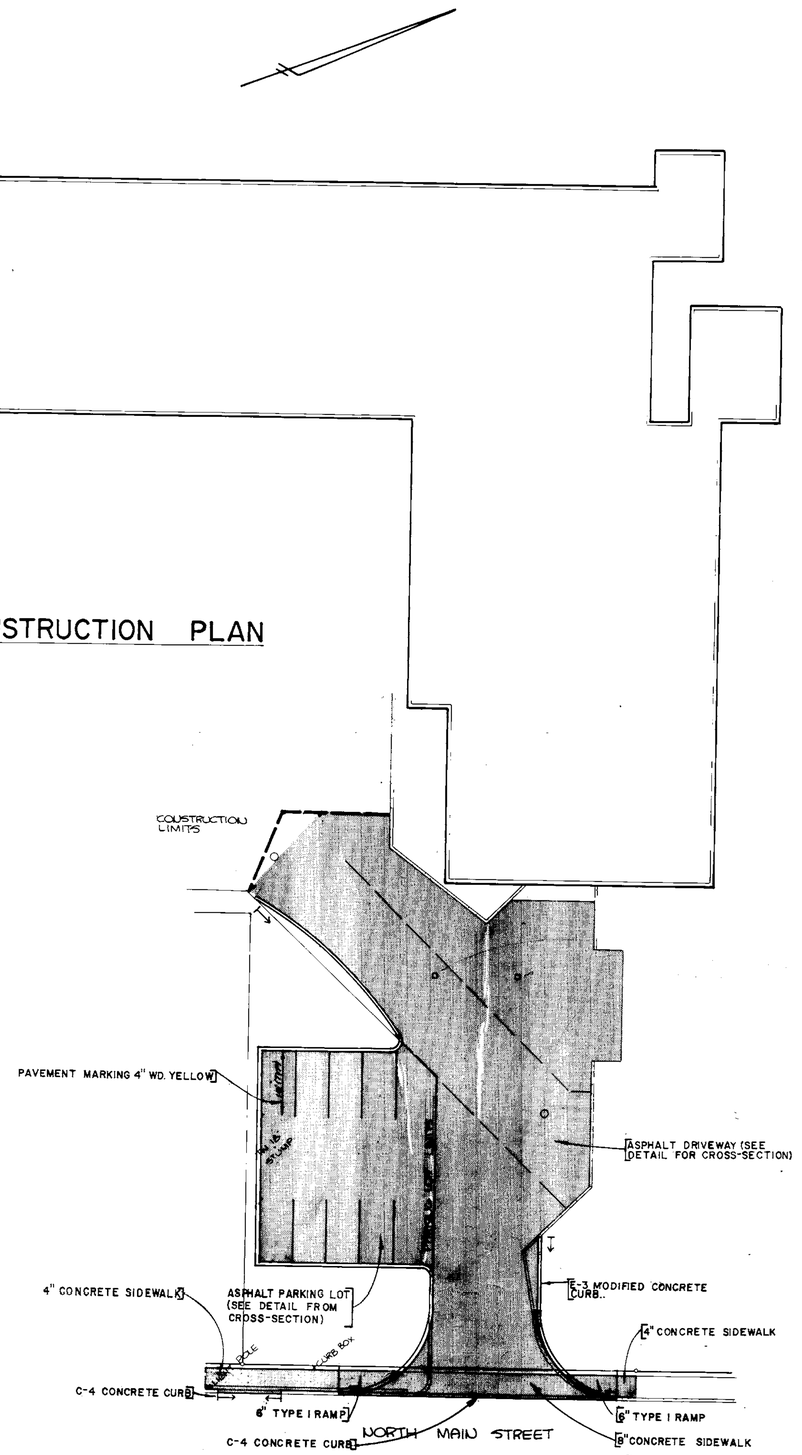
SCALE INCH
1"=20' 0 20'

DRAWING NO.
86007-1

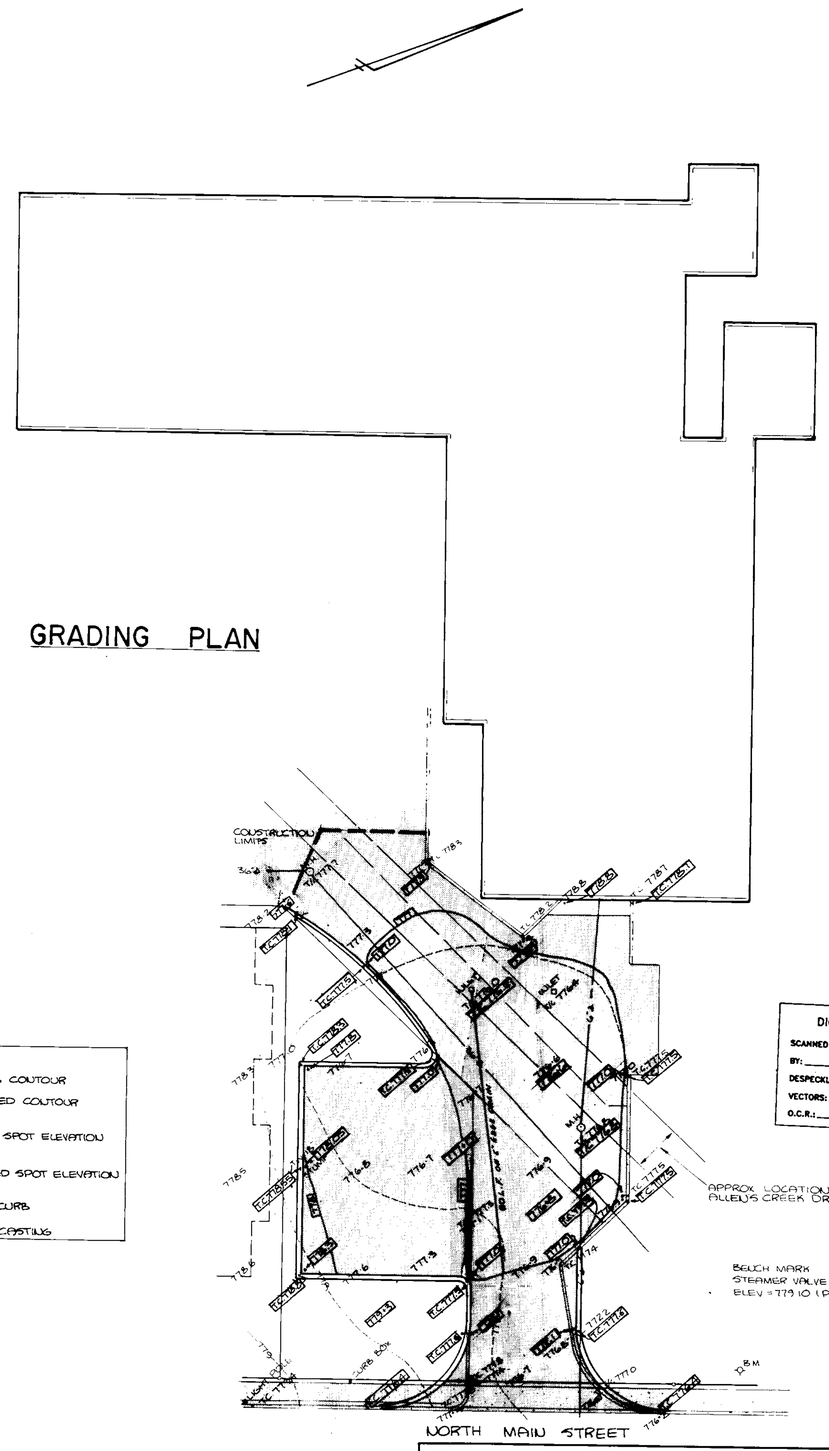
SHEET NO. 1 OF 5

DMI 250 7-84 765HF

CONSTRUCTION PLAN



GRADING PLAN



LEGEND

- 777 : EXISTING CONTOUR
- 777 : PROPOSED CONTOUR
- 777.0 : EXISTING SPOT ELEVATION
- 777.0 : PROPOSED SPOT ELEVATION
- T.C. : TOP OF CURB
- T/C : TOP OF CASTING

NOTE:
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

DIGITAL STATUS
SCANNED ON: 3/2/01
BY: EMA
DESPECKLED:
VECTORS:
O.C.R.:

Digital Status
Scanned On: 2/8/2005
By: LES

BENCH MARK	SURVEY BOOK	NO. OR LETTER	REVISIONS ORIGINALS	CH. BY	DR. BY	DATE
				AI	GFD	5-1-87
				JW.C.JF		7-8-87

ENGINEERING DEPARTMENT - CITY OF ANN ARBOR

MUNICIPAL GARAGE
DRIVEWAY IMPROVEMENTS
CONSTRUCTION & GRADING PLAN
"AS-BUILT"

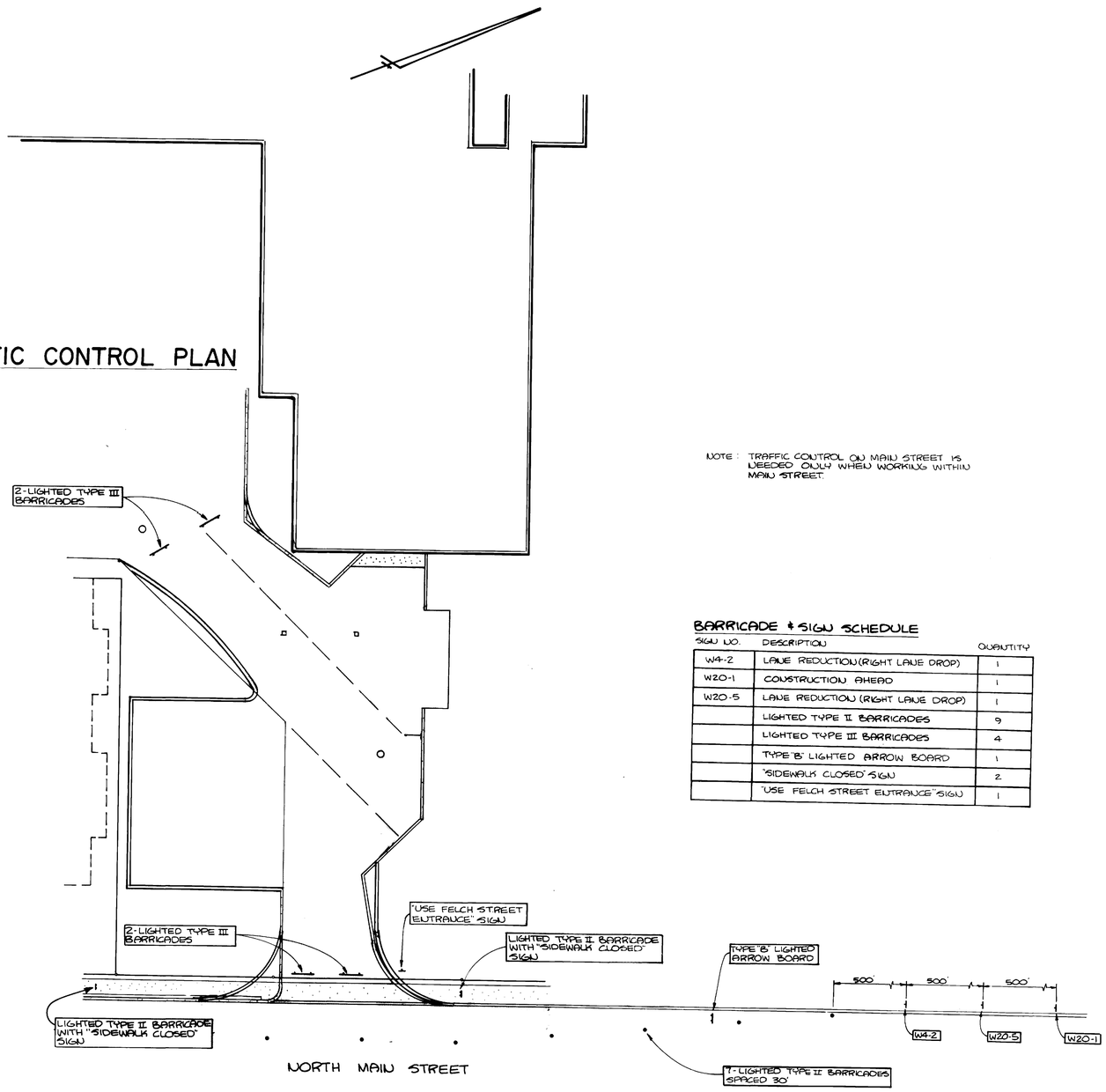
SCALE INCH
1"=20' 0 20'

DRAWING NO. 86007-2

SHEET NO. 2 OF 5

DMI 250 1-84 7656F

TRAFFIC CONTROL PLAN



NOTE: TRAFFIC CONTROL ON MAIN STREET IS NEEDED ONLY WHEN WORKING WITHIN MAIN STREET.

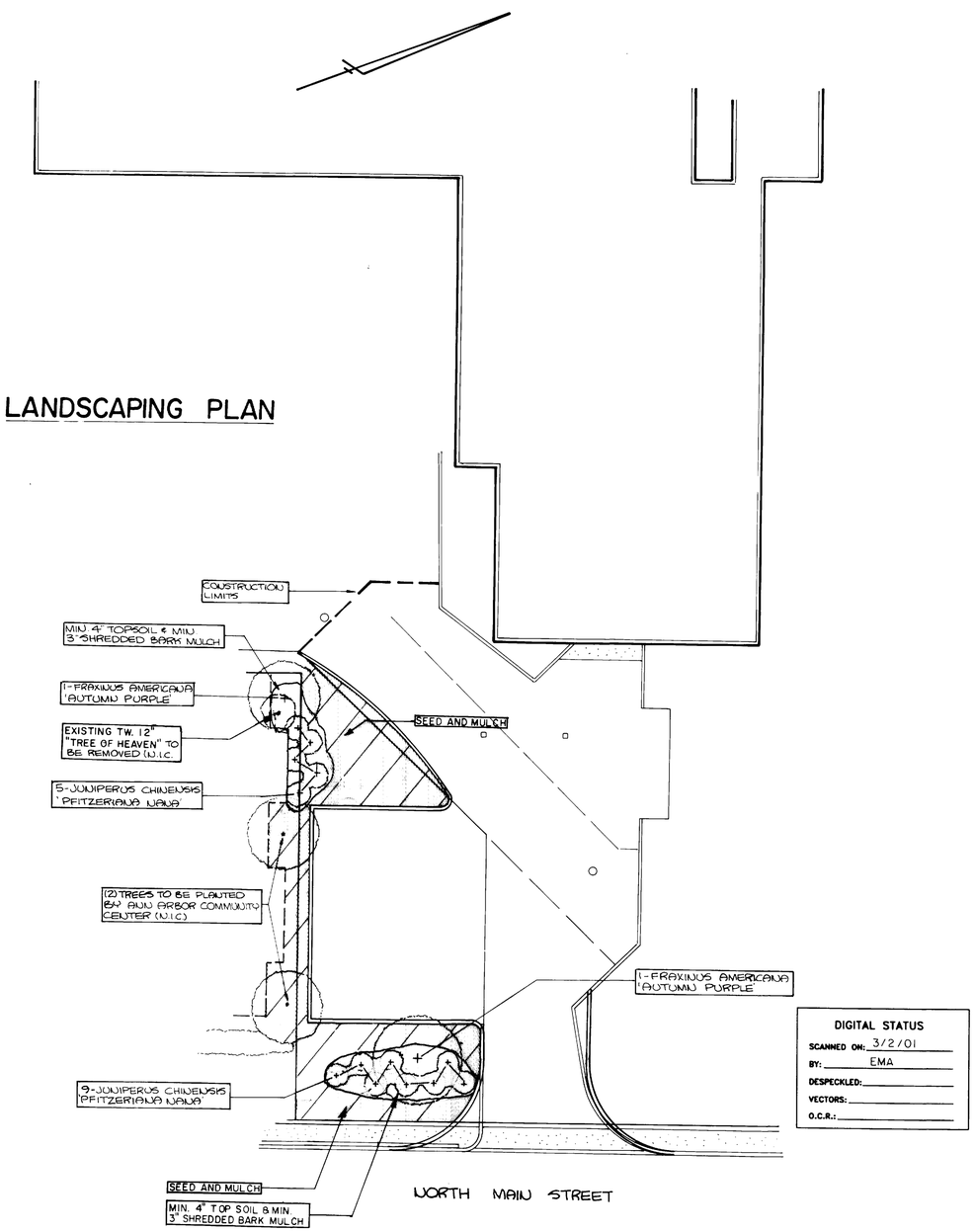
BARRICADE & SIGN SCHEDULE

SIGN NO.	DESCRIPTION	QUANTITY
W4-2	LANE REDUCTION (RIGHT LANE DROP)	1
W20-1	CONSTRUCTION AHEAD	1
W20-5	LANE REDUCTION (RIGHT LANE DROP)	1
	LIGHTED TYPE II BARRICADES	9
	LIGHTED TYPE III BARRICADES	4
	TYPE "B" LIGHTED ARROW BOARD	1
	"SIDEWALK CLOSED" SIGN	2
	"USE FELCH STREET ENTRANCE" SIGN	1

NOTE:
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

Digital Status
Scanned On: 8/18/05
By: LC

LANDSCAPING PLAN



DIGITAL STATUS
SCANNED ON: 3/2/01
BY: EMA
DESPECKLED:
VECTORS:
O.C.R.:

TREE & SHRUB SCHEDULE

SIZE	BOTANICAL NAME	COMMON NAME	QUANTITY
2½"-3" CAL. B.&B.	FRAXINUS AMERICANA 'AUTUMN PURPLE'	AUTUMN PURPLE ASH	2
18"-24" SPD. B.&B.	JUNIPERUS CHINENSIS 'PFITZERIANA' NANA	LOW SPREADING JUNIPER	14

NOTE:
PLANTINGS SHOULD BE PLACED IN BEDS WITH MINIMUM 4" TOPSOIL AND 3" SHREDDED BARK MULCH (INCLUDED IN LANDSCAPING) **PLANTING BED**

SEEDING & MULCH (INCLUDED IN TOPSOILING & SEEDING) GREENBELT AREA

BENCH MARK	SURVEY BOOK	NO. OR LETTER	REVISIONS / ORIGINALS	CH. BY	DR. BY	DATE
					JNG	7-8-87
			ORIGINALS	AI	GFD	5-1-87

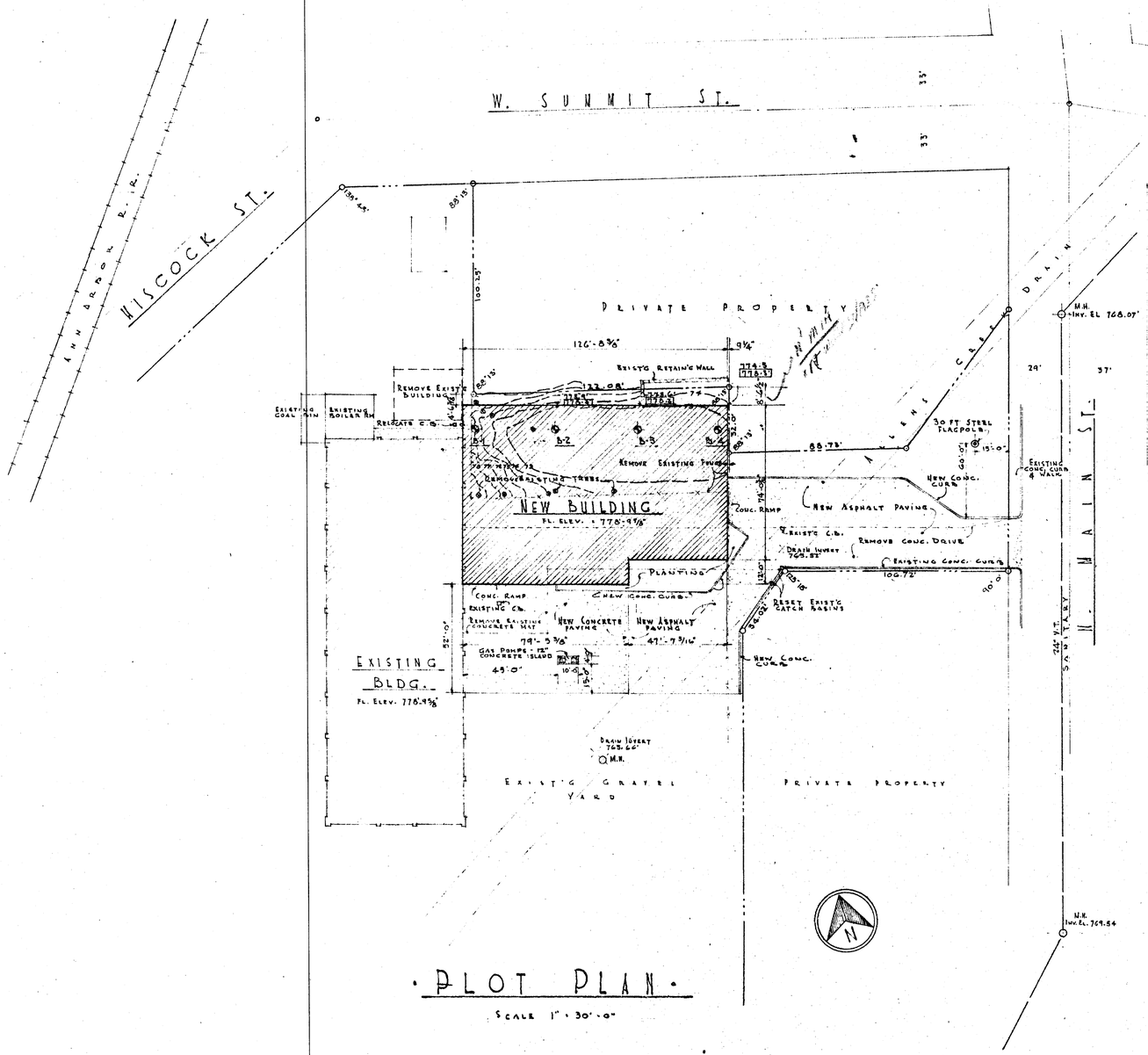
ENGINEERING DEPARTMENT - CITY OF ANN ARBOR

MUNICIPAL GARAGE
DRIVEWAY IMPROVEMENTS
LANDSCAPING & TRAFFIC CONTROL PLAN
"AS-BUILT"

SCALE 1"=20' | INCH 0 20'

DRAWING NO. 86007-5

SHEET NO. 5 OF 5

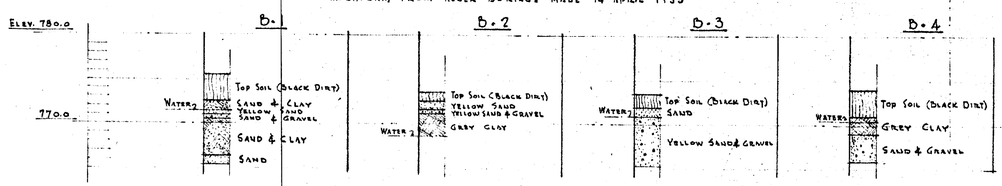


· PLOT PLAN ·

SCALE 1" = 30'-0"

· TEST BORINGS ·

FROM DATA COMPILED BY CITY ENGINEER'S OFFICE, ANN ARBOR MICHIGAN, FROM AUGER BORING'S MADE 14 APRIL 1955



INDEX OF DRAWINGS

SHEET NO. 1 PLOT PLAN · TEST BORINGS
2 FINISH SCHEDULE · DOOR SCHEDULE
3 FIRST FLOOR PLAN
3A "SECOND FLOOR" & MEZZ. PLANS UPDATE
4
5 ELEVATIONS & SECTIONS
6 WALL SECTIONS & DETAILS
7 WALL SECTIONS & DETAILS AT EXISTING BLDG.
8 STAIRS & VESTIBULE DETAILS

S-1 FOUNDATION PLAN · DETAILS
S-2 SECOND FLOOR & ROOF FRAMING
S-3 SCHEDULES & TRUSS DIAGRAMS

M-1 HEATING LAYOUTS
M-2 WATER SUPPLY
M-3 PLUMBING & DRAINAGE PLANS

E-1 ELECTRICAL PLANS & DIAGRAMS

NOTE:
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NOT AS-BUILT, BEST AVAILABLE INFO.

GRAPHIC SCALE
TWO INCHES
0 1 2

PROJECT
ADDITIONS & ALTERATIONS TO
MUNICIPAL GARAGE
721 NORTH MAIN ST. · ANN ARBOR · MICHIGAN

CLIENT
THE CITY OF
ANN ARBOR
MICHIGAN

ARCHITECT
DOUGLAS D. LOREE
120 N. 4TH AVE. ANN ARBOR

DATE	ISSUED FOR	REV	BUL
7/12/57	BIDDING		

SHEET 1

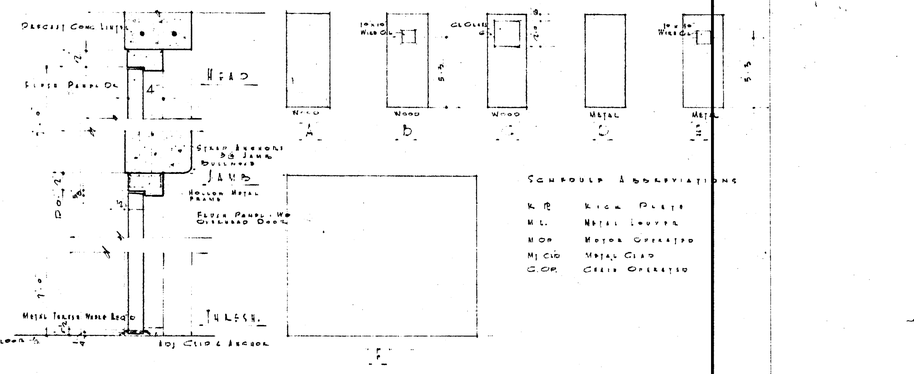
6-C-5621

SCHEDULE OF INTERIOR FINISHES

FLOOR	RM NUMBER	ROOM	CEILING CONSTRUCTION: EXPOSED STEEL & CONCRETE; EXPOSED WOOD; EXPOSED TILE	FLOOR MATERIAL: FURNISHED CONCRETE; WOOD; WATERPROOFING	FLOOR FINISH: REQUIREMENT TILE; UNFURNISHED	BASE CONSTRUCTION: EXISTING CONSTRUCTION; EXPOSED CONC. MASONRY; CONC. BLOCK; BRICK MASONRY; NO BASE; CERAMIC TILE	BASE MATERIAL: UNFURNISHED; PAINTED	WALLS & PART'NS MATERIAL: EXPOSED CONSTRUCTION	CEILING MATERIAL: UNFURNISHED; FACTORY FIN.; PAINTED	REMARKS
FIRST FLOOR	101	VESTIBULE	●	●	●	●	●	●	●	
	102	LAVATORY	●	●	●	●	●	●	●	
	103	STORAGE	●	●	●	●	●	●	●	
	104	GAS ATTD'NT	●	●	●	●	●	●	●	
	105	REPAIR AREA	●	●	●	●	●	●	●	LATH & PLASTER EXPOSED CEILING BMS.
	106	SERVICE MANAGER	●	●	●	●	●	●	●	
	107	STOCK ROOM	●	●	●	●	●	●	●	
	108	TIRE STORAGE	●	●	●	●	●	●	●	
	109	REPAIR AREA	●	●	●	●	●	●	●	
	110	PAINT ROOM	●	●	●	●	●	●	●	
	111	WASH AREA	●	●	●	●	●	●	●	LATH & PLASTER EXPOSED CEILING BMS.
	112	POLICE RADIO	●	●	●	●	●	●	●	
SECOND FLOOL	201	HALL	●	●	●	●	●	●	●	
	202	JANITOR	●	●	●	●	●	●	●	
	203	TOILET ROOM	●	●	●	●	●	●	●	
	204	LUNCH AREA	●	●	●	●	●	●	●	
	205	LOCKERS	●	●	●	●	●	●	●	
	206	OFFICE AREA	●	●	●	●	●	●	●	
	207	STAIR #1	●	●	●	●	●	●	●	METAL STAIR CONST'N - SEE DET SHT # 8
	208	STAIR #2	●	●	●	●	●	●	●	METAL STAIR CONST'N - SEE DET SHT # 8

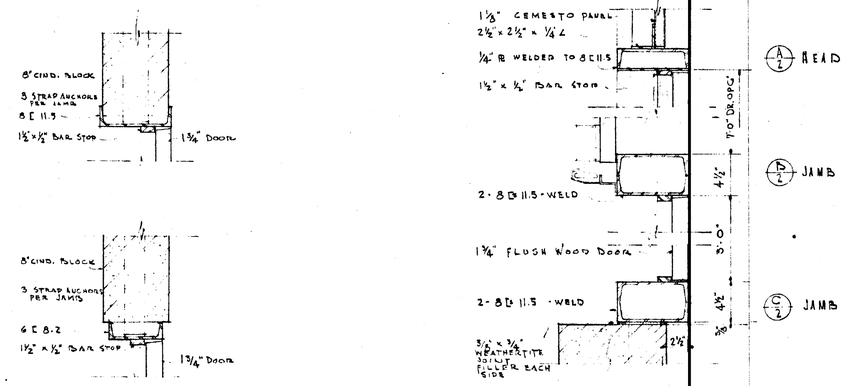
DOOR SCHEDULE

NO.	ROOM		OPENING	THICK	TYPE	FRAME	THRESH.	DET SH	REMARKS
101	VESTIBULE	101	3'-0" x 7'-0"	1¾	A	MET.	ALUM	8	KAWNEER FRAME: SEE SHEET # 8
102	GAS ATTDNT	104	3'-0" x 7'-0"	1¾	A	MET.	ALUM	8	KAWNEER FRAME: SEE SHEET # 8
103	GAS ATTDNT	104	2'-8" x 7'-0"	1¾	C	MET.			K.R.
104	GAS ATTDNT	104	2'-8" x 7'-0"	1¾	D	MET.			A" LABEL K.R.
105	LAVATORY	102	2'-6" x 7'-0"	1¾	A	MET.			K.R.
106	VESTIBULE	101	3'-0" x 7'-0"	1¾	D	MET.			A" LABEL K.R.
107	STORAGE	103	3'-0" x 7'-0"	1¾	D	MET.			A" LABEL
108	SERVICE MNGR	106	2'-8" x 7'-0"	1¾	C	MET.			K.R.
109	SERVICE MNGR	106	2'-0" x 7'-0"	1¾	D	MET.			A" LABEL
110	STOCK ROOM	107	2'-2 6/8" x 7'-0"	1¾	D	WOOD			A" LABEL K.R.
111	STAIR #2	208	2'-8" x 7'-0"	1¾	D	MET.			A" LABEL
112	REPAIR AREA	109	3'-0" x 7'-0"	1¾	A	SC	ALUM	7	
113	TIRE STOR	108	3'-0" x 7'-0"	1¾	D	MET.			A" LABEL K.R.
114	REPAIR AREA	109	14'-0" x 12'-0"	1¾	F	SC		7	M.OP.
115	PAINT ROOM	110	12'-0" x 12'-0"	1¾	F	SC			
116	REPAIR AREA	109	14'-0" x 12'-0"	1¾	F	SC		7	A"LABEL - M.CLG M.OP.
117	WASH AREA	111	14'-5⅝" x 14'-0"	1¾	F	SC		7	
118	EXISTING BLDG					SC			M.OP.
119	~~EXISTING BLDG~~		~~14'-0" x 12'-0"~~	1¾	F	SC			M.OP.
120	EXISTING BLDG		3'-0" x 7'-0"	1¾	A	SC	ALUM		
121	STOCK ROOM	107	3'-4" x 3'-0"						ROLLING STEEL DOOR "A" LABEL
122	PAINT ROOM	110	2'-8" x 7'-0"	1¾	A	MET.			
201	STAIR #2	208	2'-8" x 7'-0"	1¾	F	MET			"B" LABEL
202	TOILET ROOM	203	2'-8" x 7'-0"	1¾	A	MET			K.R.
203	JANITOR	202	2'-4" x 7'-0"	1¾	A	MET			
204	LOCKERS	205	2'-8" x 7'-0"	1¾	A	MET			K.R.
205	LUNCH AREA	204	2'-8" x 7'-0"	1¾	B	MET			K.R.



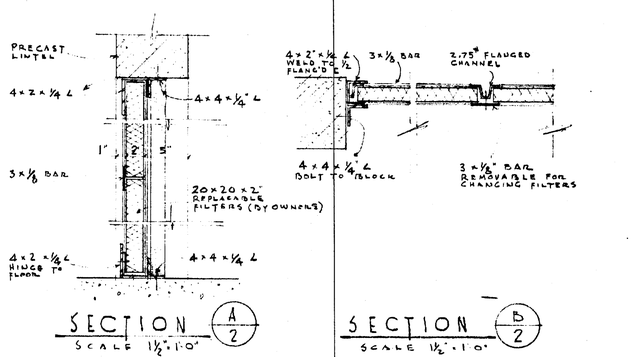
• TYP. HOLLOW MET. DOOR FR. DET. •
SCALE 1½" = 1'-0"

DOOR TYPES
NO SCALE



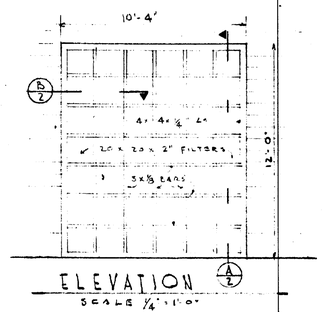
• TYP. STEEL CHANNEL DOOR FRAME DET. •
SCALE 1½" = 1'-0"

DETAILS • DOOR Nº 112
SCALE 1½" = 1'-0"



SECTION A/2
SCALE 1½" = 1'-0"

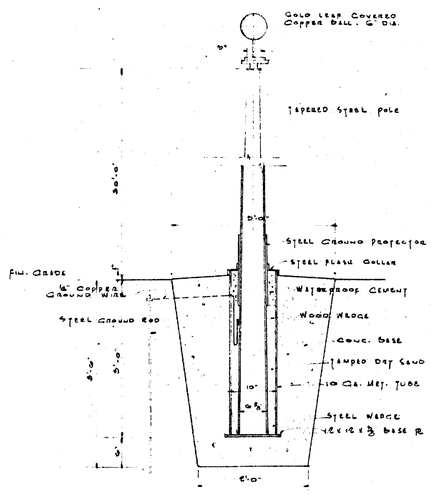
SECTION B/2
SCALE 1½" = 1'-0"



ELEVATION A/2
SCALE ¼" = 1'-0"

NOTE: FILTER RACK IS TO BE BY MISC. METALS CONTRACTOR - FILTERS FURNISHED BY OWNER.

• FILTER RACK DETAILS •



• FLAGPOLE DETAIL •
SCALE ½" = 1'-0"

NOTE:
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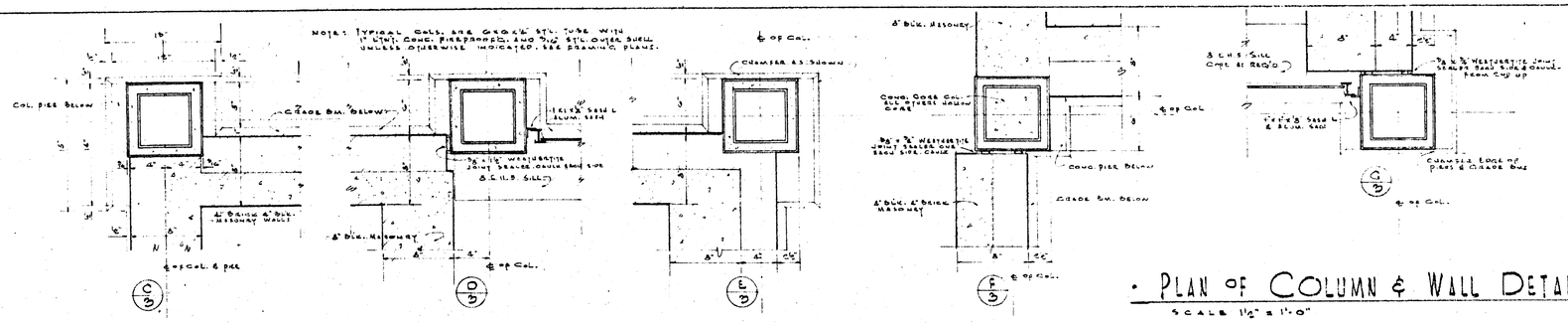
GRAPHIC SCALE
TWO INCHES
0 1 2

NOT AS-BUILT, BEST AVAILABLE INFO.

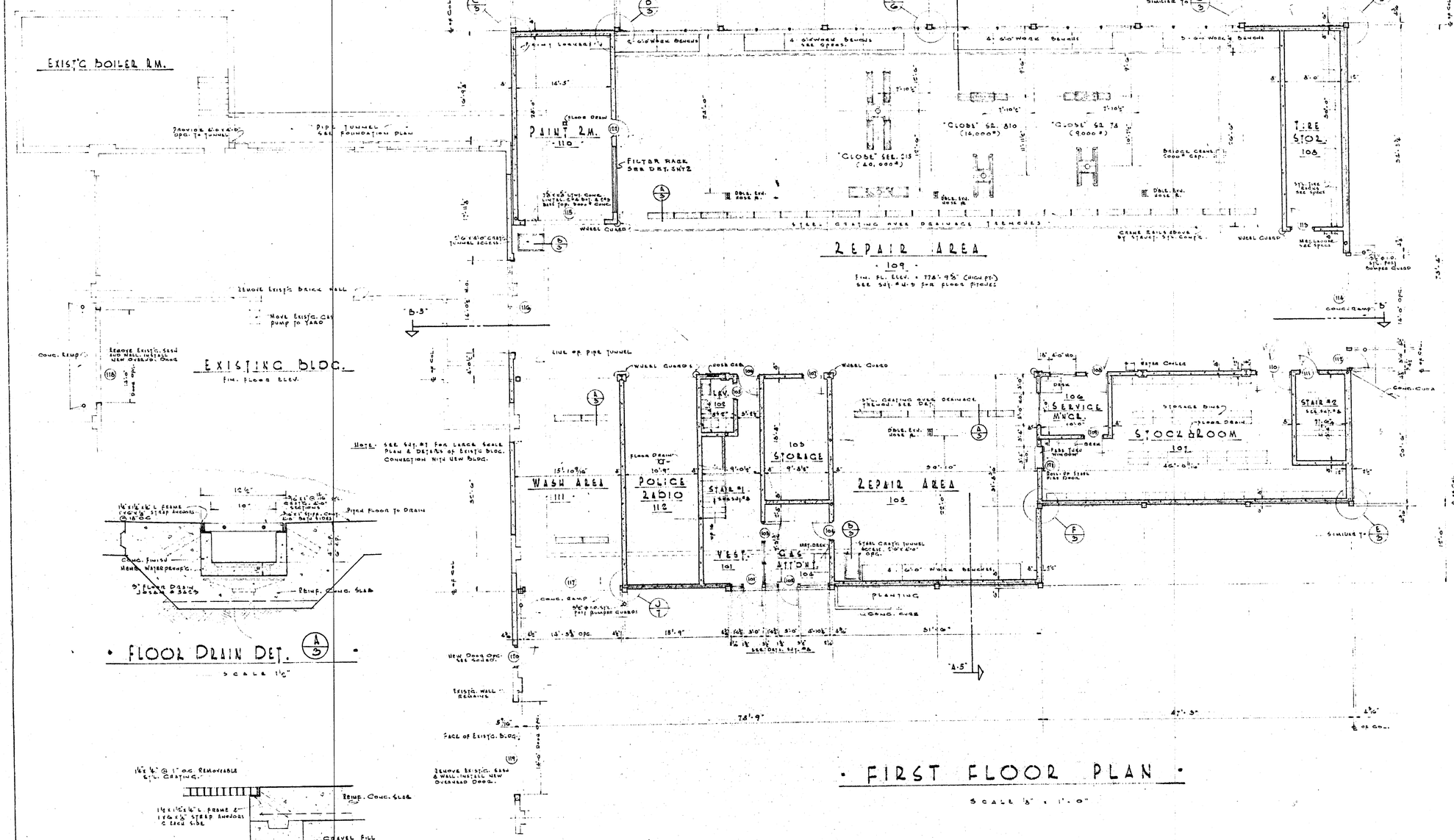
PROJECT	CLIENT	ARCHITECT	DATE	ISSUED FOR	REV	BUL	SHEET
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST. ANN ARBOR · MICHIGAN	THE CITY OF ANN ARBOR MICHIGAN.	DOUGLAS D. LOREE 120 N 4TH AVE · ANN ARBOR	7/12/51	BIDDING			2

6-C-5621



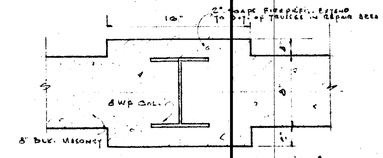
· PLAN OF COLUMN & WALL DETAILS ·

SCALE 1½" = 1'-0"



· FIRST FLOOR PLAN ·

SCALE ⅛" = 1'-0"

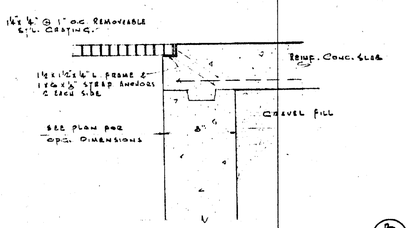


· INTERIOR COL. FIREPR'F'G. DET. ⊖

SCALE 1"

· FLOOR DRAIN DET. (A/3) ·

SCALE 1½"



· PIPE TUNNEL GRATING DET. (B/3) ·

NOT AS-BUILT, BEST AVAILABLE INFO.

NOTE:
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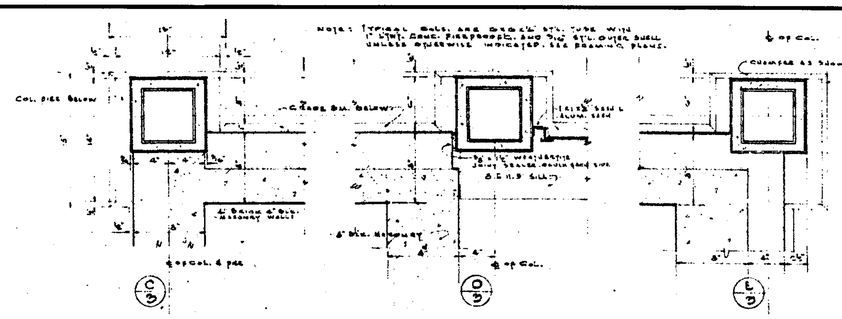
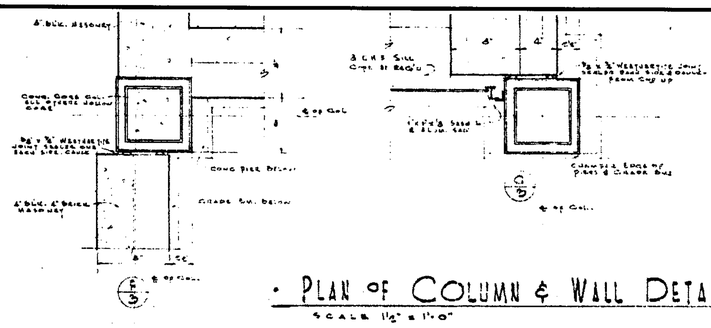
GRAPHIC SCALE
TWO INCHES
0 1 2

PROJECT	CLIENT	ARCHITECT	DATE	ISSUED FOR	REV	BUL	SHEET
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST. · ANN ARBOR · MICHIGAN	THE CITY OF ANN ARBOR MICHIGAN	DOUGLAS D. LOREE 190 E. 4TH AVE. ANN ARBOR	7/12/57	BIDDING			3

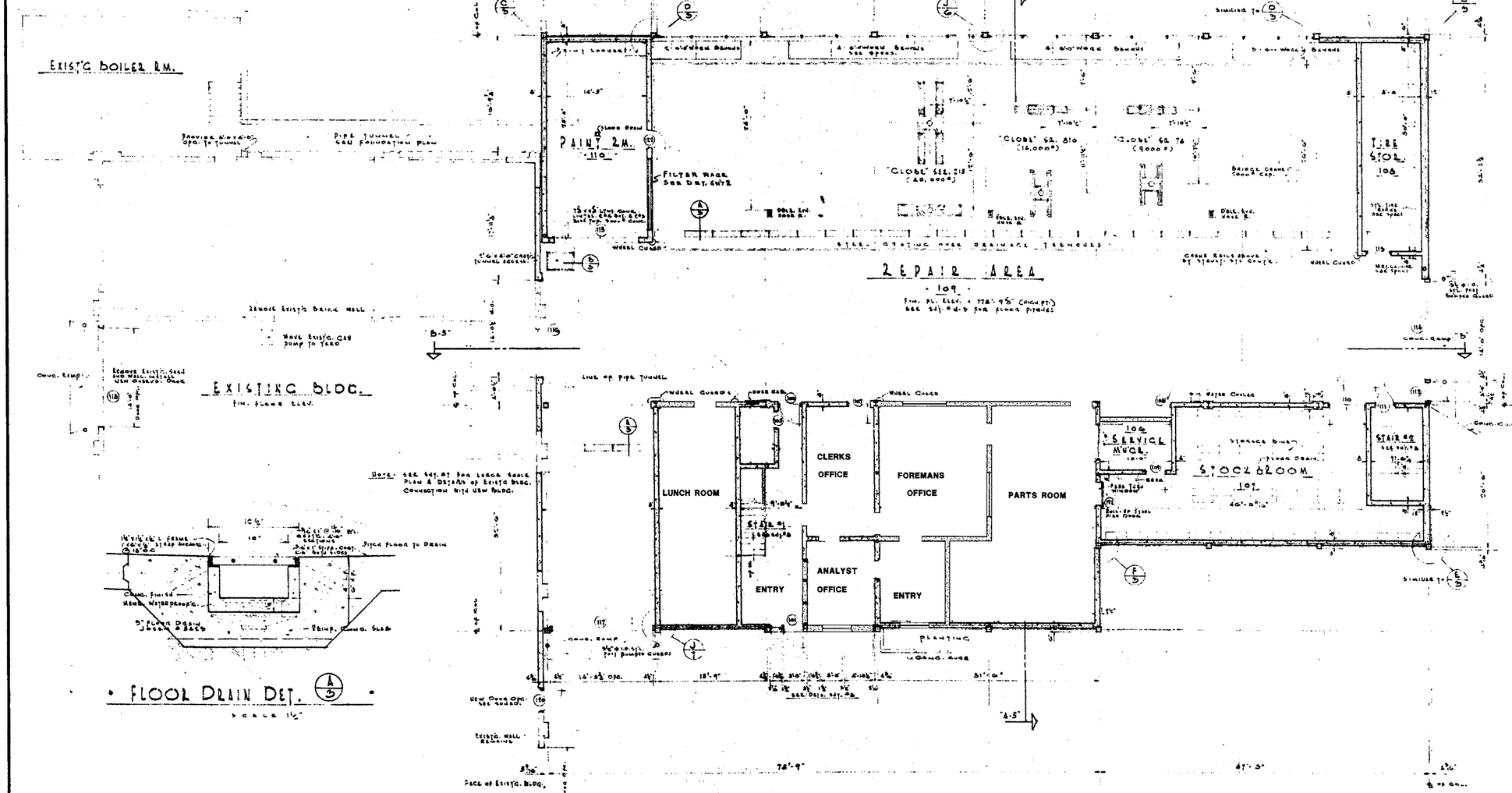
6-C-5621





· PLAN OF COLUMN & WALL DETAILS ·

SCALE 1½" = 1'-0"

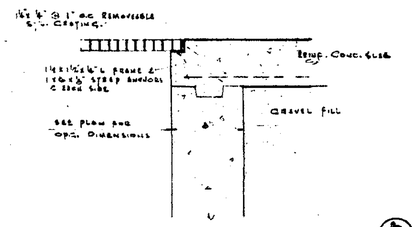


· FIRST FLOOR PLAN ·

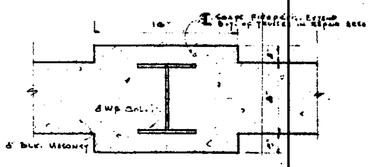
NO SCALE

· FLOOR DRAIN DET. (A/5) ·

SCALE 1½"



· PIPE TUNNEL GRATING DET. (B/5) ·



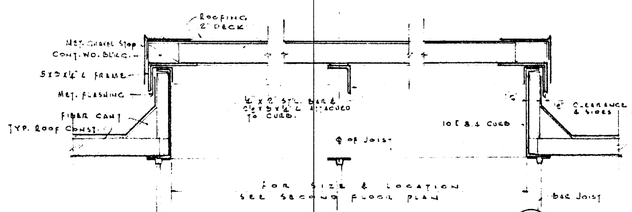
· INTERIOR COL. FIREPROF'G. DET. (C/5) ·

SCALE 1½"

UPDATED 05-01

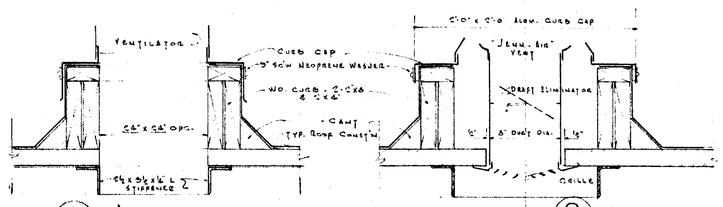
PROJECT	CLIENT	ARCHITECT	DATE ISSUED FOR	BY	DATE	SHEET
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST. · ANN ARBOR · MICHIGAN	THE CITY OF ANN ARBOR MICHIGAN	DOUGLAS D. LOREE 120 E. 4TH AVE. ANN ARBOR	7/25/51 BIDDING			3A

6-C-5621



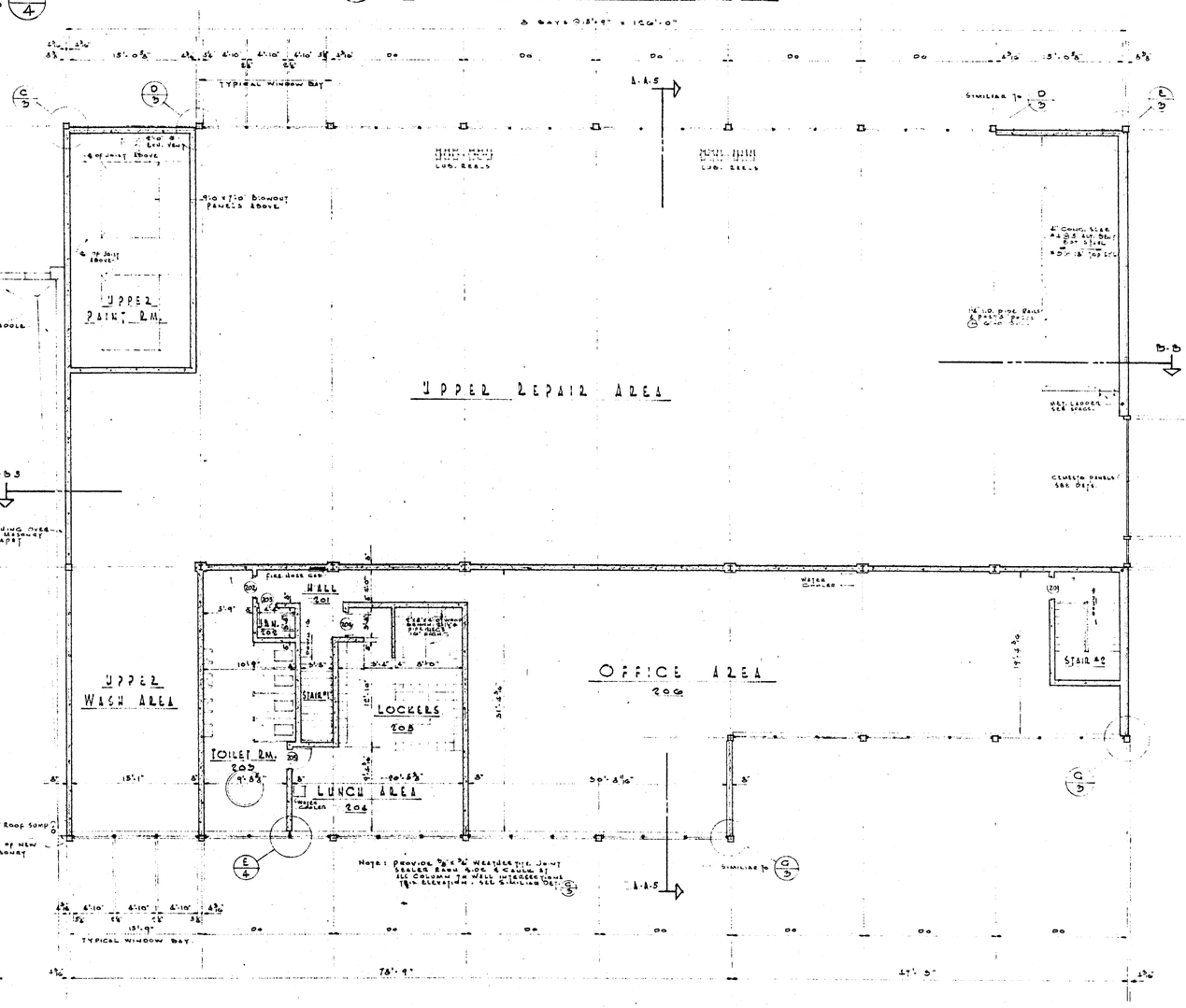
BLOW-OUT PANEL DETAIL (A/4)

SCALE 1½" = 1'-0"



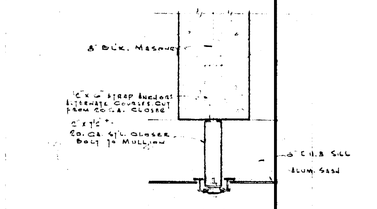
(B/4) ROOF VENT CURB DET'S. (C/4)

SCALE 1½" = 1'-0"



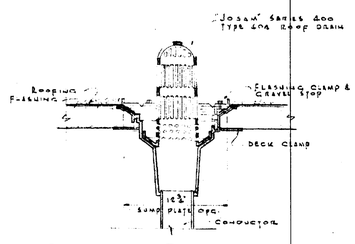
SECOND FLOOR & MEZZANINE PLAN

SCALE ⅛" = 1'-0"



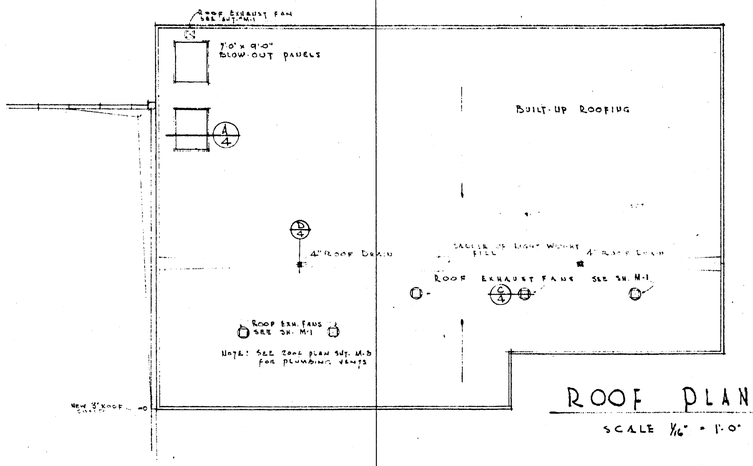
WALL CLOSER DET. (E/4)

SCALE 1½" = 1'-0"



ROOF DRAIN DETAIL (D/4)

NO SCALE



ROOF PLAN

SCALE 1/16" = 1'-0"

EXISTING ROOF

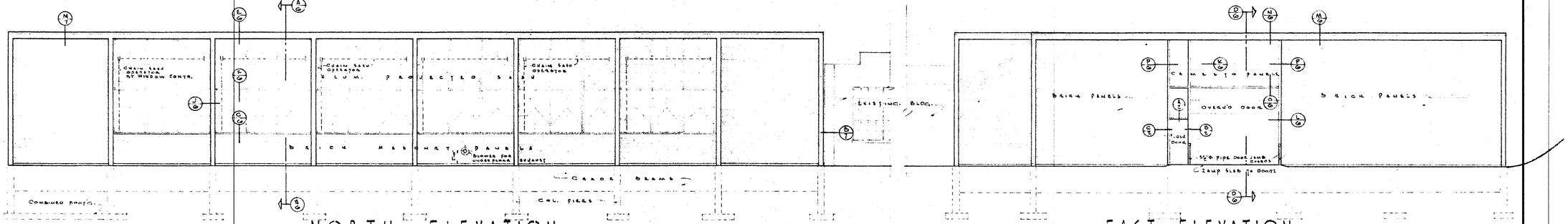
NOT AS-BUILT, BEST AVAILABLE INFO.

NOTE:
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

GRAPHIC SCALE
TWO INCHES
0 1 2

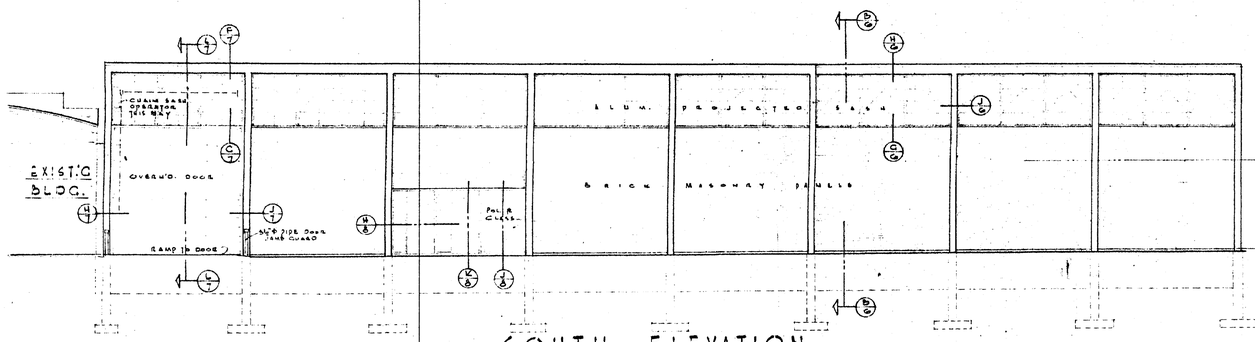
PROJECT	CLIENT	ARCHITECT	DATE	ISSUED FOR	REF.	BUL.	SHEET
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST. · ANN ARBOR·MICHIGAN	THE CITY OF ANN ARBOR MICHIGAN	DOUGLAS D. LOREE 120 N. 4TH. AVE. ANN ARBOR	7/12/57	BIDDING			4

6-C-5621

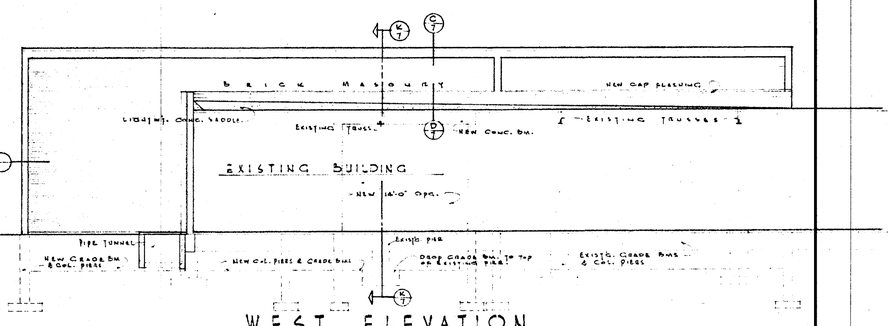


NORTH ELEVATION

EAST ELEVATION

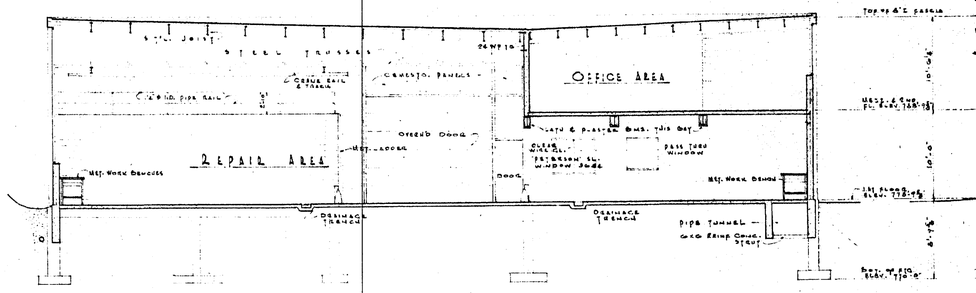


SOUTH ELEVATION

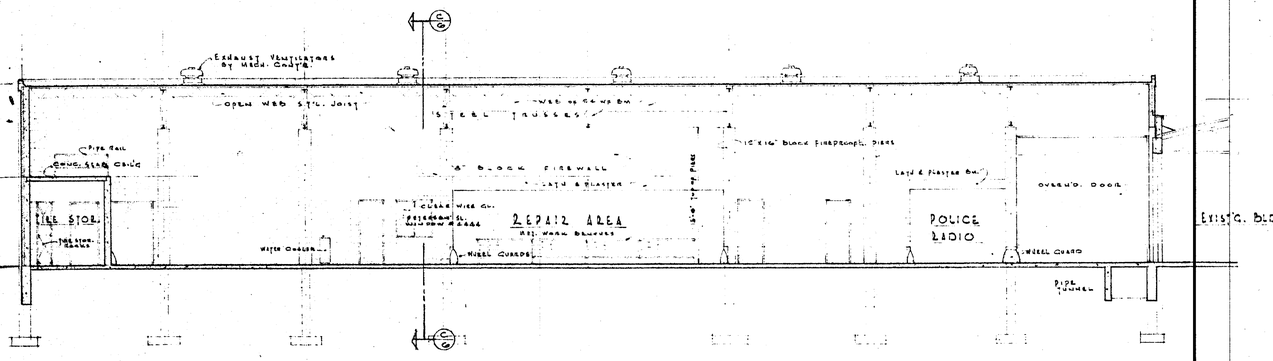


WEST ELEVATION

SCALE ⅛" = 1'-0"



- SECTION "A-A



- SECTION B-B

SCALE ⅛" = 1'-0"

NOT AS-BUILT, BEST AVAILABLE INFO.

GRAPHIC SCALE
TWO INCHES
0 1 2

NOTE:
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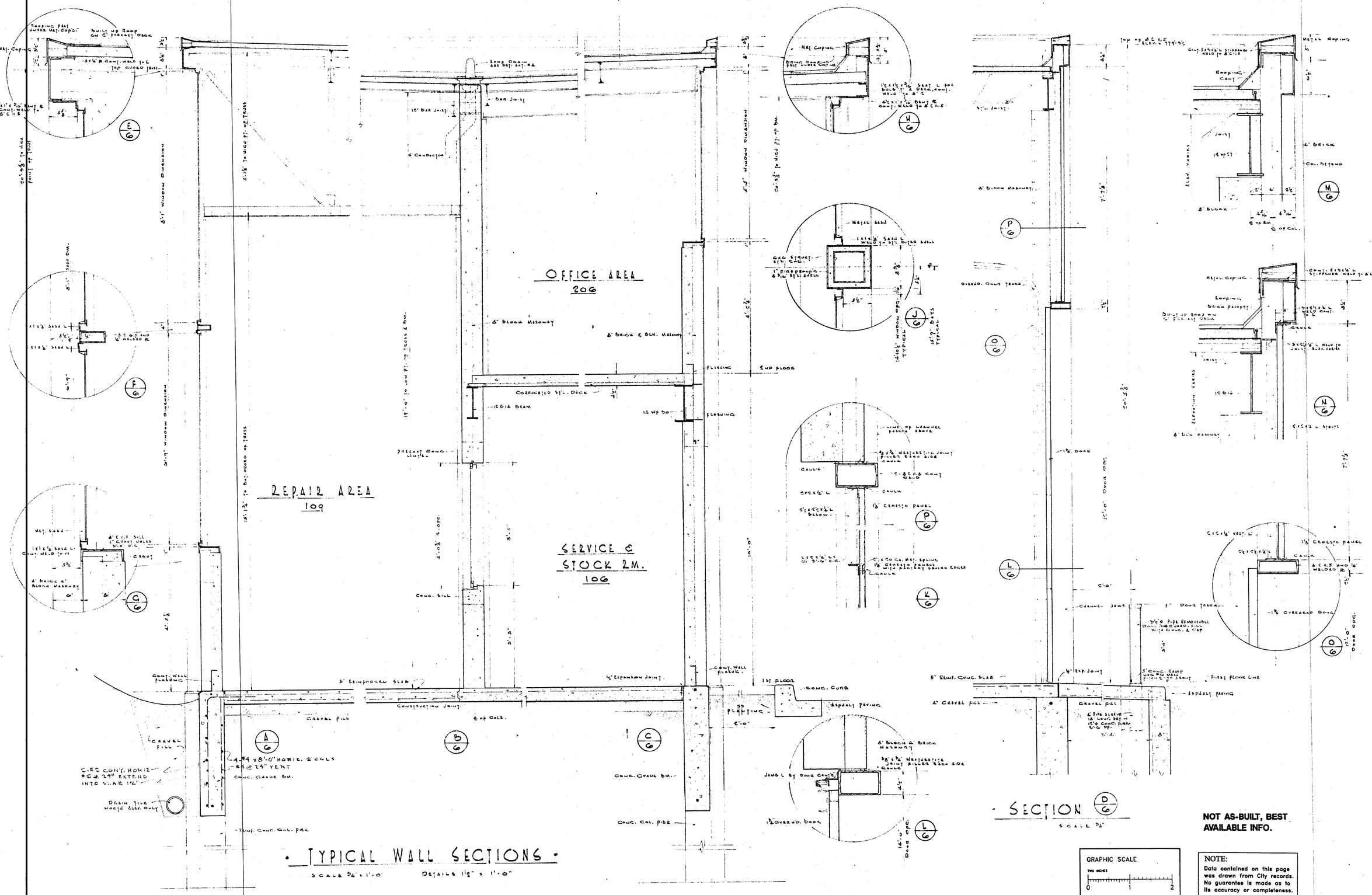
PROJECT	CLIENT	ARCHITECT	DATE	ISSUED FOR	REV	APPL
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST. · ANN ARBOR · MICHIGAN	THE CITY OF ANN ARBOR MICHIGAN	DOUGLAS D. LOREE 120 N. 4TH. AVE · ANN ARBOR	7/12/57	BIDDING		

SHEET 5

6-C-5621



· TYPICAL WALL SECTIONS ·

SCALE 3/4" = 1'-0" DETAILS 1 1/2" = 1'-0"

· SECTION ·

SCALE 3/4"

NOT AS-BUILT, BEST AVAILABLE INFO.

GRAPHIC SCALE
TWO INCHES
0 1 2

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PROJECT	CLIENT	ARCHITECT
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST. ANN ARBOR · MICHIGAN	THE CITY OF ANN ARBOR MICHIGAN	DOUGLAS D. LOREE 120 W. 4TH. AVE. ANN ARBOR

DATE	ISSUED FOR	REV.	BUL.
7/12/57	BIDDING		

SHEET 6

6-G-5621

PAINT RM.

REMOVE EXIST'G PIER

KEEP 1½" CAVITY FREE OF LOOSE MORTAR

REMOVE EXIST'G DOOR, FRAME & SILL. PATCH OPNG. WITH 8" BLOCK MASONRY

REMOVE EXIST'G OFFICE & TOILET ROOM

16"x16" SOLID CONC. BLOCK PIER

EXIST'G COL. & PIERS REMAIN

PATCH EXIST'G. DOOR OPNG. WITH 8" BLOCK MASONRY

EXIST'G BLDG.

WASH AREA

PARTIAL PLAN of EXIST'G. BLDG. & NEW BLDG.

SCALE ⅛" = 1'-0"

8" BRICK MASONRY

8" BLOCK MASONRY

8"x8"x⅝" ℄ COL.

3"x3"x¼" CLOSED L FLOOR TO BOT. OF NEW WALL WELDED TO EXIST'G. BLDG. ONLY.

LINE OF EXIST'G. BLDG.

℄ of COLS.

DW. BLKG. JAMB

ELEVATION VARIES 5'-4½" TO TOP OF

TOP OF EXIST'G. PRECAST BITTUMS

NEW 8" BLOCK

LT. WT. CONC. FILL

CUT EXIST'G. MET. DECK & REMOVE FASC & GUTTER

3"x3"x¼" CLOSED L

EXISTING TRUSS

NEW CONC. BM. POURED AGAINST ANGLE AS SHOWN AND 4" DEEP INTO EXIST'G. TRUSS

REMOVE EXIST'G GUSSET PLATE & CLIP L'S TO BOT. OF TRUSS

REMOVE EXIST'G. LINTEL & MASONRY

3"x3"x¼" JAMB L

12'-0" DOOR OPNG.

REMOVE EXIST'G. SASH, SILL & MASONRY WALL

CAST IRON WHEEL GUARD

EXIST'G. GRADE DW.

EXIST'G. COL. PIER

4'-0"

• PIPE TUNNEL •

6" TAMPED GRAVEL

TRUE GRADE DW. TO ELEV. OF TOP OF EXIST'G. COL. PIER FOOTG.

CONC. STRUT 1'-0" DIA. 8'-0" O.C.

• SECTION K/7 •

SCALE ¾"

℄ of NEW COLS.

RUBBER CONTROL JOINT

CAULK

4" BRICK, 8" BLOCK NEW MASONRY WALL

EXIST'G. BRICK PIER TO BE REMOVED

20 OZ. COPPER WATERSTOP SET IN MORTAR

LINE of EXIST'G BLDG.

LINE of NEW BLDG.

METAL COPING

ROOFING

8" CH.S FASCIA

2" DECK

ELEVATION TO TOP OF 10 WF 36 VARIES

℄ of COLS.

LINE of EXIST'G BLDG.

LINE of NEW BLDG.

MET. CAP FLASHING AS SHOWN

4" BRICK, 8" BLOCK MASONRY

ROOFING FELT

LT. WT. FILL

MET. CLOSER

20 OZ. COPPER WATERSTOP CONTINUOUS BETWEEN STOPS SHOWN IN ⑤ & ⑥. SOLDER ALL JOINTS

3"x3"x¼" L HANGERS 6'-0" O.C. WELD TO 10 WF 36 & 5"x5"x⅝" L'S

C.J. 5"x5"x⅝" L'S WELDED

8" BLOCK MASONRY

3"x3"x¼" L CLOSER

8" BLOCK WALL

12"x12" SOLID CONC. BLOCK PIER

6"x4"x⅜" L JAMB

12" OVERHEAD DOOR

12'-0" Door Opng.

TAR & GRAVEL ROOFING FELT UNDER MET. COPING

BUILT UP ROOF ON 2" DECK

5"x4" ANGT. W

8" CH.S

⅜"x 5" CONT. W WELD TO C

6" BRICK & BLK.

5"x4" ANGT. W

5'-4" TO TOP OF 10 WF 36

10 WF 36

5'-4" TO WORK POINT OF BEAMS

℄ of COL.

5"x4" ANGT. W

4"x3"x⅜" L's BENT & WELDED TO C

10 WF 36

℄ of COL.

10 WF 36 BM

5'-4" TO WORK POINT OF BEAMS

OVERHD. DOOR TRACK

℄ of COLS.

4"x3"x⅜" L's CONT. WELD

10'-0" Door Opng.

BRICK

8" Copper Waterstop

5"x3" Comp. ang. 6'-0" O.C. SELF TAPPING SCREWS

⅜" A.B.'s WELDED CONTINUOUS

OVERHD. DOOR

℄ of COL.

½" OVERHD. DOOR

4"x3"x⅜" L's CONT. WELD

5"x3"x⅜" ANGLE

Caulk

Rubber Control Joint

Caulk

CONC. WALL BEYOND

BRICK & BLOCK MASONRY

TYPICAL VERTICAL CONTROL JOINT

2'-0" FACE OF COL.

5½" ⌀ PIPE REMOVABLE DOOR JAMB CUSTOM-FIT with CONC. & CAP.

5" CONC. RAMP & FOOTG. REINF. PITCH ¼" TO DRAIN

FINISH FLOOR LINE

ASPHALT PAVING

EXPANSION MOULD EXP. JOINT

5" CONC. SLAB C.I.P.C. NO MESH

24 Ga. CORR. DECK

4" GRAVEL FILL

4" PIPE SLEEVE IN 16"ø CONC. PIER SUP.

• PIPE TUNNEL •

4'-0"

• SECTION L/7 •

GRAPHIC SCALE

TWO INCHES

0 1 2

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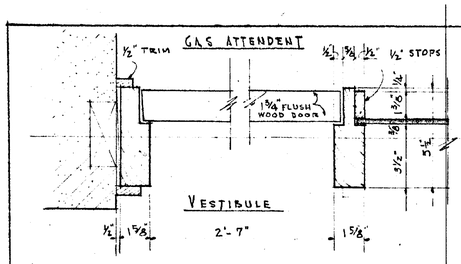
PROJECT	CLIENT	ARCHITECT	DATE ISSUED FOR	REV	BUL	SHEET
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST. • ANN ARBOR • MICHIGAN	THE CITY OF ANN ARBOR MICHIGAN	DOUGLAS D. LORFE 120 N. 4TH AVE. ANN ARBOR	7/12/57 BIDDING			7

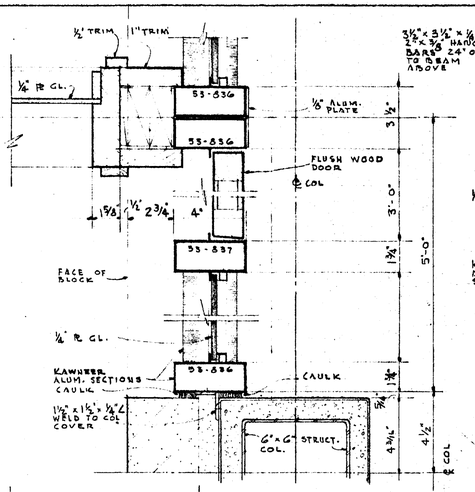
6-C-5671

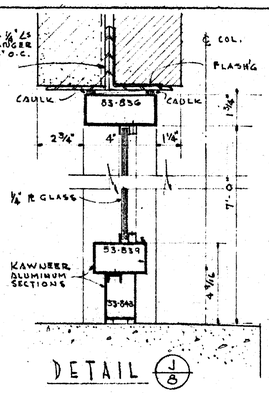
VESTIBULE DETAILS

ALUMINUM BY METAL SPECIALTIES CONTR.

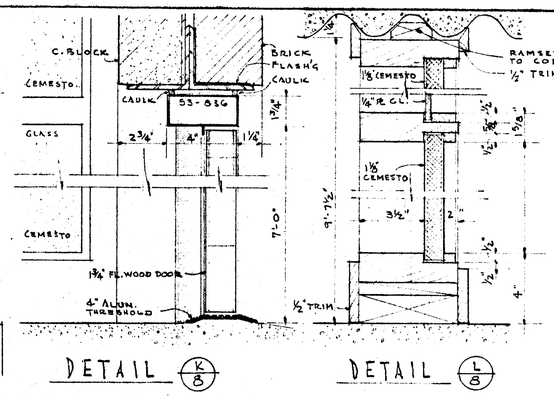


PLAN SECTION (H/8)
SCALE 3" = 1'-0"



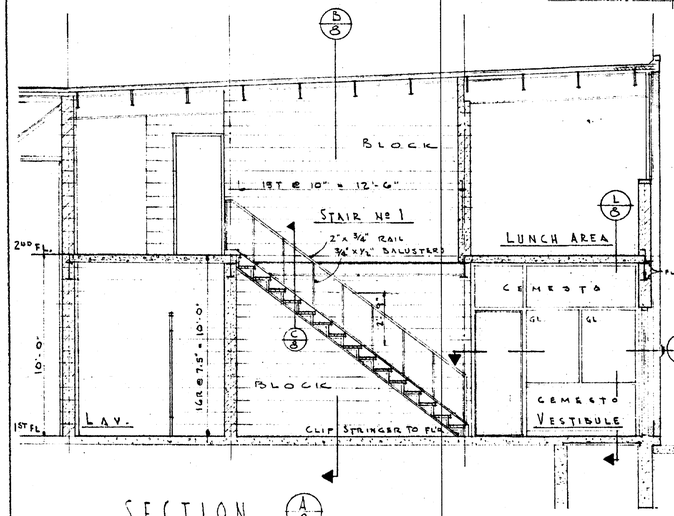


DETAIL (J/8)

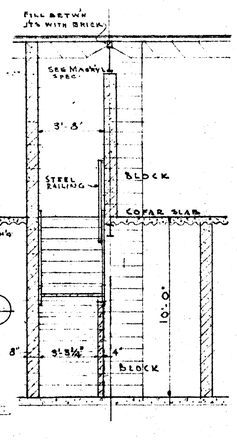


DETAIL (K/8) DETAIL (L/8)

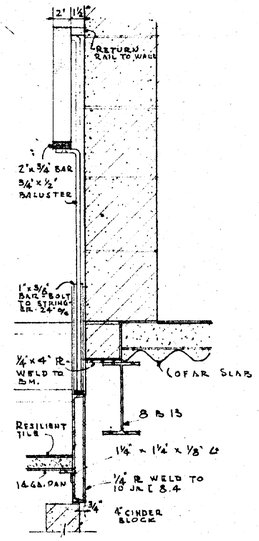
SCALE 3" = 1'-0"



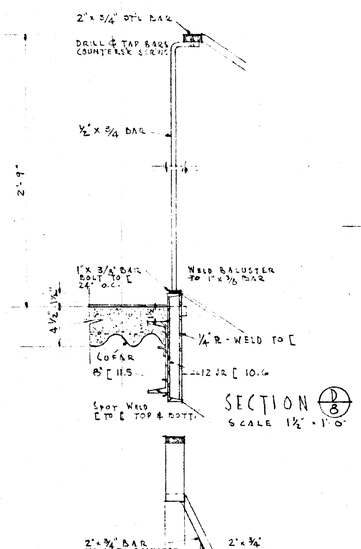
SECTION (A/8)
SCALE ¼" = 1'-0"



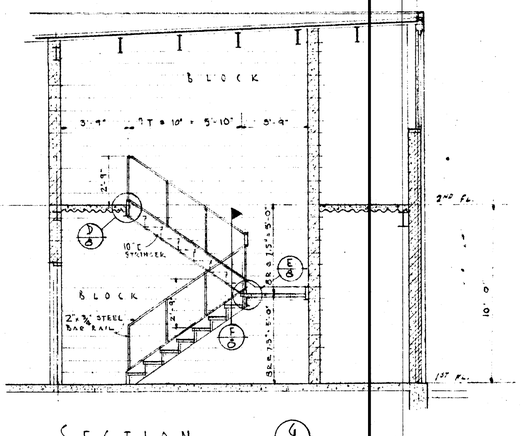
SECTION (B/8)
SCALE ¼" = 1'-0"



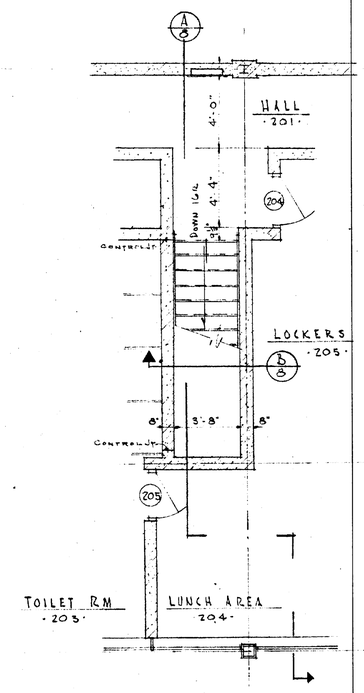
DETAIL (C/8)
SCALE 1½" = 1'-0"



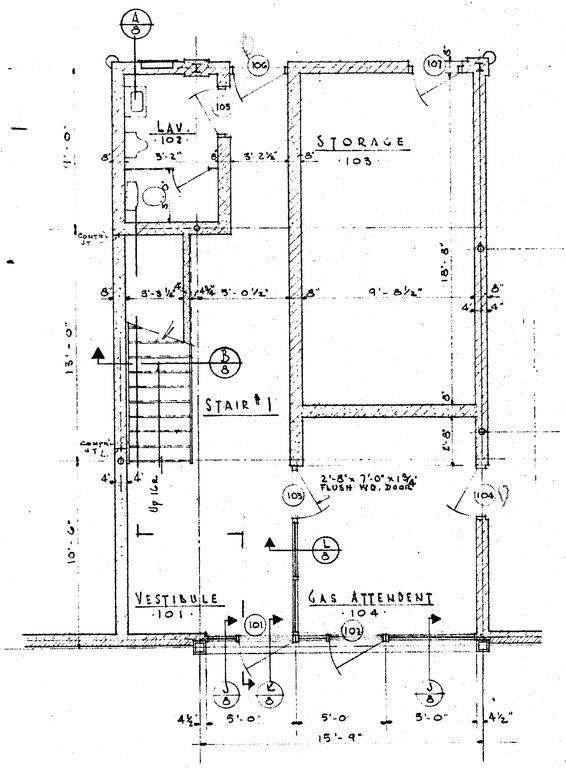
SECTION (D/8)
SCALE 1½" = 1'-0"



SECTION (G/8)
SCALE ¼" = 1'-0"

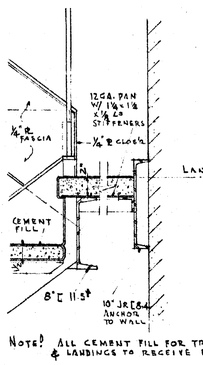


2ND FLOOR PLAN SCALE ¼" = 1'-0"



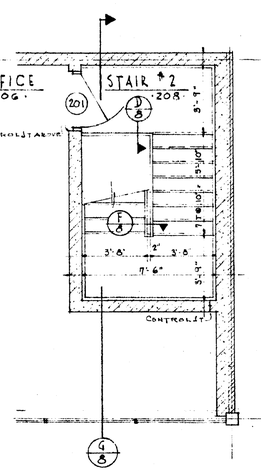
1ST FLOOR PLAN

DETAILS OF STAIR No. 1

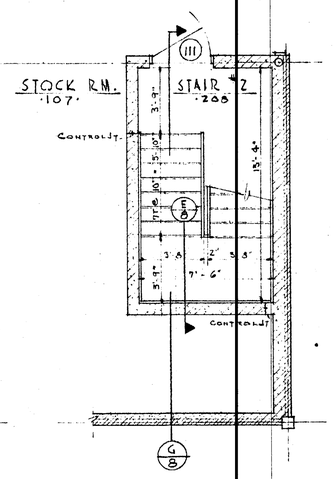


Note: ALL CEMENT FILL FOR TREADS & LANDINGS TO RECEIVE RESILIENT TILE

SECTION (E/8)
SCALE 1½" = 1'-0"



SECTION (F/8)



2ND FLOOR PLAN

1ST FLOOR PLAN

SCALE ¼" = 1'-0"

NOT AS-BUILT, BEST AVAILABLE INFO.

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GRAPHIC SCALE
TWO INCHES
0 1 2

DETAILS OF STAIR No. 2

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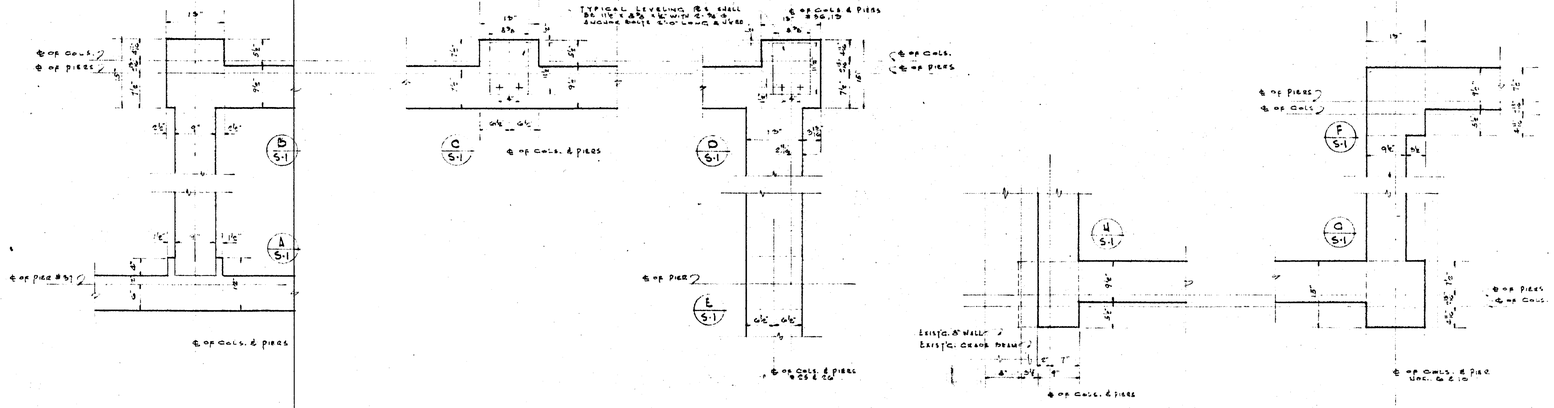
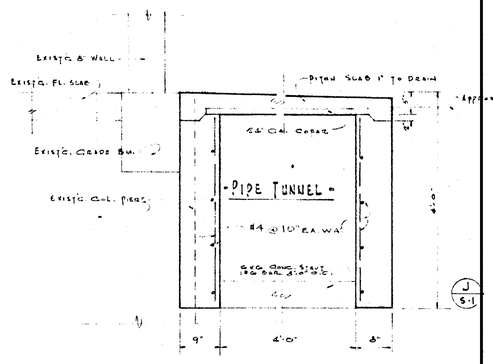
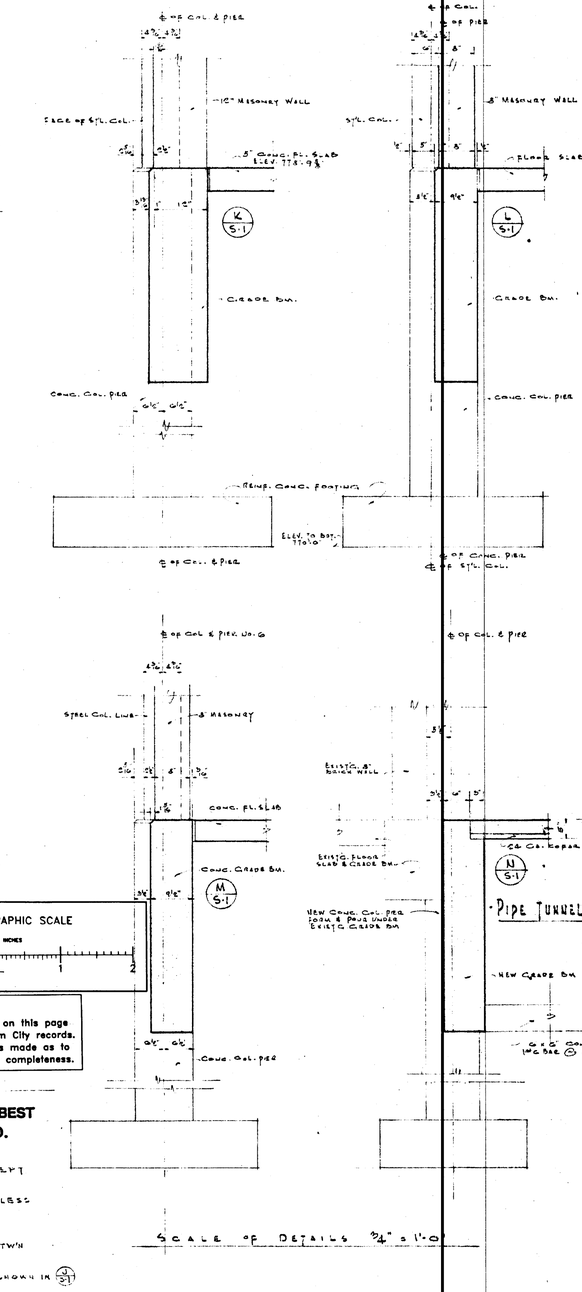
6-C-5621

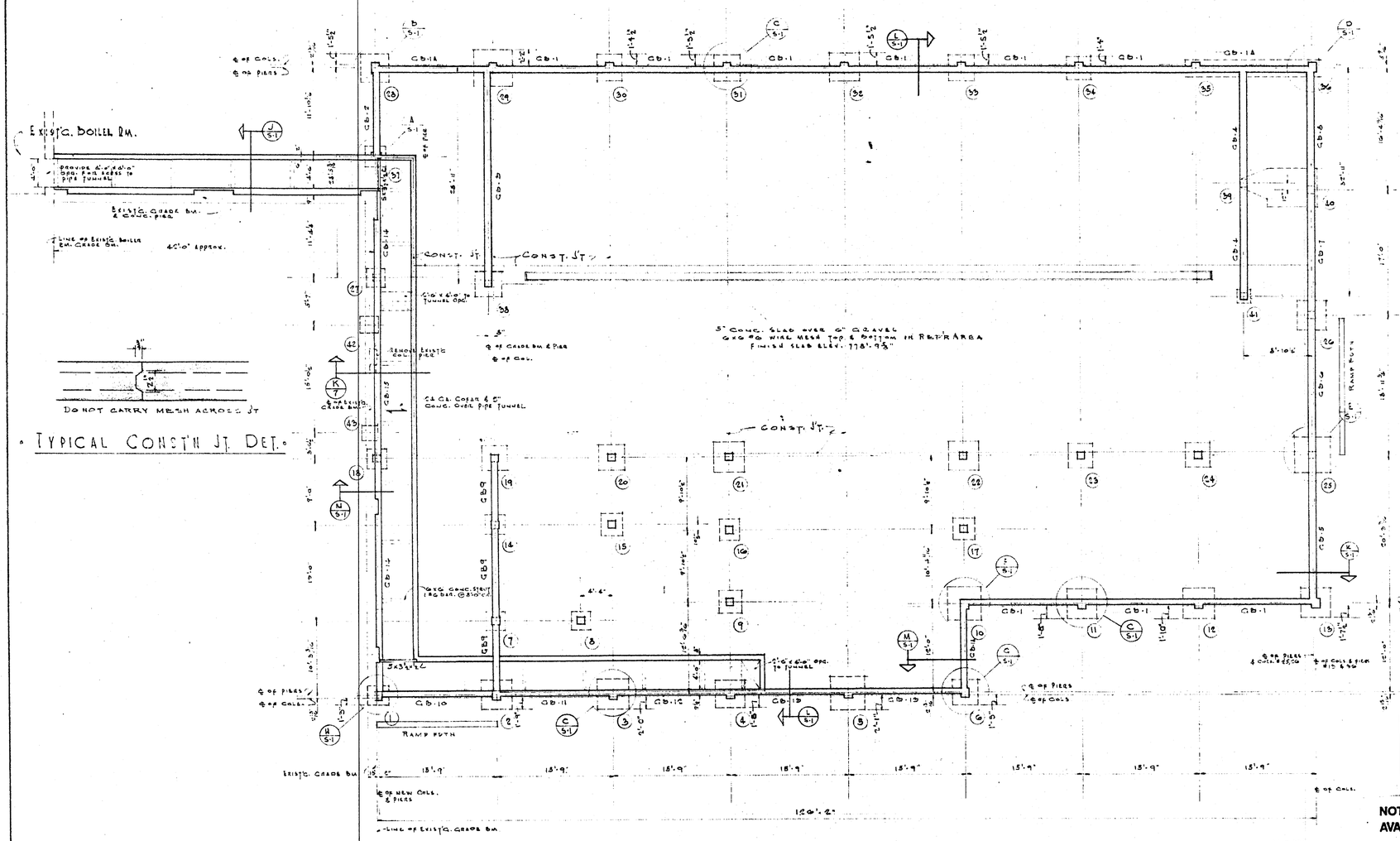


FOUNDATION PLAN DETAILS & SECTIONS

SCALE 3/8" = 1'-0"







TYPICAL CONSTN JT. DET.

FOUNDATION & FOOTING PLAN

SCALE 1/8" = 1'-0"

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NOTE
CENTER FTGS ON ℄ OF COLS, EXCEPT AS NOTED.
LOOSEN SOIL TO DEPTH OF NOT LESS THAN 4" UNDER GB1 THRU GB13.
TOP OF GB1 THRU GB13 SHALL BE AT MINUS FOR ELEV. EXP. JT FILLER BETWN SLAB AND SLAB.
REINFORCE INSIDE TUNNEL WALLS AS SHOWN IN S-1

PROJECT	CLIENT	ARCHITECT	DATE	ISSUED FOR	REV.	BUL.	SHEET
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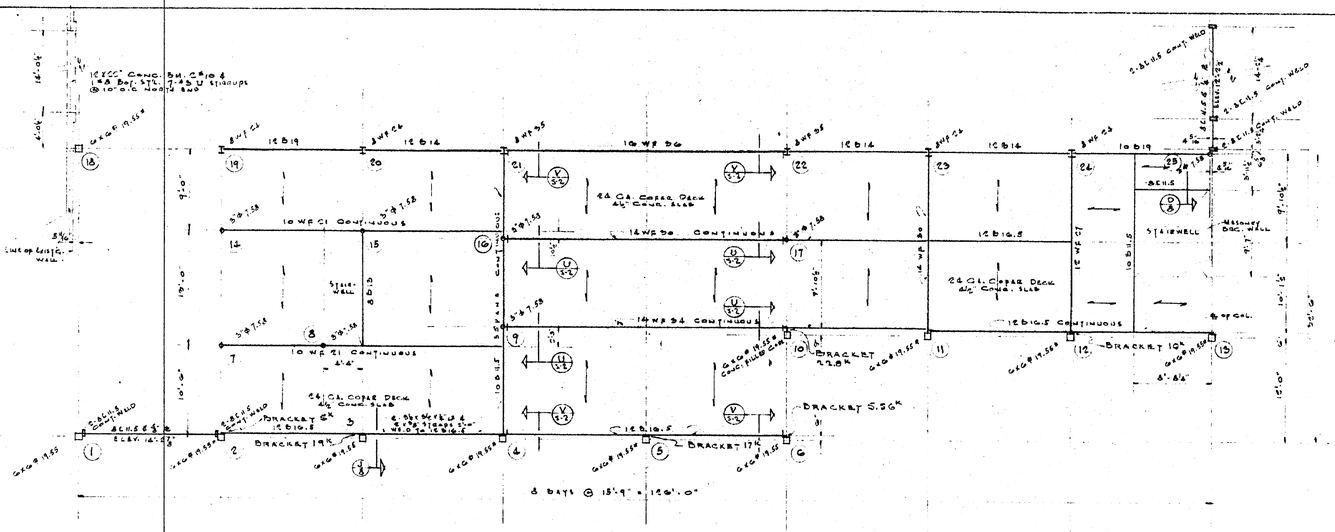
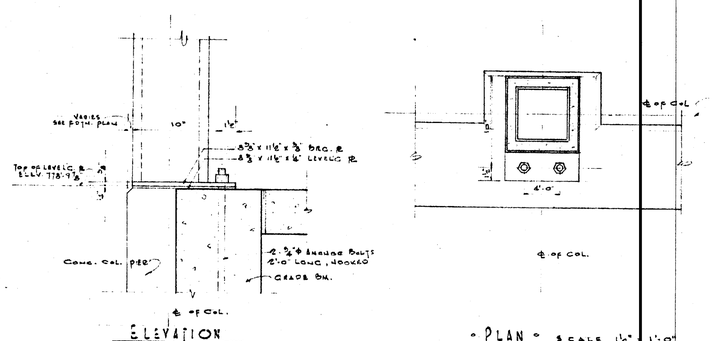
6-C-5621



SECOND FLOOR FRAMING PLAN

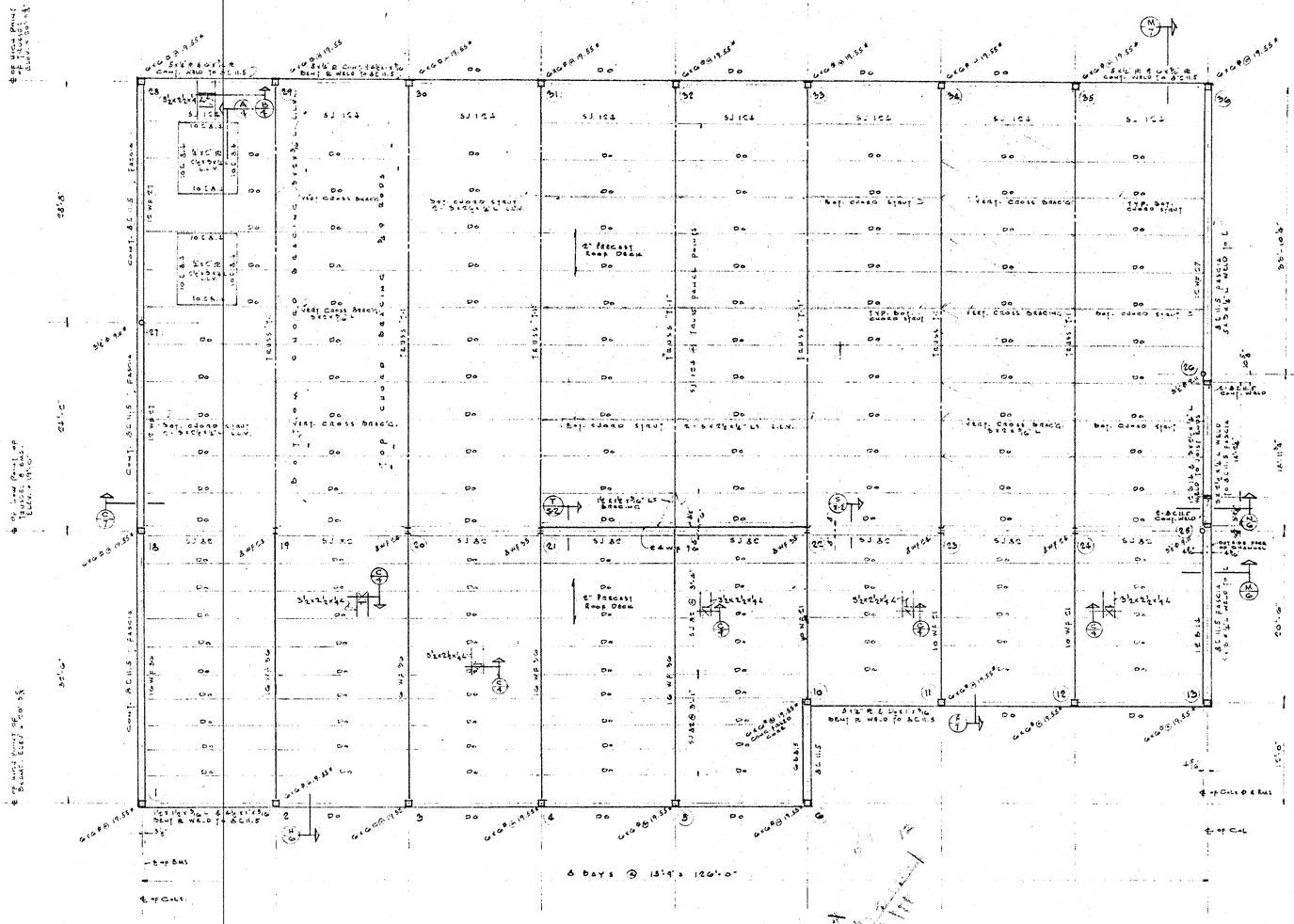
SCALE 1/8" = 1'-0"



ELEVATION

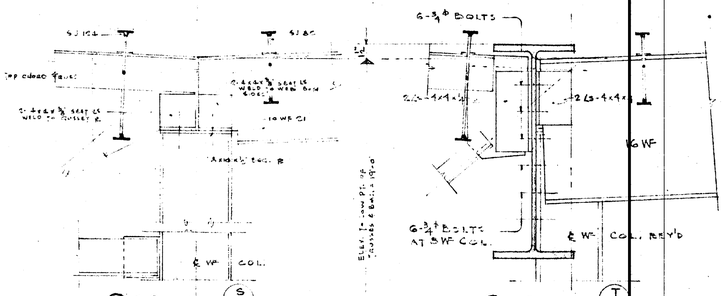
PLAN SCALE 1 1/2" = 1'-0"

TYPICAL COL. BASE PLATE DETAIL



ROOF FRAMING PLAN

SCALE 1/8" = 1'-0"



DETAIL S/S-2

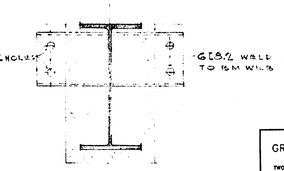
DETAIL T/S-2

SCALE 1 1/2" = 1'-0"

GENERAL NOTES:

1. ELEVATION TO TOP OF ALL 2ND FLOOR FRAMING STEEL SHALL BE 9'-7 1/2" UNLESS OTHERWISE INDICATED.
2. ALL 6x6 @ 19.55 COLS. SHALL BE HOLLOW CORE EXCEPT COL. #10. PROVIDE 1" LIGHT WT. CONCRETE FIREPROOFING FOR ALL 6x6 COLS. & ENCASE IN 3/16" STEEL SHELL.
3. CUT 3/16" SHELL AS REQUIRED TO MEMBERS CONNECT'G. TO COL. CORE. CUTTING SHALL BE NEATLY DONE.
4. WHERE BMS FRAME OVER COL'S 8, 15, & 17 USE CLAMPS FOR EXECTN AND WELD. DO NOT PUNCH B'M FLANGES.
5. ELEV. ARE GIVEN FROM H.P. OF 1ST. FL'R SLAB AT 778'-9 3/8".

COLUMN BASE PLATE SCHEDULE		
COLUMN NO.	B.P. SIZE	REMARKS
1, 2, 3, 4, 5, 10, 11, 12, 18, 23, 30, 31, 32, 33, 34, 35	8 3/8 x 3/8 x 11 1/2 1.	FINISH W/ C'SK'S ON 3 SIDES
6, 13, 28 & 36	DO. 1.	11 1/2" 8 3/8"
7, 8, 9, 14, 15, 16, 17, 25, 26, & 27	6 x 5/8 x 6	
19, 20, 21, 22, 23, 24	10 x 3/4 x 10	
CHANNEL DOOR FRAMES		CLIP L. SECURE W/ EXP. BOLTS
	1. USE 1/4" THICK LEVELING PL'S UNDER THESE BASE PL'S.	
ALL COLS SHALL HAVE 2-3/4" ϕ HYD ANCH. BOLTS		
ELEV. OF BOT. OF B.P.'S UNDER W.F. & PIPE COL'S 778'-10 3/8" FOR SQ. COL'S SEE DET. THIS SHEET.		
WHERE MEMBERS FRAME ON TOP, COL'S SHALL HAVE 3/8" TH. CAP, EXCEPT AS NOTED.		



DETAIL U/S-2

SCALE 1 1/2" = 1'-0"

BRACKETS FOR FUTURE B'MS

DET. V/S-2 SIMILAR WITH ONE BRACKET

GRAPHIC SCALE

TWO INCHES

0 1 2

NOT AS-BUILT, BEST AVAILABLE INFO.

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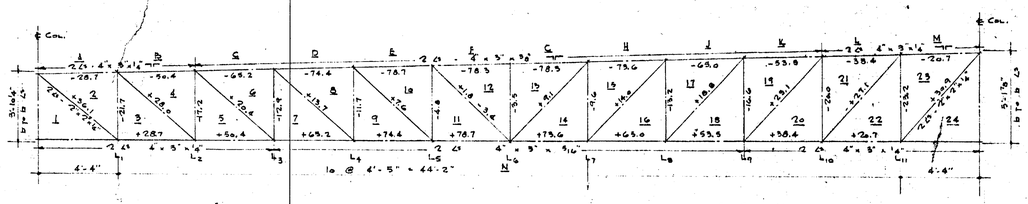
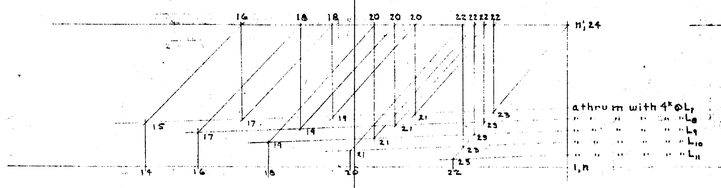
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST. · ANN ARBOR · MICHIGAN	THE CITY OF ANN ARBOR MICHIGAN	DOUGLAS D. LOREE 120 N 4TH AVE. · ANN ARBOR	7/12/57	BIDDING			S-2 6-C-5621



(EXCEPT AS OTHERWISE NOTED ABOVE, ALL WEB MEMBERS SHALL BE 2 - 3" x 1½" x ¼").
ALL GUSSET PLS ⅜" TH.

• ELEVATION •

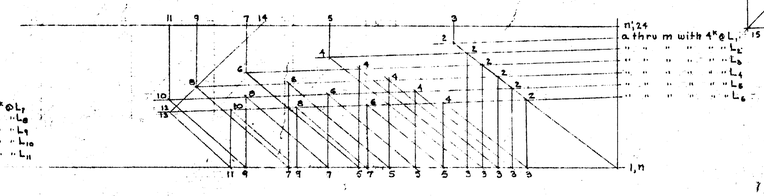
SCALE: ½" = 1'-0"



• STRESS DIAGRAM •

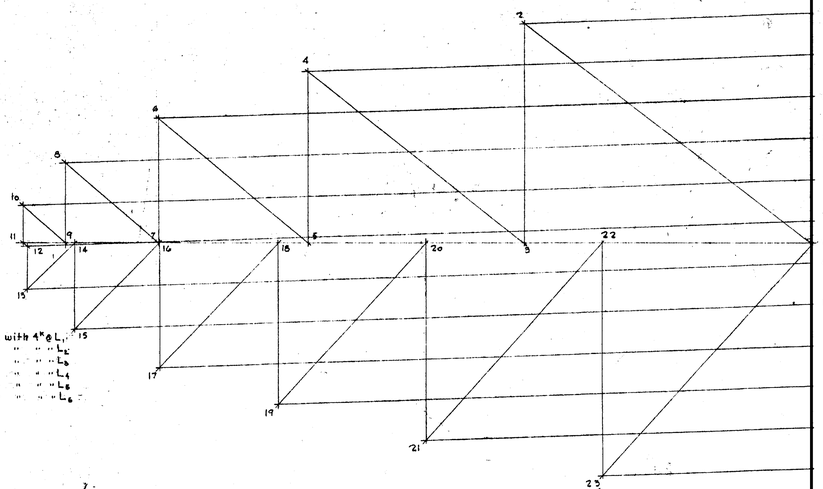
SCALE: ½" = 1"

THESE COMBINED DIAGRAMS GIVE MAX. STRESSES DUE TO 4" LOAD AT ANY BOTTOM CHORD PANEL POINT.



• STRESS DIAGRAM •

SCALE: ½" = 1"



• STRESS DIAGRAM •

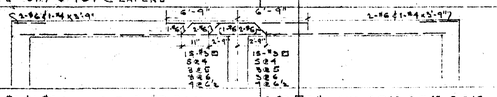
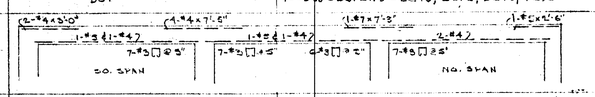
(DEAD LOAD + LIVE LOAD)
SCALE: 1" = 6"

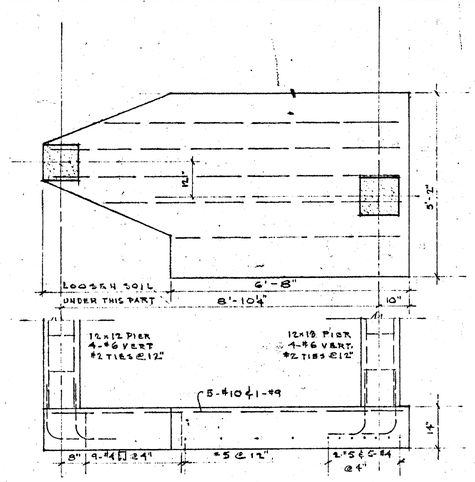
• TRUSS DESIGN "T-1"

• CONC. COLUMN & FOOTING SCHEDULE •

NUMBER		1	2,11,15	3,12	4,28	5	6	7,8,27	9,17	10	14,16,18	15	19,23,26	20	21	22	25	26	29	30,34	31,33	32	35,36	37	38	39,40	41	42	43
COLUMN OR PIER	SIZE	15"x18"	15"x15"	15"x15"	15"x15"	15"x15"	15"x15"	12"x12"	12"x12"	15"x15"	12"x12"	12"x12"	12"x12"	12"x12"	12"x12"	12"x12"	12"x15"	12"x15"	15"x15"	15"x15"	15"x15"	15"x15"	15"x18"	12"x12"	12"x12"		12"x12"	12"x15"
	VERT. REINF.	2-#6, 2-#7	2-#6, 2-#7	2-#6, 2-#7	2-#6, 2-#7	2-#6, 2-#7	2-#6, 2-#7	4-#6	4-#6	4-#6	4-#6	4-#6	4-#6	4-#6	4-#6	4-#6	4-#6	4-#6	2-#6, 2-#7	2-#6, 2-#7	2-#6, 2-#7	2-#6, 2-#7	2-#6, 2-#7	2-#6, 2-#7	4-#6	4-#6		4-#6	4-#6
	TIES	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"	#2@12"		#2@12"	#2@12"
FOOTING	SIZE	2'-9" SQ.	4'-1" SQ.	4'-4" SQ.	3'-0" SQ.	4'-1" SQ.	3'-0" SQ.	2'-6" SQ.	3'-11" SQ.	4'-6" SQ.	2'-9" SQ.	3'-0" SQ.	3'-5" SQ.	3'-6" SQ.	4'-3" SQ.	4'-1" SQ.	4'-10" SQ.	3'-9" SQ.	3'-1" SQ.	3'-3" SQ.	3'-0" SQ.	3'-5" SQ.	COMBINED FOOTING SEE DET. SHTS 2-3	2'-9" SQ.	3'-3" SQ.	COMBINED FOOTING SEE DET. SHT #2-3	1'-9" SQ.	2'-6" SQ.	2'-11" SQ.
	THICKNESS	10½"	11"	15"	15"	14"	10½"	10½"	10½"	15"	10½"	10½"	10½"	10½"	15"	11"	14"	11"	14"	10½"	10½"	10½"	SEE DET. SHTS 2-3	10½"	10½"		10½"	10½"	
	REINFORC'G.	6-#6 EA. WAY	11-#6 EA. WAY	11-#6 EA. WAY	10-#6 EA. WAY	11-#6 EA. WAY	9-#6 EA. WAY	6-#6 EA. WAY	6-#6 EA. WAY	6-#6 EA. WAY	11-#6 EA. WAY	6-#6 EA. WAY	6-#6 EA. WAY	9-#6 EA. WAY	9-#6 EA. WAY	11-#6 EA. WAY	11-#6 EA. WAY	10-#6 EA. WAY	10-#6 EA. WAY	10-#5 EA. WAY	8-#6 EA. WAY	9-#6 EA. WAY	9-#6 EA. WAY		6-#6 EA. WAY	8-#6 EA. WAY		6-#6 EA. WAY	6-#6 EA. WAY
	ELEVATION OF BOTTOM	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"	770'-0"
REMARKS		SEE DETAIL						SEE DET. FOR #27			SEE DET. FOR #18																		

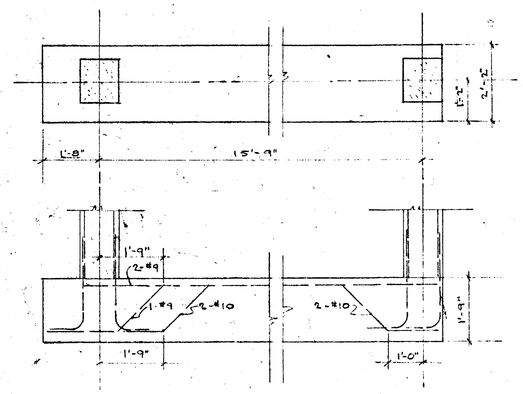
GRADE BEAM SCHEDULE

NUMBER	SIZE	REINFORCING	REMARKS
GB1&1A	9½"x48"	1-#9 CONT. TOP & BOTT. PLUS 1-#10 BOTT. IN 1A.	SEE SEC. A FOR ADDITIONAL REINFORC'G
GB2	DO.	2-#7 & 2-#6 BOTT.	
GB3	12"x24"	2-#9 & 2-#8 BOTT. 2-#6 X 7'-0" & 2-#5 X 7'-0" TOP @ EA. END	
GB4	12"x16"		
GB5	13"x48"	1-#8 & 1-#7 CONT. TOP, 3-#9 BOTT.	6-#3 □ @ NO. END - 2@12, 2@15, 2@18
GB6	13"x48"	DO.	7-#3 □ @ SO. END - 4@10, 2@12, 1@18 7-#3 □ @ 12 @ NO. END
GB7	13"x48"	DO.	6-#3 □ @ EA. END - 2@12, 2@15, 2@18
GB8	DO.	DO.	7-#3 □ @ SO. END - 2@10, 2@12, 2@15, 1@18
GB9	10"x12"		
GB10	9½"x48"	1-#7 & 1-#6 CONT. TOP; 1-#10 & 1-#7 BOTT.	5-#3 □ @ E. END - 5@6, 4@8, 1@18"
GB11	9½"x48"	DO. 1-#10 BOTT.	10-#3 □ @ W. END - DO.
GB12	9½"x48"	DO. DO.	
GB13	9½"x48"	DO. DO.	
GB14&15	DO.	DO. DO.	CARRY GB15 DOWN TO TOP OF FTG AT EXIST'G PIER.



COMBINED FOOTING FOR PIERS 39 & 40

SCALE ½"=1'-0



COMBINED FOOTING FOR PIERS 35 & 36

SCALE ½"=1'-0"

GRAPHIC SCALE
TWO INCHES
0 1 2

NOTE:
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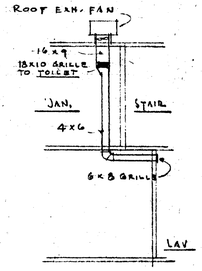
NOT AS-BUILT, BEST AVAILABLE INFO.

NOTE
ELEV. OF TOP OF ALL PIERS 778-7⅝"

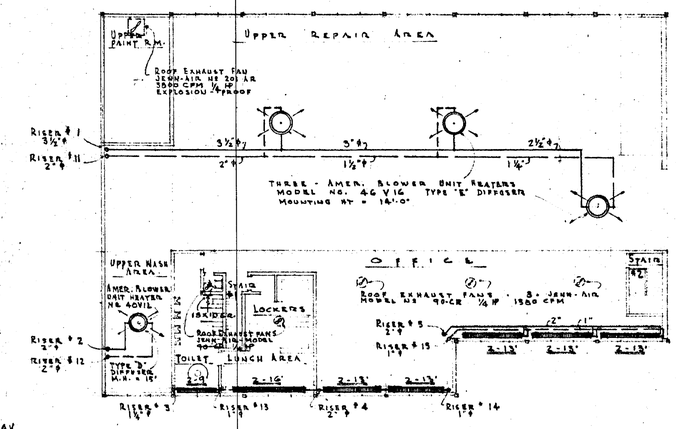
PROJECT	CLIENT	ARCHITECT	DATE	ISSUED FOR	REV.	BY	SHEET
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST., ANN ARBOR, MICHIGAN	THE CITY OF ANN ARBOR, MICHIGAN	DOUGLASS D. LOREE 120 N. 4TH AVE., ANN ARBOR	7/12/57	BIDDING			S-3 6-C-5621



DUCT DIAGRAM

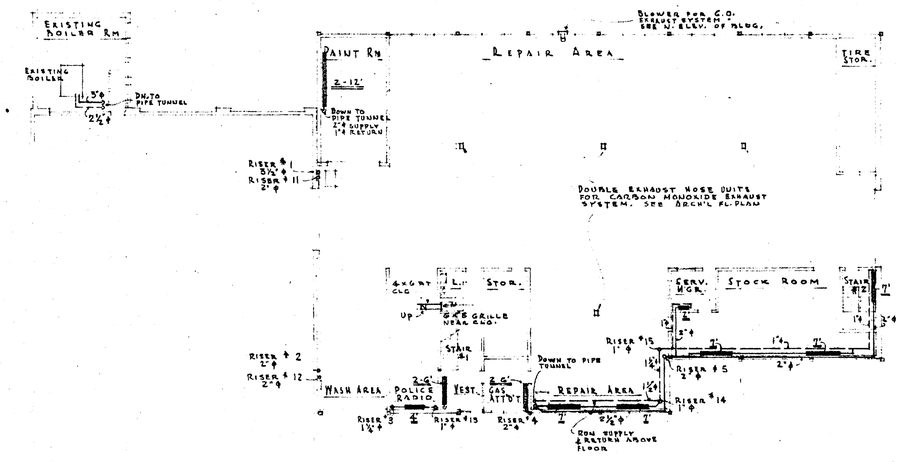
NO SCALE

DUCTWORK BY VENT. CONTR.



SECOND FLOOR PLAN

SCALE 1/16" = 1'-0"

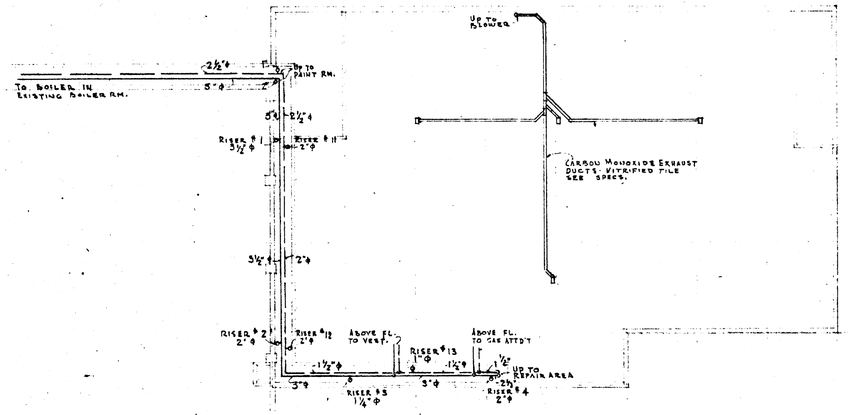


FIRST FLOOR PLAN

SCALE 1/16" = 1'-0"

SYMBOLS:

- SUPPLY MAIN
- SUPPLY RISER (NUMBERS 1 TO 10)
- RETURN MAIN
- RETURN RISER (NUMBER 11-20)
- FIN-TUBE RADIATOR 1½" IPS - 1⅝" x 3⅛" x 24GA FINS 32 FINS/FT
- UNIT HEATER



FOUNDATION PLAN

SCALE = 1/16" = 1'-0"

NOTE:
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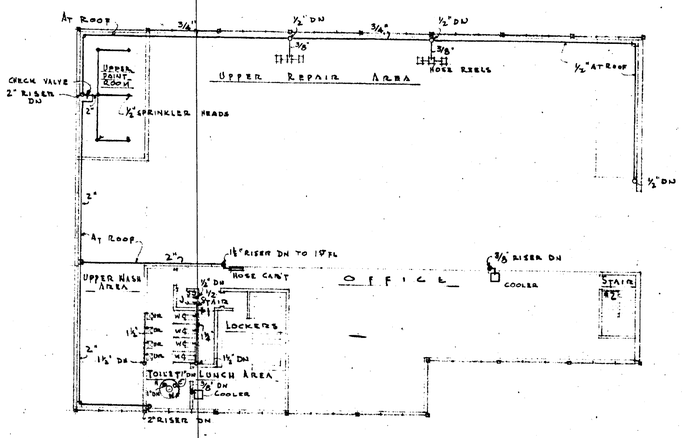
NOT AS-BUILT, BEST AVAILABLE INFO.

GRAPHIC SCALE
TWO INCHES
0 1 2

HEATING LAYOUTS & DETAILS

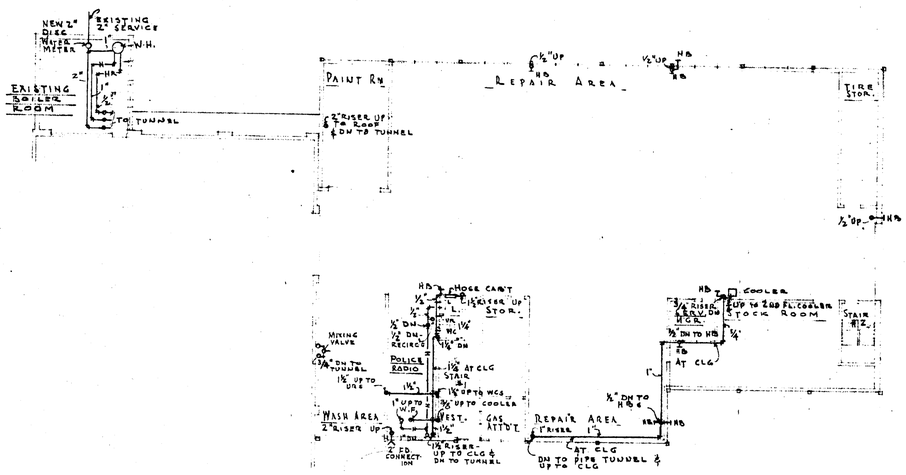
PROJECT	CLIENT	ARCHITECT	DATE	ISSUED FOR	REV	BUL.	SHEET
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST. ANN ARBOR - MICHIGAN	THE CITY OF ANN ARBOR MICHIGAN	DOUGLAS D. LOREE 120 N. 4TH AVE. ANN ARBOR	7/12/57	BIDDING			M-1

6-C-5621



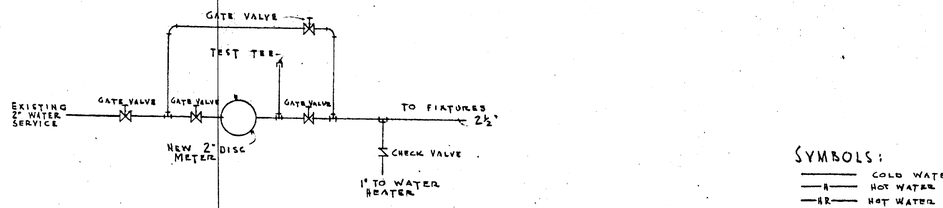
SECOND FLOOR PLAN

SCALE 1/16" = 1'-0"



FIRST FLOOR PLAN

SCALE 1/16" = 1'-0"

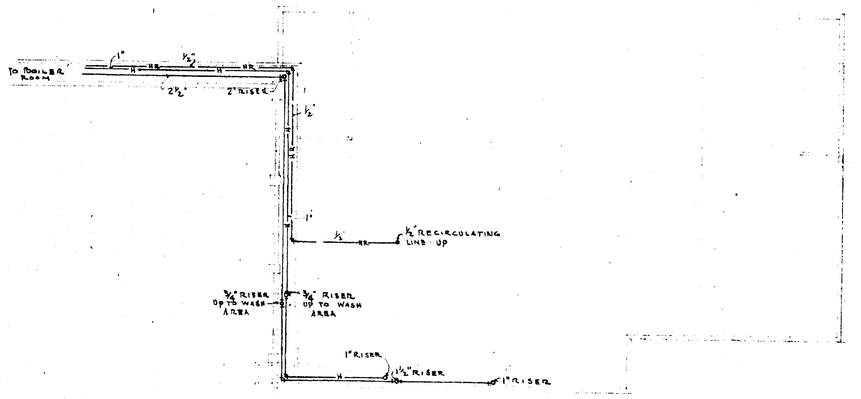


METER SECTION DETAIL

NO SCALE

SYMBOLS:

- COLD WATER
- H — HOT WATER SUPPLY
- HR — HOT WATER RECIRCULATING



FOUNDATION PLAN

SCALE = 1/16" = 1'-0"

WATER SUPPLY LAYOUT & DETAILS

SCALE AS NOTED

NOT AS-BUILT, BEST AVAILABLE INFO.

NOTE:
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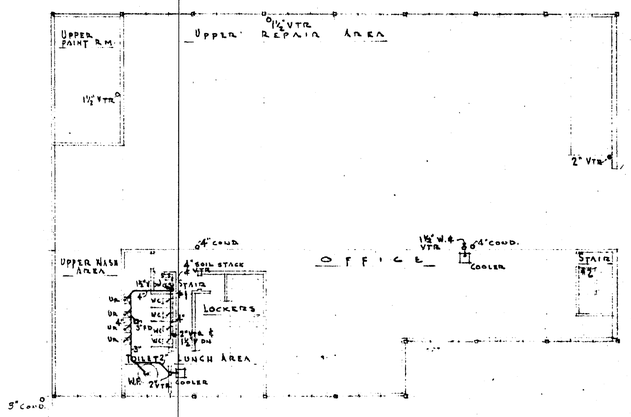
GRAPHIC SCALE
TWO INCHES
0 1 2

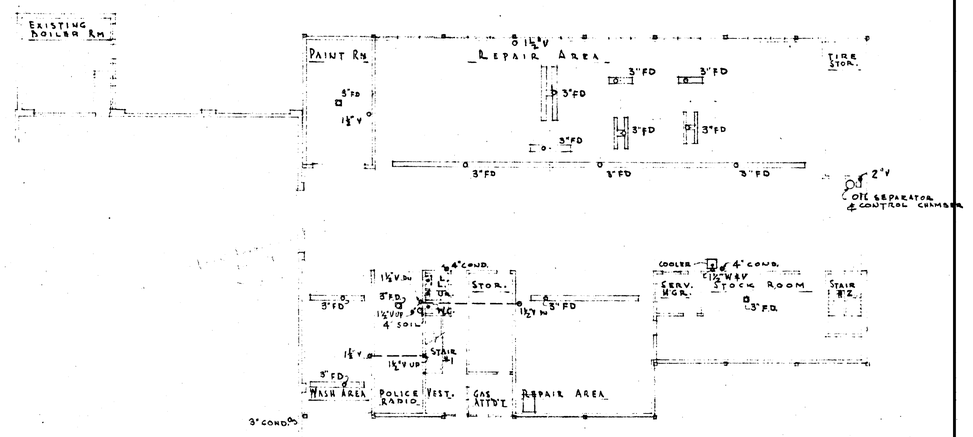
PROJECT	CLIENT	ARCHITECT	DATE	ISSUED FOR	REV.	BUL.	SHEET
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST. ANN ARBOR, MICHIGAN	THE CITY OF ANN ARBOR MICHIGAN	DOUGLAS D. LOREE 120 N. 4TH AVE. ANN ARBOR	7/12/57	BIDDING			M-2

6-C-5621



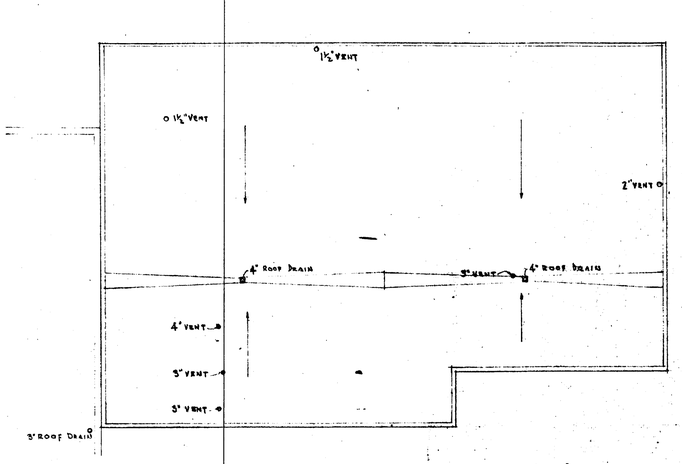
SECOND FLOOR PLAN

SCALE 1/16" = 1'-0"



FIRST FLOOR PLAN

SCALE 1/16" = 1'-0"

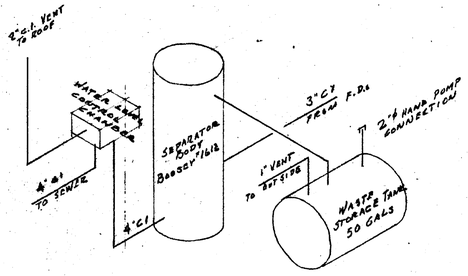


ROOF PLAN

SCALE 1/16" = 1'-0"

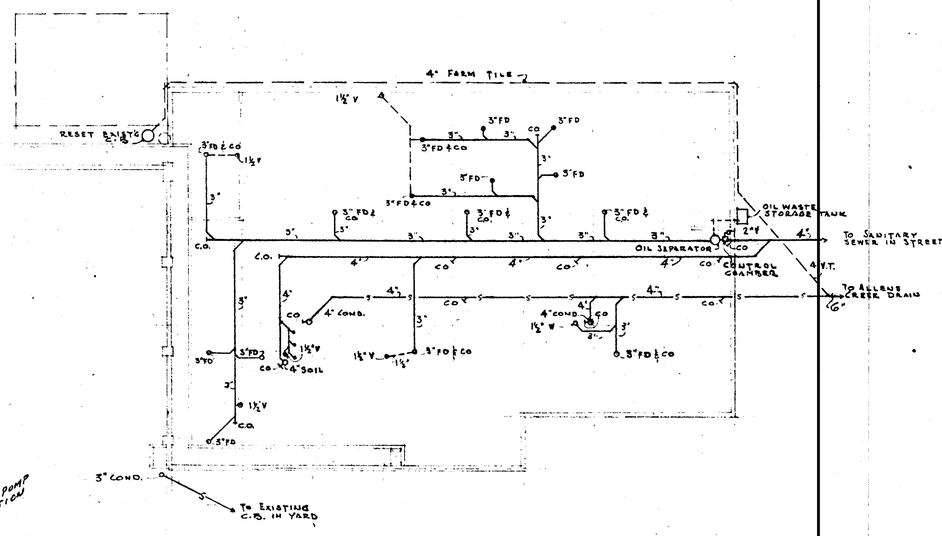
ABBREVIATIONS:

CO	CLEAN OUT
FD	FLOOR DRAIN
L	LAVATORY
WC	WATER CLOSET
WF	WASH FOUNTAIN
UR.	URINAL
W	WASTE
V	VENT
VTR	VENT THRU ROOF
SS	SERVICE SINK
CB	CATCH BASIN
	SANITARY
S	STORM
	VENT



·SEPARATOR DET.·

No Scale



FOUNDATION PLAN

SCALE · 1/16" · 1'-0"

NOT AS-BUILT, BEST AVAILABLE INFO.

GRAPHIC SCALE
TWO INCHES
0 1 2

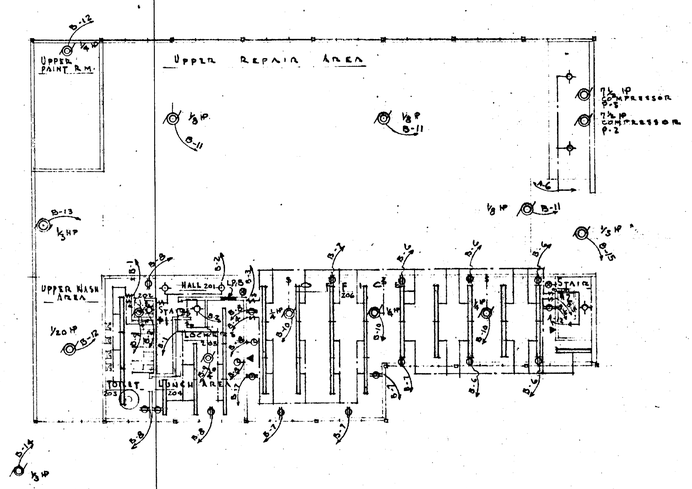
NOTE:
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

·PLUMBING & DRAINAGE LAYOUTS & DETS.·

SCALE AS NOTED

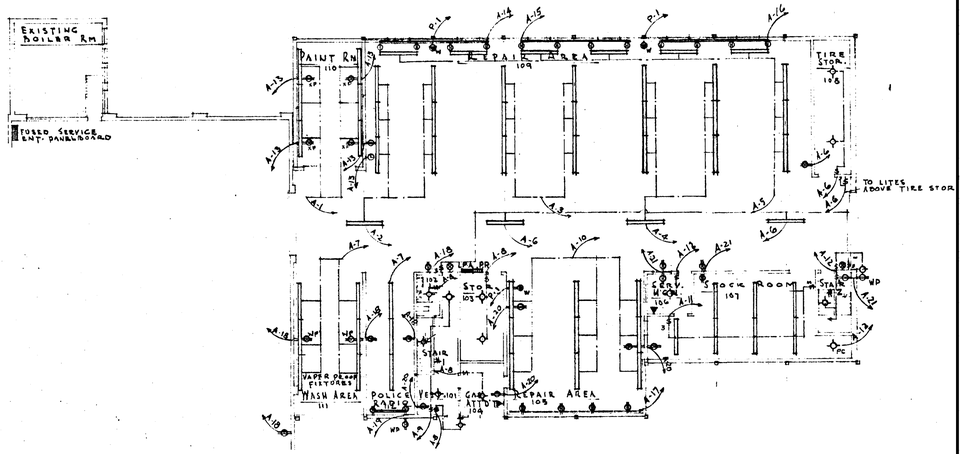
PROJECT	CLIENT	ARCHITECT	DATE	ISSUED FOR	REV.	SUB.	SHEET
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST. ANN ARBOR - MICHIGAN	THE CITY OF ANN ARBOR MICHIGAN	DOUGLAS D. LOREE 120 N. 4TH AVE. ANN ARBOR	7/12/57	BIDDING			M-3

6-C-5621



SECOND FLOOR PLAN

SCALE 1/16" = 1'-0"



FIRST FLOOR PLAN

SCALE 1/16" = 1'-0"

FIXTURE SCHEDULE

ROOM	NO	FIXTURE	MOUNTING	HT.
REPAIR AREA	40	DAYBRITE CFI-10 2-96" T-12 SLIM-LINE LAMPS	CHAIN SUSPENSION FIXTURES IN REPAIR AREA 109 15' HI. BRACKET @ FIXTURES AT NORTH WALL. ALL OTHERS 8' HI	8'
POLICE RADIO	8			8'
STOCK RM.	7			8'
TOILET	3			8'
LUNCH RM	5			8'
LOCKER RM	3			8'
LAV	1	R.L.M. REFLECTOR (PC)	WALL BRACKET	7'
STOCK RM	1		CLG. SURFACE	
TIRE STOR.	2		WALL BRACKET	7'-6"
ABOVE T. STOR.	2		CLG. SURFACE	
HALL	2			
OFFICE	23	DAYBRITE CFI-23	CHAIN SUSPENDED	8'
PAINT RM	6	FIXTURE FOR 2-96" T-12 SLIMLINE, UL APPROVED FOR CLASS I HAZARDOUS LOCATION.	ADJUSTABLE WALL BRACKETS	8'
WASH AREA	6	FIXTURE FOR 2-96" T-12 SLIMLINE, UL APPROVED FOR WET LOCATIONS.	ADJUSTABLE WALL BRACKETS	8'
OUTSIDE VESTIBULE	1	PRESCOLITE WB-2-2	SURFACE	8'
OUTSIDE STAIR #2	1			8'
STAIR #1	1			7'-6"
HALL STAIR #2	1	EXIT FIXTURE DAYBRITE #2546	SURFACE	7'-6"
OFFICE OVER DOOR #106	1	EXIT FIXTURE DAYBRITE # 2506	RECESSED	7'-6"
STORAGE	2	PORCELAIN SOCKET	SURFACE	CLG.
JANITOR	1			
VESTIBULE GAS ATTD'T SERV. MGR LOCKERS	2 1 1 1	PRESCOLITE # 7315	SURFACE	CLG.

DISTRIBUTION LAYOUT

To Pole Line 2-400 MCM, 1-250 MCM, 1-3/0 TW 3"φ C.

LIGHTING PANEL "A"

200 A, 3 WIRE, 110/220 V, S.N., 2Φ

				BRANCH CIRCUITS WIRE	CONDUIT
CIRC. # 1	15A	LIGHTING		2-#12 TW	½" φ
2	15A	Do		Do	"
3	15A	Do		Do	"
4	15	Do		Do	"
5	20	Do		Do	"
6	20	Do		Do	"
7	20	Do		2-#10	¾"
8	15	Do		2-#12	½"
9	15	Do		Do	"
10	20	Do		2-#10	¾"
11	15	Do		2-#12	½"
12	15	Do		Do	"
13	15	RECEPT'LES		Do	"
14	20	PLUG MOLD		2-#10	¾"
15	20	Do		2-#10	"
16	20	Do		2-#10	"
17	20	Do		2-#10	"
18	20	RECEPT'LES		2-#12	½"
19	20	PLUG MOLD		2-#10	¾"
20	20A	RECEPT'LES		2-#12	½"
21	20A	Do		2-#10	¾"
22	15A	EXIT LITES		2-#12	½"
23	SPARE				
24	Do				
25	Do				
26	Do				

METER SECTION

100A

60A

200A

100A BRANCH SPACE

60A BRANCH SPACE

200A

Existing Serv. Switch 3-#3/0, 1-2#1 TW 2½"C

3-#4/0 2½"C

3-#4 1½"C

LIGHTING PANEL "B"

100 A, 3 WIRE, 110/220 V, S/N

			BRANCH CIRCUITS WIRE	CONDUIT
CIRC. # 1	20A	LIGHTING	2-#12	½"C
2	15A	Do	Do	"
3	20	Do	Do	"
4	20	Do	Do	"
5	15	Do	Do	"
6	20	RECEPT'LES	Do	"
7	20	Do	Do	"
8	15	Do	Do	"
9	15	FANS	2-#14	"
10	15	FANS	Do	"
11	15	HEATERS	Do	"
12	15	FAN & HTR	Do	"
13	15	DOOR OPR. (2P)	Do	"
14	15	Do (2P)	Do	"
15	15	Do (2P)	Do	"
16	15	Do (2P)	Do	"
17	15A	EXIT LITES	2-#12	½"C
18	SPARE			
19	Do			
20	Do			

POWER PANEL

225 A, 3 WIRE

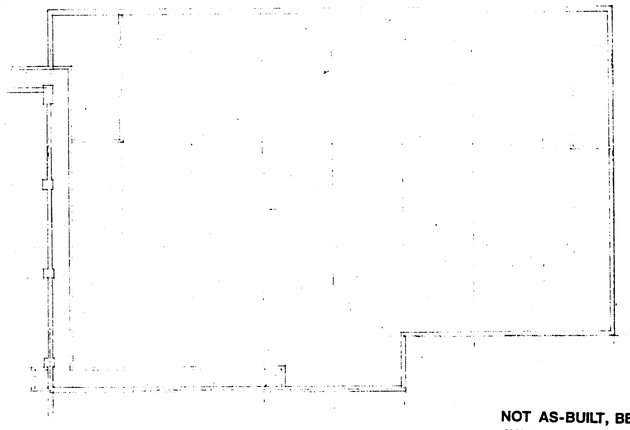
			BRANCH CIRC. WIRE	CONDUIT
1	100A	WELD'G RM.	3-#4 TW	1½" φ
2	30A	COMPRESS.	3-#10	¾"C
3	30A	Do	3-#10	¾"C

SYMBOLS

- 2 LAMP 8'-0" SLIMLINE FIXTURE
- 2 LAMP 4'-0" FLUORES. FIXTURE
- INCANDESCENT FIXTURE
- EXIT FIXTURE
- DUPLEX CONVENIENCE OUTLET
- SINGLE POLE SWITCH
- 3 WAY SWITCH
- MOTOR
- HOME RUN TO PANEL BOARD (CIRCUIT NO.)
- LIGHTING PANEL
- SWITCH WITH PILOT LITE
- PLUG MOLD OUTLETS
- TELEPHONE OUTLETS
- OUTLET FOR 20 HP 3Φ WELDING
- EXPLOSION PROOF OUTLET
- CLOCK OUTLET
- WEATHER PROOF OUTLET

NOTES

- ALL FLUORESCENT FIXTURES SHALL BE RAPID START.
- ALL FLUORESCENT & SLIMLINE LAMPS SHALL BE "WARM WHITE"
- ALL PAINT ROOM ELEC. SHALL BE EXPLOSION PROOF



FOUNDATION PLAN

SCALE = 1/16" = 1'-0"

NOT AS-BUILT, BEST AVAILABLE INFO.

GRAPHIC SCALE
TWO INCHES
0 1 2

NOTE:
Data contained on this page was drawn from City records. No guarantee is made as to its accuracy or completeness.

LIGHTING & WIRING LAYOUTS & DETAILS

PROJECT	CLIENT	ARCHITECT
ADDITIONS & ALTERATIONS TO MUNICIPAL GARAGE 721 N. MAIN ST. ANN ARBOR · MICHIGAN	THE CITY OF ANN ARBOR MICHIGAN	DOUGLAS D. LOREE 120 N. 4TH AVE ANN ARBOR

DATE	ISSUED FOR	REV	BUL.	SHEET
7/12/57	BIDDING			

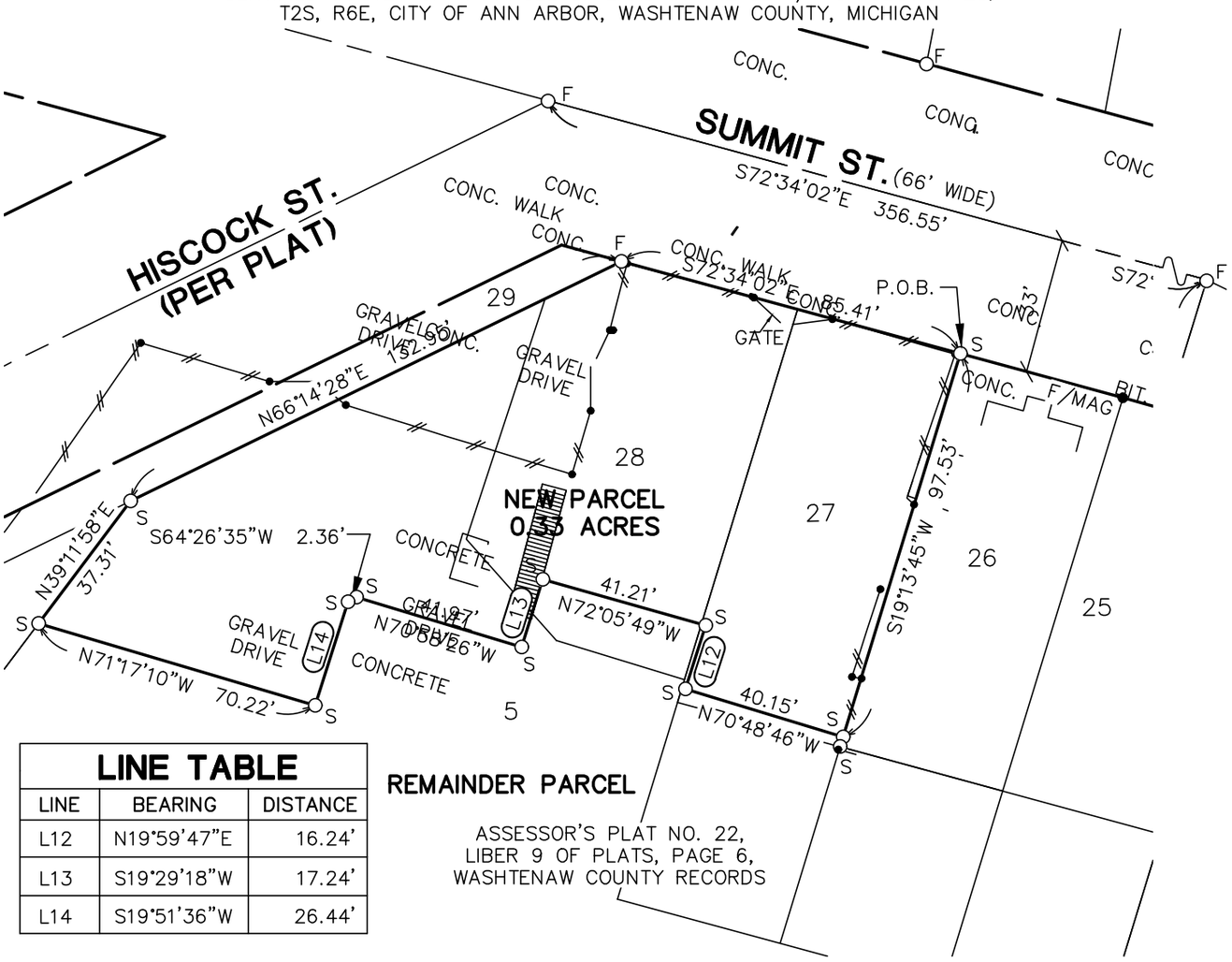
E-1

6-C-5621

415 W. WASHINGTON REFERENCE INFO - APPENDIX H

CERTIFIED SURVEY - NEW PARCEL

CERTIFIED SURVEY OF A PARCEL OF LAND IN THE SE 1/4 OF SECTION 20, T2S, R6E, CITY OF ANN ARBOR, WASHTENAW COUNTY, MICHIGAN



LINE TABLE		
LINE	BEARING	DISTANCE
L12	N19°59'47"E	16.24'
L13	S19°29'18"W	17.24'
L14	S19°51'36"W	26.44'

LEGAL DESCRIPTION - NEW PARCEL

A parcel of land in the Southeast 1/4 of Section 20, T2S, R6E, City of Ann Arbor, Washtenaw County, Michigan, being described as follows:

BEGINNING at the Northeast corner of Lot 27 of Assessor's Plat No. 22, recorded in Liber 9 of Plats, Page 6, Washtenaw County Records, Washtenaw County, Michigan;
thence S19°13'45"W 97.53 feet along the East line of said Lot 27;
thence N70°48'46"W 40.15 feet;
thence N19°59'47"E 16.24 feet along the West line of said Lot 27;
thence N72°05'49"W 41.21 feet;
thence S19°29'18"W 17.24 feet;
thence N70°58'26"W 41.97 feet;
thence S64°26'35"W 2.36 feet;
thence S19°51'36"W 26.44 feet;
thence N71°17'10"W 70.22 feet;
thence N39°11'58"E 37.31 feet along the Westerly line of Lot 5 of said Assessor's Plat No. 22;
thence N66°14'28"E 132.95 feet along the Southeasterly line of Lot 29 of said Assessor's Plat No. 22;
thence S72°34'02"E 85.41 feet along the South Right-of-Way line of Summit Street (66 feet wide) to the POINT OF BEGINNING. Being part of Lots 5, 27 and 28 of Assessor's Plat No. 22, located in the SE1/4 of Section 20, T2S, R6E, City of Ann Arbor, Washtenaw County, Michigan, containing 0.33 acres of land, more or less. Being subject to any easements and/or restrictions, if any.

REFER TO THE CITY OF ANN ARBOR ALLEN CREEK URBAN TRAIL MASTER PLAN FOR INFORMATION REGARDING THE ROLE OF 721 N. MAIN STREET IN THE POTENTIAL URBAN TRAIL CORRIDOR ROUTING

I HEREBY CERTIFY THAT I HAVE SURVEYED AND MAPPED THE ABOVE PARCEL HEREON DESCRIBED ON FEBRUARY 6, 2023 AND THAT THE RELATIVE POSITIONAL PRECISION OF EACH CORNER IS WITHIN THE LIMITS ACCEPTED BY THE PRACTICE OF PROFESSIONAL SURVEYING AND THAT ALL REQUIREMENTS OF P.A. 132 1970, AS AMENDED, HAVE BEEN COMPLIED WITH.

CLIENT: ANN ARBOR HOUSING	DATE: 2/6/2023
JOB NO.: **22179**	SHEET 3 OF 5
SECTION: 20 TOWN: 2S RANGE: 6E	SCALE: 1in.= 40 ft.
CITY OF ANN ABOR	BOOK: 1065
WASHTENAW COUNTY, MICHIGAN	BY: MST

Mark Vander Veen

MARK VANDER VEEN PS NO. 4001056788

STATE OF MICHIGAN
MARK VANDER VEEN
PROFESSIONAL SURVEYOR
No. 4001056788
LICENSED PROFESSIONAL SURVEYOR

MIDWESTERN CONSULTING
3815 Plaza Drive Ann Arbor, Michigan 48108
(734) 995-0200 • www.midwesternconsulting.com
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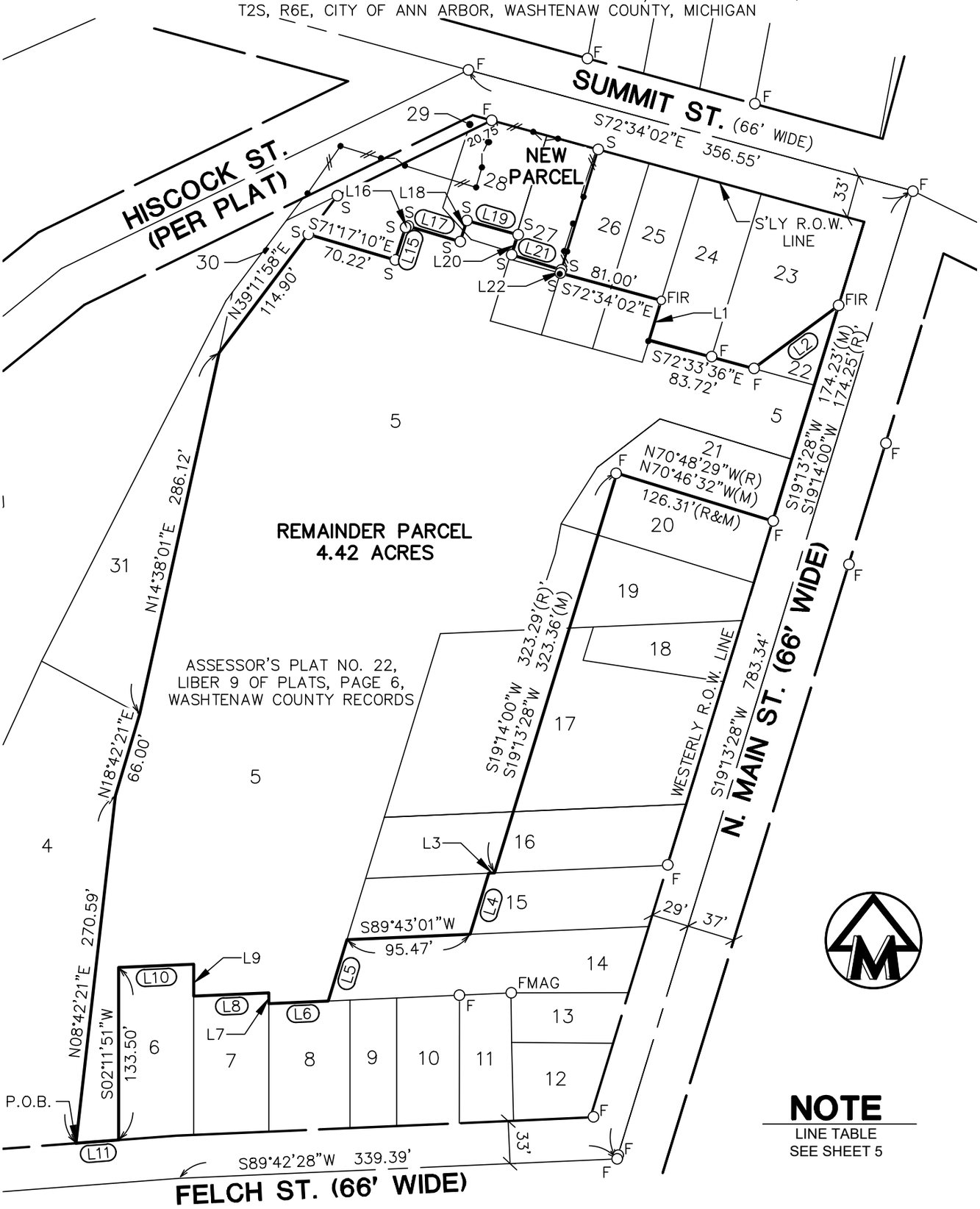
CERTIFIED SURVEY - REMAINDER PARCEL

CERTIFIED SURVEY OF A PARCEL OF LAND IN THE SE 1/4 OF SECTION 20,
T2S, R6E, CITY OF ANN ARBOR, WASHTENAW COUNTY, MICHIGAN



NOTE
LINE TABLE
SEE SHEET 5

I HEREBY CERTIFY THAT I HAVE SURVEYED AND MAPPED THE ABOVE PARCEL HEREON DESCRIBED ON FEBRUARY 6, 2023 AND THAT THE RELATIVE POSITIONAL PRECISION OF EACH CORNER IS WITHIN THE LIMITS ACCEPTED BY THE PRACTICE OF PROFESSIONAL SURVEYING AND THAT ALL REQUIREMENTS OF P.A. 132 1970, AS AMENDED, HAVE BEEN COMPLIED WITH.

CLIENT: ANN ARBOR HOUSING	DATE: 2/6/2023
JOB NO.: **22179**	SHEET 4 OF 5
SECTION: 20 TOWN: 2S RANGE: 6E	SCALE: 1in.= 100 ft.
CITY OF ANN ABOR	BOOK: 1065
WASHTENAW COUNTY, MICHIGAN	BY: MST

Mark Vander Veen

MARK VANDER VEEN PS NO. 4001056788

STATE OF MICHIGAN
MARK VANDER VEEN
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