FOURTH QUARTER 2022
GROUNDWATER MONITORING AND REMEDIAL STATUS REPORT

Part 2

Inactive Exxon Facility #28077
14258 Jarrettsville Pike
Phoenix, Maryland
Case Number 2006-0303-BA2
Facility I.D. No. 12342

Prepared By:
Kleinfelder
1745 Dorsey Road, Suite J
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Prepared For:
ExxonMobil Environmental &
Property Solutions Company
1400 Park Avenue, Building 7
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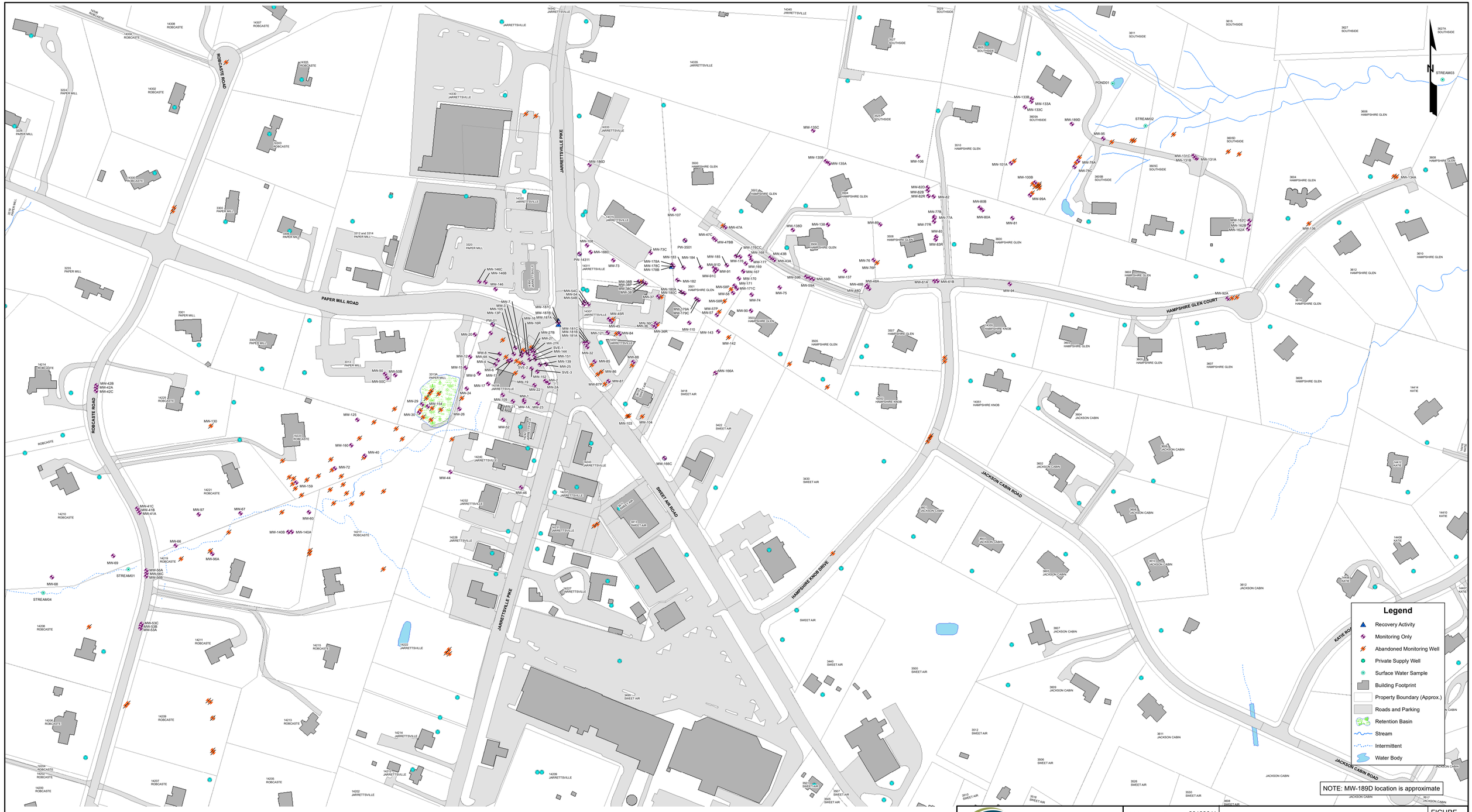
FIGURES



Legend

- Recovery Activity
- Monitoring Only
- Abandoned Monitoring Well
- Private Supply Well
- Surface Water Sample
- Building Footprint
- Property Boundary (Approx.)
- Roads and Parking
- Retention Basin
- Stream
- Intermittent
- Water Body

NOTE: MW-189D location is approximate

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PROJECT NO.	20193011
DRAWN:	2/12/2023
DRAWN BY:	R. Alvarez
CHECKED BY:	J. Frascarella

SITE PLAN
AS OF DECEMBER 31, 2022

INACTIVE EXXON FACILITY #28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND
BALTIMORE COUNTY

FIGURE
1

PW-3501
12/9/2022
ND(0.50)
ND(0.50)

MW-47C(212.5)
11/29/2022
ND(1.0)
8.6

MW-47BB
10/28/2022
ND(1.0)
ND(1.0)

MW-176
10/20/2022
ND(1.0)
ND(1.0)

MW-177
11/29/2022
ND(1.0)
1.3

MW-178B
10/20/2022
ND(1.0)
1.4

MW-183 [R]
12/9/2022
ND(1.0)
5.9

MW-91D
10/28/2022
ND(1.0)
ND(1.0)

MW-169
10/20/2022
ND(1.0)
ND(1.0)

MW-178C [R]
12/5/2022
0.77 J
59

MW-184
10/20/2022
0.85 J
5.2

MW-91C
12/6/2022
ND(1.0)
0.52 J

MW-91
10/28/2022
ND(1.0)
ND(1.0)

MW-170
10/20/2022
ND(1.0)
ND(1.0)

MW-182
10/20/2022
ND(1.0)
17

MW-75
11/1/2022
ND(1.0)
ND(1.0)

MW-58
10/28/2022
ND(1.0)
0.35 J

MW-179C(250)
11/29/2022
ND(1.0)
8.5

MW-57
10/28/2022
ND(1.0)
ND(1.0)

MW-189D(79)
12/21/2022
0.52 J
340

STREAM02
12/21/2022
ND(1.0)
ND(1.0)

MW-101A
11/1/2022
ND(1.0)
ND(1.0)

MW-99A
11/1/2022
ND(1.0)
ND(1.0)

MW-82D
12/6/2022
ND(1.0)
ND(1.0)

MW-82
11/1/2022
ND(1.0)
ND(1.0)

MW-82B
11/1/2022
ND(1.0)
2.2

MW-82R
11/1/2022
ND(1.0)
ND(1.0)

MW-89
11/1/2022
ND(1.0)
ND(1.0)

MW-138D [R]
12/28/2022
ND(1.0)
0.68 J

MW-188D(280.5)
12/28/2022
ND(1.0)
3.9

MW-73C [R]
12/9/2022
ND(1.0)
6.1

MW-137
11/15/2022
ND(1.0)
ND(1.0)

MW-76
11/15/2022
ND(1.0)
0.28 J

MW-59D
11/15/2022
ND(1.0)
ND(1.0)

MW-59B
10/28/2022
ND(1.0)
0.37 J

MW-38
10/28/2022
ND(1.0)
ND(1.0)

MW-54
10/27/2022
ND(1.0)
ND(1.0)

MW-38C [R]
12/6/2022
0.82 J
89

MW-54B
12/6/2022
31
290

MW-45R [R]
12/9/2022
ND(1.0)
ND(1.0)

MW-37
10/27/2022
ND(1.0)
ND(1.0)

MW-54C(212.5)
12/21/2022
27
58

MW-45 [R]
12/9/2022
ND(1.0)
8.2

MW-181A
11/1/2022
ND(1.0)
14

MW-32
11/1/2022
ND(1.0)
1.1

MW-121
12/9/2022
ND(1.0)
ND(1.0)

MW-181C(HS-D)
12/28/2022
ND(1.0)
19

JARRETTSVILLE PIKE

HAMPSHIRE GLEN COURT

JACKSON CABIN ROAD

SWEET AIR ROAD

HAMPSHIRE KNOB DRIVE

Legend

- Monitoring Only
- Recovery Well
- Not Sampled
- Private Supply Well

Groundwater Recovery Zones

- Zone 1
- Zone 2
- Zone 3
- Parcel Boundary (Approx.)
- Building Foot Prints
- Streams
- Water Bodies

Well ID
Sample Date
Benzene (µg/L)
MTBE (µg/L)

J = INDICATES AN ESTIMATED VALUE
ND(RL) = NOT DETECTED AT OR ABOVE THE LABORATORY REPORTING LIMIT (RL)
LABORATORY REPORTING LIMIT INCLUDED

NOTES:
1. LOCATIONS WITH DEPTH INTERVAL SAMPLES DISPLAY LABEL FOR MAX. MTBE CONCENTRATION. IF ALL INTERVALS ARE "ND(RL)", LABEL WILL BE DEFAULTED TO THE MOST SHALLOW INTERVAL

GROUNDWATER RECOVERY ZONES:

ZONE 1:
MW-37, MW-38, MW-38C, MW-54B, MW-73C, MW-74, MW-75, MW-82B, MW-82D, MW-82R, MW-89, MW-138D, MW-178C

ZONE 2:
MW-59B, MW-91C, MW-169, MW-170, MW-176, MW-183, MW-184, MW-185

ZONE 3:
MW-45, MW-45R, MW-121, MW-181A

N

0 45 90 180 Feet

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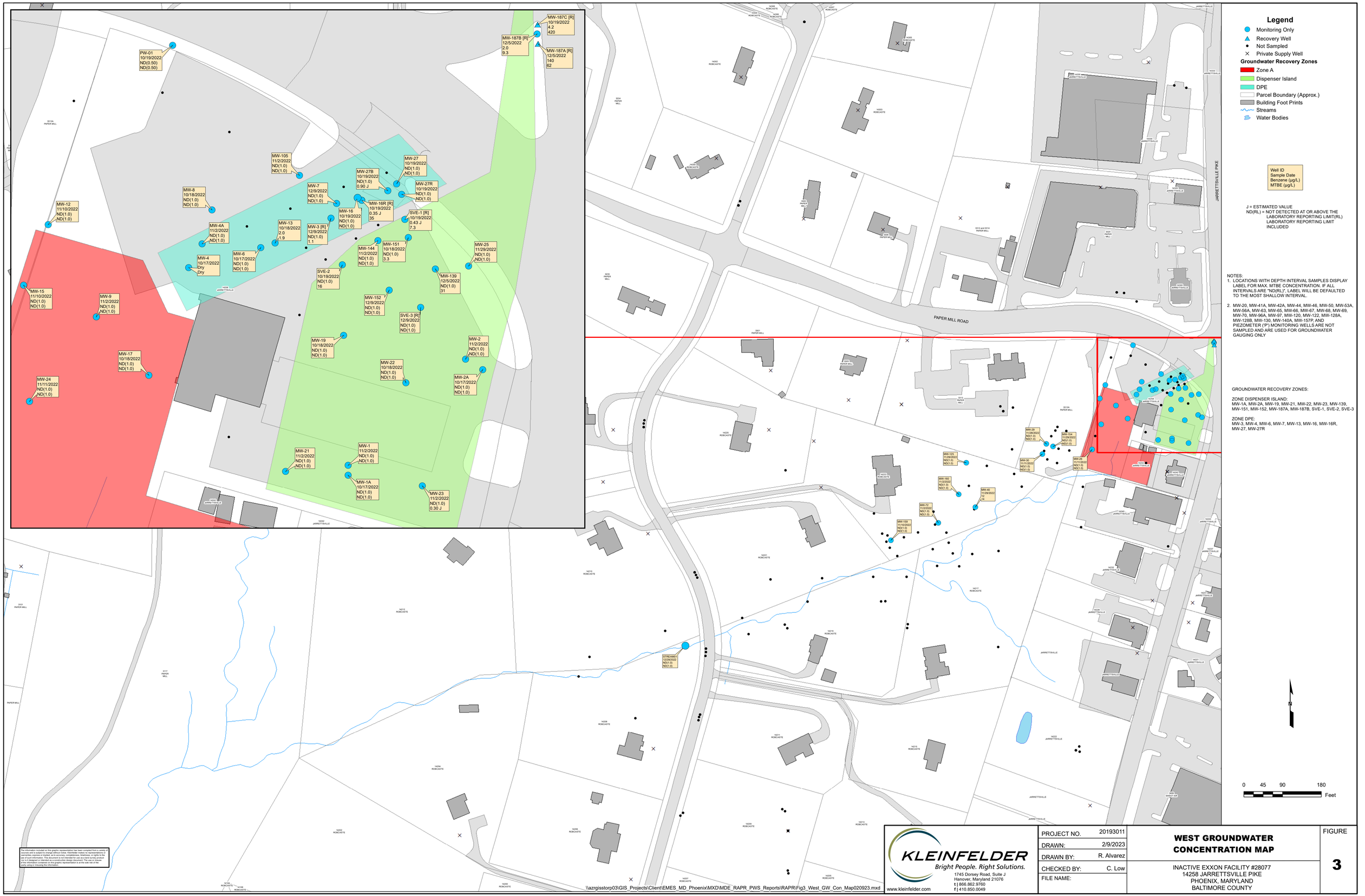
CHECKED BY:	J. Frascarella
FILE NAME:	

EAST GROUNDWATER CONCENTRATION MAP

INACTIVE EXXON FACILITY #28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND
BALTIMORE COUNTY

FIGURE
2


MW-187C [R]
10/19/2022
4.2
420
MW-187B [R]
12/5/2022
2.0
9.3
MW-187A [R]
12/5/2022
140
62
PW-01
10/19/2022
ND(0.50)
ND(0.50)
MW-105
11/2/2022
ND(1.0)
ND(1.0)
MW-27
10/19/2022
ND(1.0)
ND(1.0)
MW-27B
10/19/2022
ND(1.0)
0.90 J
MW-27R
10/19/2022
ND(1.0)
ND(1.0)
MW-8
10/18/2022
ND(1.0)
ND(1.0)
MW-7
12/9/2022
ND(1.0)
ND(1.0)
MW-16R [R]
10/19/2022
0.35 J
35
MW-16
10/19/2022
ND(1.0)
ND(1.0)
SVE-1 [R]
10/19/2022
0.43 J
7.3
MW-12
11/10/2022
ND(1.0)
ND(1.0)
MW-4A
11/2/2022
ND(1.0)
ND(1.0)
MW-13
10/18/2022
2.0
1.9
MW-3 [R]
12/9/2022
ND(1.0)
1.1
MW-4
10/17/2022
Dry
Dry
MW-6
10/17/2022
ND(1.0)
ND(1.0)
MW-144
11/2/2022
ND(1.0)
ND(1.0)
MW-151
10/18/2022
ND(1.0)
3.3
MW-25
11/29/2022
ND(1.0)
ND(1.0)
SVE-2
10/19/2022
ND(1.0)
16
MW-139
12/5/2022
ND(1.0)
31
MW-152
12/9/2022
ND(1.0)
ND(1.0)
SVE-3 [R]
12/9/2022
ND(1.0)
ND(1.0)
MW-15
11/10/2022
ND(1.0)
ND(1.0)
MW-9
11/2/2022
ND(1.0)
ND(1.0)
MW-19
10/18/2022
ND(1.0)
ND(1.0)
MW-2
11/2/2022
ND(1.0)
ND(1.0)
MW-17
10/18/2022
ND(1.0)
ND(1.0)
MW-22
10/18/2022
ND(1.0)
ND(1.0)
MW-24
11/11/2022
ND(1.0)
ND(1.0)
MW-2A
10/17/2022
ND(1.0)
ND(1.0)
MW-21
11/2/2022
ND(1.0)
ND(1.0)
MW-1
11/2/2022
ND(1.0)
ND(1.0)
MW-1A
10/17/2022
ND(1.0)
ND(1.0)
MW-23
11/2/2022
ND(1.0)
0.30 J
JARRETTSVILLE PIKE
PAPER MILL ROAD
MW-29
11/29/2022
ND(1.0)
ND(1.0)
MW-154
11/29/2022
ND(1.0)
ND(1.0)
MW-30
11/11/2022
ND(1.0)
ND(1.0)
MW-28
11/11/2022
ND(1.0)
ND(1.0)
MW-123
11/29/2022
ND(1.0)
ND(1.0)
MW-160
11/2/2022
ND(1.0)
ND(1.0)
MW-40
11/29/2022
12
1.6
MW-72
11/2/2022
ND(1.0)
ND(1.0)
MW-158
11/10/2022
ND(1.0)
ND(1.0)
STREAM01
12/29/2022
ND(1.0)
ND(1.0)
Legend
Monitoring Only
Recovery Well
Not Sampled
Private Supply Well
Groundwater Recovery Zones
Zone A
Dispenser Island
DPE
Parcel Boundary (Approx.)
Building Foot Prints
Streams
Water Bodies
Well ID
Sample Date
Benzene (µg/L)
MTBE (µg/L)
J = ESTIMATED VALUE
ND(RL) = NOT DETECTED AT OR ABOVE THE LABORATORY REPORTING LIMIT(RL)
LABORATORY REPORTING LIMIT INCLUDED
NOTES:
1. LOCATIONS WITH DEPTH INTERVAL SAMPLES DISPLAY LABEL FOR MAX. MTBE CONCENTRATION. IF ALL INTERVALS ARE "ND(RL)", LABEL WILL BE DEFAULTED TO THE MOST SHALLOW INTERVAL.
2. MW-20, MW-41A, MW-42A, MW-44, MW-46, MW-50, MW-53A, MW-56A, MW-63, MW-65, MW-66, MW-67, MW-68, MW-69, MW-70, MW-96A, MW-97, MW-120, MW-122, MW-128A, MW-128B, MW-130, MW-140A, MW-157P, AND PIEZOMETER ("P") MONITORING WELLS ARE NOT SAMPLED AND ARE USED FOR GROUNDWATER GAUGING ONLY
GROUNDWATER RECOVERY ZONES:
ZONE DISPENSER ISLAND:
MW-1A, MW-2A, MW-19, MW-21, MW-22, MW-23, MW-139, MW-151, MW-152, MW-187A, MW-187B, SVE-1, SVE-2, SVE-3
ZONE DPE:
MW-3, MW-4, MW-6, MW-7, MW-13, MW-16, MW-16R, MW-27, MW-27R
N
0 45 90 180
Feet
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DRAWN BY: R. Alvarez
CHECKED BY: C. Low
FILE NAME:
WEST GROUNDWATER CONCENTRATION MAP
INACTIVE EXXON FACILITY #28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND
BALTIMORE COUNTY
FIGURE
3

\\azrgisstorp01\GIS_Projects\Client\EMES_MD_Phoenix\MXD\MDE_RAPR_PWS_Reports\RAPR\Fig4_SamplingFreq_110520.mxd

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CHECKED BY:	J. Frascarella
FILE NAME:	

MDE APPROVED MONITORING POINT SAMPLING FREQUENCY

INACTIVE EXXON FACILITY #28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND
BALTIMORE COUNTY

FIGURE
4

MW-107
558.23
MW-108
562.37
MW-73
559.17
MW-178A
555.68
MW-178C [R]
532.52
MW-91C
547.11
MW-171
547.97
MW-179A
554.46
MW-187A [R]
545.40
MW-187C
[R]
545.78
MW-20
562.32
MW-105
561.20
MW-110
553.80
MW-166A
555.25
MW-4
DRY
MW-88
553.33
MW-87
554.26
MW-30
554.55
MW-24
555.23
MW-26
554.05
MW-72
540.40
MW-44
544.44
MW-159
538.61
MW-97
530.60
MW-67
535.64
MW-60
536.49
MW-41A
522.87
MW-140A
535.42
MW-56A
540.23
MW-59A
537.28
MW-76
535.39
MW-83
532.86
MW-61A
533.52
MW-94
533.48
MW-101A
530.19
MW-78A
526.79
MW-80A
531.94
MW-99A
527.76
MW-81
531.36
MW-92A
534.70
Legend
Recovery Activity
Monitoring Only
Abandoned Monitoring Well
Private Supply Well
Used to Construct Potentiometric Surface Contour
Potentiometric Contours (ft/msl)
Property Boundary (Approx.)
MW-180A 556.94
Well ID
Groundwater Elevation (ft/msl)
NOTE:
ft/msl = FEET ABOVE MEAN SEA-LEVEL
NM = NOT MEASURED
"B", "C", "D", "R", OR PUMPING WELLS WERE NOT USED FOR POTENTIOMETRIC CALCULATIONS
" * " INDICATES WELL WAS DRY AT TIME OF GAUGING. LISTED ELEVATION REPRESENTS ELEVATION OF WELL BOTTOM.
N
0 60 120 240 360 480
Feet

NOTE:

Potentiometric map uses all gauging data from 10/31/2022 and 11/01/2022.

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PROJECT NO.	20193011
DRAWN:	2/14/2023
DRAWN BY:	R. Alvarez
CHECKED BY:	J. Frascarella

POTENTIOMETRIC SURFACE MAP
GAUGING EVENT: FOURTH QUARTER 2022

INACTIVE EXXON FACILITY #28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND
BALTIMORE COUNTY

FIGURE

5

3635 SSide
3.8 01/10/2022
4.0 02/28/2022
3.9 03/14/2022
3.8 04/04/2022
1.6 05/03/2022
2.2 06/06/2022
1.4 07/11/2022
1.6 08/01/2022
3.7 09/06/2022
4.7 10/17/2022
7.6 11/11/2022
7.4 12/05/2022
7.6 01/09/2023

3627A SSide
37 01/10/2022
20 02/28/2022
45 03/14/2022
11 04/04/2022
8.7 05/03/2022
1.7 06/06/2022
14 07/11/2022
11 08/01/2022
23 09/06/2022
40 10/17/2022
52 11/11/2022
22 12/05/2022
17 01/09/2023

3504 Hampshire
ND(0.50) 03/30/2022
ND(0.50) 06/21/2022
0.12 J 09/26/2022
ND(0.50) 01/09/2023

3506 Hampshire
0.14 J 03/03/2022
0.13 J 06/21/2022
0.32 J 09/26/2022
0.20 J 01/03/2023

14307 Jarre
ND(0.50) 02/25/2022
ND(0.50) 06/10/2022
0.13 J 09/21/2022
ND(0.50) 01/06/2023

14301 Jarre
3.2 02/26/2022
0.46 J 06/21/2022
0.41 J 09/21/2022
0.11 J 01/03/2023

14258 Jarre
0.16 J 12/28/2021
ND(0.50) 02/25/2022
ND(0.50) 06/20/2022
ND(0.50) 08/01/2022
ND(0.50) 10/19/2022
ND(0.50) 01/09/2023

3313 Paper Mill
ND(0.5) 01/05/2022
0.42 J 06/21/2022
ND(0.5) 09/21/2022
0.97 01/10/2023

14242 Jarre (1)
ND(0.50) 03/02/2022
0.13 J 06/21/2022
ND(0.50) 09/21/2022
ND(0.50) 01/03/2023

14240 Jarre (1)
0.31 J 03/07/2022
0.32 J 09/28/2022

14217 Robca
1.4 03/10/2022
1.3 09/26/2022
1.6 01/06/2023

LEGEND

- Private Supply Well
- Sample Location w/ MTBE Detection Above Estimated Value in Current Quarter
- Property Boundaries (Approx.)
- Service Station Property Boundary
- Private Supply Well with EM POET
- Off-Site Private Supply Well

Property Address (Abrv.)
MTBE (µg/L) - Sample Date

J = INDICATES AN ESTIMATED VALUE
ND(RL) = NOT DETECTED AT OR ABOVE THE LABORATORY REPORTING LIMIT (RL)
LABORATORY REPORTING LIMIT INCLUDED

NOTE:
1. DATA SHOWN FOR THE LAST YEAR OF RESULTS.
2. FOR THOSE LOCATIONS WITH POINT OF ENTRY TREATMENT (POET) SYSTEMS, THE RESULTS SHOWN REPRESENT INFLUENT ("PI") SAMPLE RESULTS ONLY (i.e. COLLECTED PRIOR TO THE POET SYSTEM).
3. 14301 JARRETTSVILLE PIKE WAS CONNECTED TO THE POTABLE SUPPLY WELL AT 3410 SWEET AIR ROAD ON 08/15/06. THE RESULTS SHOWN ON THIS MAP FOR 14301 JARRETTSVILLE PIKE WITH SAMPLE DATES AFTER 08/15/06 ARE FROM THE WELL AT 3410 SWEET AIR ROAD. THE RESULTS SHOWN ON THIS MAP FOR 3410 SWEET AIR ROAD ARE FOR SAMPLING EVENTS PRIOR TO ITS CONNECTION TO 14301 JARRETTSVILLE PIKE.

N

0 100 200 400 Feet
0 30 60 120 Meters

FIGURE 6
MTBE PRIVATE SUPPLY WELL RESULTS MAP

INACTIVE EXXON FACILITY #28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND

DRAWN BY:	RMA	SCALE:	1:2,500
REVISED BY:	RMA	PROJECT NO:	20193011
DATE:	2/9/2023	SOURCE: CONTACT KLEINFELDER FOR METADATA	
CHECKED BY:	JF		

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Legend

- Monitoring Only
- Dual Phase Extraction (DPE)
- Pneumatic Pump
- Soil Vapor Extraction (SVE)
- SVE/Pneumatic Pump
- Electric Pump
- Private Supply Well
- Surface Water Sample
- Abandoned Well
- GW Discharge
- GW Recovery Piping
- GW/SVE Recovery Piping
- SVE Recovery Piping
- Tank Field
- Tank Field Piping
- Disconnected Piping
- GW Recovery System
- SVE System
- Fractionating Tank
- Liquid Carbon Filter
- Vapor Carbon Filter
- Electrical Equipment

Remediation Systems

2. Influent Tank and Pumps
4. ESD DPE Claw (Replaced MLE DPE Claw)
5. SW Manifold
8. Effluent Tank and Pumps
10. HDD Conduit Containing
    - Communication Conduit
    - Influent Water Lines (NE)
    - Effluent Water Lines (NE)
    - Spare Lines
11. NE Air and Water Manifold Vaults
12. Compressors for Pneumatic Pump
13. Groundwater Treatment: Carbon Adsorbers

Note: Pipe and Remediation System Locations and Scale are Approximate.

NE OUTFALL

SW OUTFALL

PAPER MILL ROAD

ROBCASTE ROAD

JARRETTSVILLE PIKE

HAMPSHIRE GLEN COURT

JACKSON CABIN ROAD

HAMPSHIRE KNOB DRIVE

SWEET AIR ROAD

KATIE ROAD

NOTE: MW-189D Location is Approximate

0 70 140 280 420 560 Feet

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DRAWN:	2/9/2023
DRAWN BY:	R. Alvarez
CHECKED BY:	J. Frascarella

REMEDIATION LAYOUT AS OF DECEMBER 31, 2022

INACTIVE EXXON FACILITY #28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND
BALTIMORE COUNTY

FIGURE 7

APPENDIX A

FULL HISTORY OF REMEDIAL SYSTEM ACTIVITIES/MODIFICATIONS

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APPENDIX A – HISTORY OF REMEDIAL SYSTEM ACTIVITIES/MODIFICATIONS

- February 17, 2006 – Onset of groundwater recovery activities using mobile remediation equipment.
- February 2006 to September 2006 – Temporary mobile groundwater recovery and treatment system; three SVE systems in the southwest quadrant - Flame Oxidizer 750, Bisco Dual Claw, and Bisco Liquid Ring Pump (LRP) DPE system; and, four SVE systems in the northeast quadrant - Flame Oxidizer 500, Airtech LRPs, MLE Claw 2, and ThermCat 500. Equipment operation and performance is detailed in the IRM Plan and Updated IRM Plan. Bisco LRP was shutdown in July 2006 and replaced with the MLE DPE Claw in August 2006, which extracts soil vapors and groundwater from the service station property extraction wells.
- October 2006 to March 2007 – Temporary groundwater treatment systems operated in the northeast quadrant; these were shutdown when the integrated groundwater treatment system was brought online.
- October 2006 to March 2008 – Temporary soil vapor extraction equipment was replaced with equipment designed for prolonged use at the site.
- February 5, 2007 – All recovered groundwater is treated on the service station property utilizing a combination of air stripping, a fluidized bed bioreactor, and liquid phase GAC.
- February 9, 2007 – ThermCat 500 (thermal oxidizer) was shutdown and was replaced by the Flame Oxidizer 500 SVE Blower extracting vapor from extraction wells in the northeast quadrant on 14307 Jarrettsville Pike, 3501 Hampshire Glen Court, and 3506 Hampshire Glen Court.
- February 9, 2007 – ESD Dual Claw SVE system was brought online, operating on wells formerly operated by the Flame Oxidizer 500 SVE Blower, extracting vapor from extraction wells in the northeast quadrant on 14301 Jarrettsville Pike and 14307 Jarrettsville Pike.
- May 31, 2007 – Temporary DPE system, Airtech LRPs (located on the Sweet Air Road property in the northeast quadrant) was shutdown, and replaced with the Bisco LRP DPE system (formerly used on the Service Station Property), extracting vapor and groundwater from extraction wells on 14307 Jarrettsville Pike and 3503 Hampshire Glen Court.
- May 31, 2007 – Flame Oxidizer 500 vapor treatment unit was shutdown (SVE Blower still operated) because soil vapor is below SVE general permit discharge limits and the vapors are now directed through vapor phase GAC prior to discharge to the atmosphere.
- May 31, 2007 – Flame Oxidizer 750 vapor treatment unit was shutdown (SVE Blower still operated) because soil vapors are below SVE general permit discharge limits and the vapors are now directed through vapor phase GAC prior to discharge to the atmosphere.
- August 9, 2007 – The Bisco LRP was relocated from 3410 Sweet Air Road to 3418 Sweet Air Road (northeast quadrant).
- August 10, 2007 – Flame Oxidizer 500 was taken offline, and transported offsite.

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- August 10, 2007 – ESD Dual Claw Skid I was brought online to replace the Flame Oxidizer 500, extracting vapors from the extraction wells in the northeast quadrant on 14307 Jarrettsville Pike, 3501 Hampshire Glen Court, and 3506 Hampshire Glen Court and treating the vapors with vapor phase GAC.
- October 4, 2007 – Flame Oxidizer 750 was taken offline and transported offsite. Piping retrofit and installation of the ESD Tri-Lobe was initiated in the former Flame Oxidizer 750 area.
- October 12, 2007 – Bisco LRP was taken offline due to liquid ring pump failure, SVE wells operated by the Bisco LRP were re-directed to the ESD Dual Claw and ESD Dual Claw Skid I, and pneumatic pumps were added to MW-36, MW-74, and MW-75.
- October 31, 2007 – ESD Tri-Lobe SVE system was brought online to replace the Flame Oxidizer 750, extracting vapors from extraction wells on the service station property and treating vapors with vapor phase GAC.
- February 18, 2008 – MLE Claw 2 was taken offline and transported offsite, extracted vapors were temporarily re-directed to the ESD Dual Claw Skid I while installation of replacement system was initiated.
- March 11, 2008 – Northeast Bisco Dual Claw was brought online to replace the MLE Claw 2 (located on the 3508 Hampshire Glen Court property), extracting vapors from extraction wells on 3506, 3508, and 3600 Hampshire Glen Court, and treating vapors with vapor phase GAC on 3418 Sweet Air Road.
- March 31, 2008 – New recovery wells, MW-16R and MW-27R, were connected to the groundwater remediation system and brought online for both groundwater extraction using pneumatic pumps (GWP&T) and soil vapor extraction (SVE).
- May 7, 2008 – Two SW groundwater storage fractionating tanks were transported offsite.
- May 12, 2008 – New air compressor installed, Plant Air Compressor, supplying air to all SW and NE pneumatic pumps. Former air compressors remain in place as back-ups.
- June 10, 2008 – Effluent groundwater fractionating tank (T702) emptied into effluent fractionating tank (T701) and transported offsite.
- June 17, 2008 – Monitoring well MW-89 was brought online for both GWP&T and SVE.
- August 13, 2008 – Monitoring well MW-121 was connected to the groundwater remediation system and brought online for both GWP&T and SVE.
- September 10, 2008 – Monitoring well MW-45R was connected to the groundwater remediation system and brought online for both GWP&T and SVE.
- January 19-23, 2009 – Three SVE pilot test wells were installed on the service station property to further evaluate onsite SVE recovery in the former UST field area.
- February 6, 2009 – New air compressor installed as a back-up to the Plant Air Compressor; capable of supplying air to all SW and NE pneumatic pumps
- March 3, 2009 – Recovery well MW-36 converted from DPE to GWP&T and SVE.
- April 17, 2009 – Monitoring well MW-58R was connected to the groundwater remediation system and brought online for both GWP&T (NE02 Zone) and SVE (ESD Dual Claw Skid). Groundwater recovery and soil vapor extraction was re-started on MW-38.
- May 26, 2009 – Monitoring wells, MW-169, MW-170, and MW-171 were connected to the groundwater remediation system and brought online for both GWP&T (NE01) and SVE (ESD Dual Claw Skid).
- November 11, 2009 – Bisco Dual Claw SVE system permanently taken offline.

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- November 13, 2009 – Recovery well, SVE-3, was transitioned to all-season below grade piping and reconnected to the groundwater recovery system.
- December 15, 2009 – Recovery wells, MW-78R and MW-100B, were taken offline for GWP&T. Northeast Bisco Dual SVE system permanently taken offline.
- February 18, 2010 – Recovery well, MW-34, was taken offline for GWP&T.
- March 17, 2010 – Recovery well, MW-33, was taken offline for GWP&T.
- April 19, 2010 – Recovery well, MW-51, was taken offline for GWP&T.
- May 24, 2010 – Recovery well, MW-124, was taken offline for GWP&T.
- May 28, 2010 – Monitoring well MW-91C was connected to the groundwater remediation system using temporary above grade piping; and brought online for GWP&T.
- June 1, 2010 – Monitoring well MW-54 was connected to the groundwater remediation system using temporary below grade piping; and brought online for GWP&T.
- June 22, 2010 – Recovery well MW-71 was taken offline for GWP&T.
- July 7, 2010 – Monitoring well SVE-1 was connected to the groundwater remediation system using temporary above grade piping; and brought online for GWP&T.
- September 20, 2010 – Begin LGAC-only treatment for low-concentration groundwater stream. Air stripper is maintained onsite.
- September 25, 2010 – Recovery well MW-54 was transitioned to all-season below grade piping.
- September 29, 2010 - Monitoring well MW-176 was connected to the groundwater remediation system using temporary above grade piping; and brought online for GWP&T.
- December 2, 2010 – Recovery wells MW-91C, MW-176, and SVE-1 were transitioned to all-season below grade piping.
- December 28, 2010 – Monitoring well MW-36R was connected to the groundwater remediation system and brought online for GWP&T. Recovery well MW-36 was taken offline for GWP&T.
- December 29, 2010 – Monitoring well MW-178C was connected to the groundwater remediation system and brought online for GWP&T.
- May 20, 2011 – Recovery well MW-28 was taken offline for GWP&T.
- June 15, 2011 – Recovery well MW-111 was taken offline for GWP&T.
- July 15, 2011 – Recovery well MW-102 was taken offline for GWP&T.
- August 15, 2011 – Recovery well MW-123 was taken offline for GWP&T.
- September 15, 2011 – Recovery well MW-113 was taken offline for GWP&T.
- October 12, 2011 – Recovery well MW-60 was taken offline for GWP&T.
- April 24, 2012 – Pneumatic pump in recovery well MW-171 identified as not operating properly and lodged in place inside the well borehole. Currently being used for monitoring only and “grab” sampling.
- May 15, 2012 – Monitoring well MW-54B was connected to the groundwater remediation system and brought online for GWP&T.
- June 20, 2012 – Monitoring well MW-139 was connected to the groundwater remediation system and brought online for GWP&T.
- July 20, 2012 – Monitoring well MW-181B was connected to the groundwater remediation system and brought online for GWP&T.

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- July 31, 2012 – Monitoring wells MW-183, MW-184, and MW-185 were connected to the groundwater remediation system and brought online for GWP&T.
- August 31, 2012 – ESD TriLobe SVE system taken offline due to high temperature.
- September 6, 2012 – ESD TriLobe SVE system repaired and resumed operations.
- September 20, 2012 – Monitoring well MW-38C was connected to the groundwater remediation system and brought online for GWP&T.
- August 21, 2013 – Exposed piping was removed from a stream bed in southwest in accordance with MDE approved work plan.
- September 17, 2013 – Monitoring well SVE-2 was connected and activated to the groundwater remediation system using temporary above grade piping.
- October 2, 2013 – Soil vapor extraction initiated at SVE-2.
- October 10, 2013 – ESD Dual Claw Trailer and ESD Dual Claw Skid I SVE systems permanently taken offline.
- November 19, 2013 – Temporary groundwater recovery and soil vapor extraction was ceased at SVE-2 following completion of a two-month evaluation period using above grade piping.
- November 19, 2013 – Recovery wells MW-25 and MW-80A taken offline for GWP&T.
- December 13, 2013 – Recovery wells MW-80B and MW-109 taken offline for GWP&T.
- January 16, 2014 – Recovery well MW-31 was taken offline for GWP&T.
- February 12, 2014 – Recovery well MW-49 was taken offline for GWP&T.
- March 12, 2014 – Recovery well MW-119 was taken offline for GWP&T.
- April 11, 2014 – Recovery wells MW-55 and MW-112 were taken offline for GWP&T.
- May 12, 2014 – Recovery well MW-117 was taken offline for GWP&T.
- May 13, 2014 – MLE DPE Claw system permanently taken offline.
- June 18, 2014 – ESD DPE Claw system (former ESD Dual Claw Trailer in the Northeast) was brought online as a replacement for MLE DPE Claw.
- June 20, 2014 – Monitoring well SVE-2 was connected to the groundwater remediation system with all-weather below-grade piping, and brought online for GWP&T and SVE.
- September 22, 2014 – Monitoring well MW-82B was connected to the groundwater remediation system with all-weather below-grade piping, and brought online for GWP&T.
- November 3, 2014 – Monitoring well MW-187B was connected to the groundwater remediation system with all-weather below-grade piping, and brought online for GWP&T.
- March 25, 2015 – Monitoring well MW-187A was connected to the groundwater remediation system with all-weather below-grade piping, and brought online for GWP&T.
- April 14, 2015 – Bioreactor taken offline, subsequently approved for decommissioning on June 16, 2015.
- May 6, 2015 – Recovery wells MW-24, MW-26, MW-29, MW-30, MW-35, MW-52, and MW-154 were taken offline for GWP&T.
- June 15, 2015 – Soil vapor extraction initiated at MW-187A.
- July 21, 2015 – Electric pump in monitoring well MW-82B replaced with pneumatic pump.
- August 11, 2015 – Soil vapor extraction initiated at MW-187B.
- August 31, 2015 - Recovery wells MW-40, MW-72, MW-116, MW-118, MW-126, MW-127, and MW-156 were taken offline for GWP&T.

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- September 18, 2015 – Soil vapor extraction discontinued from MW-187A.
- September 21, 2015 – Removal of FLUTe™ liner from MW-78C.
- May 11, 2016 – Soil vapor extraction resumed at MW-187A.
- May 18, 2016 - well MW-151 was taken offline for GWP&T.
- June 6, 2016 – Begin carbon only treatment for all groundwater recovery zones.
- July 26, 2016 – Install new HDPE underground piping and valve manifolds within subsurface vaults to permanently bypass the above-grade groundwater processing and storage equipment located in the northeast. Permanently remove northeast lift station, northeast tank 201, and northeast manifold room from GWP&T operation.
- October 27, 2016 – Remove offline LGAC vessels from NE remediation section.
- December 7, 2016 – Recovery well MW-32 converted to a monitoring well only after the water return line failed due to corrosion.
- December 2016 – Remove remaining above-grade equipment and components from the NE remediation section.
- April 12, 2017 – Tri-Lobe SVE system taken offline indefinitely; SVE wells MW-7, MW-16R, MW-27R, MW-187A and MW-187B connected to the ESD DPE law system.
- June 23, 2017 – Pump removed from MW-139 to replace non-functioning pump in MW-187B.
- September 19, 2017 – Pneumatic pump installed in MW-168 for temporary pump test, running off of air supply and water return from the MW-169 vault.
- October 10, 2017 – Pumps in recovery wells MW-178C and MW-183 were lowered an additional 50 feet to a total depth of 200 feet below grade.
- October 23 and 24, 2017 – Recovery well MW-181B was converted into a monitoring well. Monitoring well MW-181A was converted into a recovery well.
- December 29, 2017 – Pump and temporary above-grade piping connections removed from MW-168, terminating temporary pumping test.
- February 26, 2018 – One of the southwest influent tanks (T-102) was removed from site, all influent (untreated water) is now stored in remaining tank T-202.
- April 16, 2018 – Pneumatic pump reinstalled in MW-168, to continue pumping test longer-term.
- July 30, 2018 – MW-59D converted into a monitoring well as part of the MDE-approved Northeast sequential recovery well conversion. MW-151 pump removed from service.
- August 3, 2018 – MW-59B pump removed from service, MW-59D redeveloped.
- August 13, 2018 – Recovery well MW-57 converted into a monitoring well as part of the MDE-approved Northeast sequential recovery well conversion. Other wells approved for conversion had pumps removed as previously reported, including MW-181B removed on 10/23/17, MW-76 removed on 5/21/18, MW-59D removed on 7/30/18, MW-32 removed 12/7/17, and MW-43A removed on 1/31/13.
- August 30, 2018 – MW-59B pump reinstalled.
- September 11, 2018 – Subterranean leak was identified at location of abandoned well MW-51. Air turned off to southwest zones A-E.

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- September 12 through 13, 2018 – Recovery wells MW-110, MW-85, MW-77A were converted into monitoring wells and redeveloped as part of the MDE-approved Northeast sequential recovery well conversion. Also scheduled for monitoring well conversion in September was MW-58, although the pump for MW-58 had already been removed on 3/28/18 due to the pump not functioning properly.
- September 27, 2018 - Pump and temporary above-grade piping connections removed from MW-168, terminating temporary pumping test.
- October 8, 2018 – Recovery wells MW-36R, MW-77R, MW-87, and MW-137 were converted into monitoring wells and redeveloped as part of the MDE-approved Northeast sequential recovery well conversion.
- October 16, 2018 – Pump installed in MW-187C to a depth of 150' bgs.
- October 26, 2018 – Pumps were removed from MW-9 and MW-17.
- November 6, 2018 - Recovery well MW-77B was converted into a monitoring well and redeveloped as part of the MDE-approved Northeast sequential recovery well conversion.
- November 7, 2018 – Recovery wells MW-58R, MW-82, and MW-84 were converted into monitoring wells and redeveloped as part of the MDE-approved Northeast sequential recovery well conversion.
- December 5, 2018 – MW-188D Packer removed and purged of 275 gallons.
- December 5 through 20, 2018 – New remediation system components (influent tank T-100, effluent tank T-200, transfer pumps and totalizers) installed in former service bay area and tested.
- January 3, 2019 – Commissioning of new groundwater treatment system results in all recovered water being treated through new influent/effluent tanks, transfer pumps and totalizers.
- January 18, 2019 – Former influent and effluent frac tanks dewatered and fully removed from service.
- February 11, 2019 – Former discharge trailer and southwest lift station decommissioned and removed from the site.
- March 5, 2019 – Recovery well pump in MW-54B deepened to 115' below top of casing and recovery well pump in MW-38C deepened to 150' below top of casing with MDE approval.
- April 8, 2019 – Recovery well pump installed to 150' below top of casing in MW-138D and connected to the recovery network.
- April 26, 2019 - Recovery wells MW-169 and MW-185 were converted into monitoring wells and redeveloped as part of the MDE-approved Northeast sequential recovery well conversion.
- May 3, 2019 – Recovery well pump installed to 150' below top of casing in MW-82D.
- May 10, 2019 – Recovery well pump installed to 150' below top of casing in MW-73C; temporary above-ground piping connections were made to the vault in MW-178C for on-going pump test.
- May 22 through June 5, 2019 – A total of 48 monitoring wells were abandoned in accordance with the MDE-approved *Groundwater Monitoring Reduction and Well Abandonment Request* submitted on January 22, 2019.
- June 10 through 12, 2019 – Recovery wells MW-1A, MW-6, MW-91C, and MW-152 were converted to monitoring wells and redeveloped as part of the MDE-approved sequential recovery well conversion.
- July 8 through 12, 2019 – Recovery wells MW-22 and MW-74 were converted to monitoring wells and redeveloped as part of the MDE-approved sequential recovery well conversion.

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- July 30 through 31, 2019 – Recovery wells MW-21, MW-2A, and MW-38 were converted to monitoring wells and redeveloped as part of the MDE-approved sequential recovery well conversion.
- October 1 through 2, 2019 – Recovery wells MW-19, MW-23, MW-75, and MW-170 were converted to monitoring wells and redeveloped as part of the MDE-approved sequential recovery well conversion.
- October 29, 2019 – MW-138D and MW-187C were lowered 20' to increase groundwater recovery.
- November 5, 2019 – MW-73C pump taken offline in advance of winter and rebound testing. Sparge device installed to depth of 150' in MW-91C to test potential remedial effectiveness in bedrock aquifer.
- March 10, 2020 – Recovery well pump installed to 150' below top of casing in MW-73C; temporary above-ground piping connections were made to the vault in MW-178C for on-going pump test.
- April 20, 2020 – Sparge device removed from MW-91C upon conclusion of six month test period.
- April 28, 2020 – SVE/DPE system taken offline after receiving approval from the MDE.
- May 5, 2020 – Former DPE wells MW-3, MW-13, and MW-27 were converted into pneumatic recovery wells. Pneumatic recovery well MW-4 taken offline, with its pump being used to initiate recovery in MW-3. Monitoring well MW-16 was converted into a pneumatic recovery well.
- June 30, 2020 – Recovery wells MW-37, MW-82R, and MW-89 were converted to monitoring wells and redeveloped as part of the MDE-approved sequential recovery well conversion.
- July 1, 2020 – Recovery wells MW-27R and MW-121 were taken offline as part of the MDE-approved sequential recovery well conversion.
- July 21 to July 23, 2020 – Monitoring wells MW-30P, MW-34P, MW-36P, MW-37P, MW-38P, MW-45P, MW-57P, MW-58P, MW-58R, MW-63, MW-76P, MW-85P, MW-103, MW-119, MW-122, MW-130, MW-132A, MW-134A, MW-134B, MW-136, MW-142, MW-145P, MW-150A, MW-156 and MW-157P were abandoned as part of the MDE-approved monitoring well reduction and abandonment plan.
- July 23, 2020 – Recovery well MW-183 depth of pump changed from 200 feet below grade to 150 feet below grade per MDE request.
- July 27, 2020 – Monitoring wells MW-84P, MW-86, MW-87P and MW-104 were abandoned as part of the MDE-approved monitoring well reduction and abandonment plan.
- August 3 to August 5, 2020 – Recovery wells MW-7, MW-13, MW-59B, MW-82B, MW-151, MW-176, MW-184 and SVE-2 were taken offline as part of the MDE-approved sequential recovery well conversions.
- December 15, 2020 – Recovery well MW-73C pump taken offline in advance of winter.
- March 29, 2021 – Recovery well MW-73C pump taken online after winter.
- June 28, to June 30, 2021 – Recovery wells MW-16, MW-27, MW-54B, MW-82D, and MW-181A were taken offline as part of an MDE-approved sequential recovery well conversion.
- March 11, 2022 – Groundwater pump and treat system taken offline for the Recovery Well Cycling test.
- May 27, 2022 – Groundwater pump and treat system brought online for a two week period.
- June 8, 2022 – Groundwater pump and treat system taken offline to resume the Recovery Well Cycling test.
- August 31, 2022 – Recovery pumps reinstalled, however the system compressor was non-functional and the groundwater recovery system remained offline.
- October 20, 2022 – New compressor installed and system restarted. Groundwater pump and treat system resumed operation with recovery wells at MW-187A, MW-187C, and MW-178C online.

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- November 21, 2022 – Groundwater pump and treat system taken offline to continue cycling test.
- December 9, 2022 – Groundwater pump and treat system brought back online with MW-187A, MW-187C and MW-178C operational.

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