RONALD H. ALBERTI
810 Third Street
Beaver, PA 15009

Receipt

Receipt Date: 09/17/2024 03:57:41 PM
RECEIPT # 20241089568

Recording Clerk: PG
Cash Drawer: CASH1
Rec'd Frm:

412-716-0079

Instr#: 3701939
DOC: ENVIRONMENTAL COVENANT LAW
OR Party: SHELL CHEMICAL APPALACHIA LLC
EE Party: SHELL CHEMICAL APPALACHIA LLC

Recording Fees	
Cover Page	$2.00
Recording Fee	$13.00
Writ Tax	$0.50
Record Improvement Fund	$5.00
Additional Pages	$180.00
DOCUMENT TOTAL: ---->	$200.50

Receipt Summary	
Document Count: 1	
TOTAL RECEIPT: ---->	$200.50
TOTAL RECEIVED: ---->	$200.50
CASH BACK: ---->	$0.00

PAYMENTS	
Cash ->	$200.50

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office

September 4, 2024

Delivered via First Class Mail

Attn: Kimberly Kaal
Shell Chemical Appalachia LLC
300 Frankfort Road
Monaca, PA 15061

Re: Approval of Environmental Covenants
Shell Polymers Monaca Site
Department PF # 782002
Department LRP ID # 5-4-947-19345
300 Frankfort Road
Potter Township, Allegheny County

Dear Kimberly Kaal,

The Department of Environmental Protection (DEP) has reviewed the Environmental Covenant (EC) submitted for the above referenced site. This EC was submitted to the DEP in accordance with Title 25, Chapter 253 of the PA Code, Administration of the Uniform Environmental Covenants Act (UECA). UECA and accompanying regulations provide a standardized process for creating, documenting, and assuring the enforceability of activity and use limitations on contaminated properties involving most engineering and institutional controls used to achieve Act 2 standards.

The DEP has approved the EC. The signed EC is enclosed. As stated in paragraph 9 of the EC, the EC is to be recorded within 30 days of this letter. In addition, notifications of recordation are to be sent to the DEP and the other entities named in paragraph 9 within 90 days of this letter.

Please submit the DEP's copy as a PDF to our Public Upload portal at: https://greenport.pa.gov/ePermitPublicAccess/PublicSubmission/Home. Enter "ENVIRONMENTAL COVENANT" under SUBMISSION TYPE and select the most appropriate type for your submittal.

If you have questions regarding this correspondence, please contact me at shensel@pa.gov or 412-442-4165.

Sincerely,

Steven Hensel

Steve Hensel
Environmental Protection Compliance Specialist
Environmental Cleanup and Brownfields Program

Cc: Beaver County Conservation District
Potter Township
T. Buchan

RA-EpBeaverCCD@pa.gov , secretary@pottertwp.comcastbiz.net

Environmental Covenant

When recorded, return to:
Environmental Manager
Shell Polymers Monaca
300 Frankfort Road
Monaca PA 15061

The County Parcel Identification No. of the Property is: Ten (10) Tax Parcels of Land in the Townships of Potter and Center, County of Beaver (See attached List of Tax Parcel Identification Numbers)
GRANTOR: Shell Chemical Appalachia LLC
PROPERTY ADDRESS: 300 Frankfort Road, Monaca, PA

ENVIRONMENTAL COVENANT

This Environmental Covenant is executed pursuant to the Pennsylvania Uniform Environmental Covenants Act, Act No. 68 of 2007, 27 Pa. C.S. §§ 6501 – 6517 (UECA). This Environmental Covenant subjects the Property identified in Paragraph 1 to the activity and/or use limitations in this document. As indicated later in this document, this Environmental Covenant has been approved by the Pennsylvania Department of Environmental Protection (Department).

1. **Property affected**. The property affected (Property) by this Environmental Covenant is located in the Township of Potter, County of Beaver, Commonwealth of Pennsylvania.

The postal street address of the Property is: 300 Frankfort Road, Monaca, PA.

The Tax Parcel Identification Numbers of the parcels comprising the Property and the latitude and longitude of the approximate center of each are:

• TP# 73-163-0200.08Z	40° 40' 24.25" N	80° 20'17.30" W
• TP# 73-163-0200.009	40° 40' 15.05" N	80° 20'11.45" W
• TP# 73-173-0250.006	40° 39' 59.73" N	80° 20'22.83" W
• TP# 73-173-0249.002	40° 39' 56.47" N	80° 20'21.10" W
• TP# 73-173-0247.000	40° 39' 55.34" N	80° 20'17.40" W
• TP# 73-163-0200.000	40° 40' 01.52" N	80° 19'56.46" W
• TP# 73-163-0188.000	40° 39' 55.89" N	80° 19'41.50" W
• TP# 56-173-0242.000	40° 39' 49.78" N	80° 19'31.38" W
• TP# 73-163-0200.005	40° 40' 35.27" N	80° 19'37.29" W
• TP# 73-163-0200.006	40° 40' 39.39" N	80° 19'42.12" W
• TP# 73-163-0200.007	40° 40' 39.60" N	80° 19'38.03" W
• TP# 73-163-0203.002	40° 40' 44.30" N	80° 19'23.26" W

The Property has been known by the following name(s): Shell Polymers Monaca Site, Shell Cracker Project, Shell Pennsylvania Chemicals, Former Horsehead Corporation Smelter Site. The DEP Land Recycling Program ID# is: 5-4-947-19345

A map of the Property is attached to this Environmental Covenant as Exhibit A. The complete description of the Property is attached to this Environmental Covenant as Exhibit B.

2. **Property Owner / GRANTOR / GRANTEE**. Shell Chemical Appalachia LLC is the owner of the Property and the GRANTOR and GRANTEE of this Environmental Covenant.

3. The mailing address of the owner is:

300 Frankfort Rd.
Monaca, PA 15061.

4. **Description of Contamination & Remedy**. The results of soil sampling indicated that soils on the property contain residual concentrations of metals exceeding PADEP non-residential direct contact Medium Specific Concentrations (MSCs). The locations for these soils shown in red on the attached Figure 4-1 in Exhibit C. Lead and arsenic were the most prevalent substances exceeding direct contact MSCs. Cadmium, mercury, zinc, and antimony also exceeded direct contact MSCs, although within a significantly smaller aerial extent. Several areas on the properties also exceeded the site-specific soil to groundwater standards calculated for the Site for cadmium, mercury, silver and zinc. Groundwater on the property contains concentrations of inorganic substances exceeding PADEP non-residential Medium Specific Concentrations. Cadmium, manganese, selenium, and zinc exceeded non-residential MSCs in at least one monitoring well, but were well below site-specific standards derived based on future use limitations and groundwater to surface water discharge modeling. The basis for the Act 2 attainment demonstration is the elimination of direct contact exposures to contaminants in soil and groundwater by:

- Capping/covering of soils exceeding non-residential direct contact MSCs (with buildings, foundations, concrete, pavement, aggregate, geosynthetics and soil cover depending on location);
- Establishing institutional controls (deed notices/restrictions) on the Site to limit future use to non-residential activities and preclude future potable use of untreated groundwater under the Uniform Environmental Covenants Act (UECA). Note that nonresidential property" also excludes use of the properties as schools, nursing homes or other residential-style facilities or recreational areas; and
- Establishing a soils management plan to describe the procedures and precautions to be undertaken if areas with soils exceeding direct contact standards are to be disturbed in the future.

Approximately 950,000 cubic yards of slag and soil were relocated to consolidation areas within the Brick Landfill area and the Eastern Consolidation Area, which were capped with a geosynthetic membrane covered by clean soil fill material and a two-foot soil cover, respectively. A cover consisting of gravel for a future railyard was also installed over portions of the site to mitigate direct contact exposure and potential exposure pathways to ecological receptors (including storm water runoff). Slag and soil exceeding direct contact MSCs that was not consolidated in and capped at the Brick Landfill or covered at the Fly Ash Landfill was covered with 7.2 million cubic yards of soil and rock generated by the site development work, building foundations, gravel, or asphalt/concrete paving. The exposed slag on the terrace of the riverbank was covered with Southern Parcel fill material and re-vegetated to mitigate direct contact exposure. Culverts were installed for streams to eliminate potential runoff from impacted materials to the water bodies. The Center Township Water Authority re-located their water supply wells from a location previously on-Site to a position upgradient of the Site. Groundwater attainment data collected following the soil remediation showed that concentrations of inorganics in groundwater remain far below the site-specific standards established for the Site. An Act 2 Final Report was submitted to the DEP on November 17, 2023, and was approved by PADEP on 21 June 2024.

5. **Activity & Use Limitations**. The Properties are subject to the following activity and use limitations, which the then current owner of the Properties, and its tenants, agents, employees and other persons under its control, shall abide by:

a. Residential Use Restriction: The Property shall not be used for residential purposes and may be used only for the purposes included in the meaning of the term "nonresidential property" as such term is defined in Section 103 of Act 2 (35 P.S. §6026.103)..

b. Inspection and maintenance of the remedial engineered features including soil and geosynthetic covers over consolidated impacted soils and culverts to convey surface water features shall be completed in accordance with the general guidelines as stated in the Site Post Remedial Care Plan included as Appendix V to the Act 2 Final Report and attached hereto as Exhibit D.

c. Material Handling Restrictions: All earth disturbance of impacted soils shall be managed in accordance with the August 2023 Soil Management Plan attached to the Act 2 Final Report approved in June 2024 (Exhibit E) and the Department's then current Management of Fill Policy.

.

d. Groundwater Use Restriction: The installation and use of water supply wells of any kind on the Property is prohibited (including, without limitation: water wells used for drinking, bathing or other human consumption or purposes and water wells used for livestock, farming or irrigation).

The installation of compliance wells, groundwater monitoring wells, recovery or extraction wells or similar devices for purposes of any remediation or any other corrective action work is permitted on the Property provided such wells comply with local, state and/or federal law and regulations and are approved by the Department.

6. **Notice of Limitations in Future Conveyances**. Each instrument hereafter conveying any interest in the Property subject to this Environmental Covenant shall contain a notice of the activity and use limitations set forth in this Environmental Covenant and shall provide the recorded location of this Environmental Covenant.

7. **Compliance Reporting**. On an annual basis, the then current owner of the Property shall submit, to the Department, written documentation stating whether or not the activity and use limitations in this Environmental Covenant are being abided by. In addition, within 1 month after any of the following events, the then current owner of the Property shall submit, to the Department and any Holder listed in Paragraph 2, written documentation: noncompliance with the activity and use limitations in this Environmental Covenant; transfer of the Properties; changes in use of the Properties; or filing of applications for building permits for the Properties and any proposals for any site work, if the building or proposed site work will affect the contamination on the Properties subject to this Environmental Covenant.

8. **Access by the Department**. In addition to any rights already possessed by the Department, this Environmental Covenant grants to the Department a right of reasonable access of the Property in connection with implementation or enforcement of this Environmental Covenant.

9. **Recording & Proof of Notification**. Within 30 days after the date of the Department's approval of this Environmental Covenant, the Owner shall file this Environmental Covenant with the Recorder of Deeds for Beaver County, and send a file-stamped copy of this Environmental Covenant to the Department within 60 days of recording. Within that time period, the Owner also shall send a file-stamped copy to each of the following: Townships of Potter and Center, and County of Beaver.

10. **Termination or Modification**.

(a) This Environmental Covenant may only be terminated or modified in accordance with 27 Pa. C.S. §§ 6509 or 6510, or in accordance with this paragraph.

(b) This Environmental Covenant may be amended or terminated as to any portion of the Properties that are acquired for use as state highway right-of-way by the Commonwealth provided that: (1) the Department waives the requirements for an environmental covenant and for conversion pursuant to 27 Pa. C.S. §6517 to the same extent that this Environmental Covenant is amended or terminated; (2) the Department determines that termination or modification of this Environmental Covenant will not adversely affect human health or the environment; and (3) the Department provides 30-days advance written notice to the current property owner, each holder, and, as practicable, each person that originally signed the Environmental Covenant or successors in interest to such persons.

11. **Department's address**. Communications with the Department regarding this Environmental Covenant shall be sent to:

Environmental Program Manager
Pennsylvania Department of Environmental Protection
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222

12. **Severability**. The paragraphs of this Environmental Covenant shall be severable and should any part hereof be declared invalid or unenforceable, the remainder shall continue in full force and effect between the parties.

ACKNOWLEDGMENTS by Owner(s) and any Holder(s), in the following form:

Shell Chemical Appalachia LLC, Grantor

Date: By: _____
Name: William Watson
Title: Operations Manager

APPROVED, by Commonwealth of Pennsylvania,
Department of Environmental Protection

Date: By: _____
Name: Diane D. McDaniel
Title: Program Manager

COMMONWEALTH OF PENNSYLVANIA)
)
COUNTY OF BEAVER) SS:

On this 30th day of August, 2024, before me, the undersigned officer, personally appeared [illegible] [Owner, Grantor] who acknowledged himself/herself to be the person whose name is subscribed to this Environmental Covenant, and acknowledged that s/he executed same for the purposes therein contained.

Operations manager of Shell Chemical Appalachia LLC

In witness whereof, I hereunto set my hand and official seal.

Commonwealth of Pennsylvania - Notary Seal
TERRI PIZOR-LEVENTHAL - Notary Public
Beaver County
My Commission Expires February 16, 2027
Commission Number 1095096

Notary Public

KJE

COMMONWEALTH OF PENNSYLVANIA)
)
COUNTY OF Allegheny) SS:

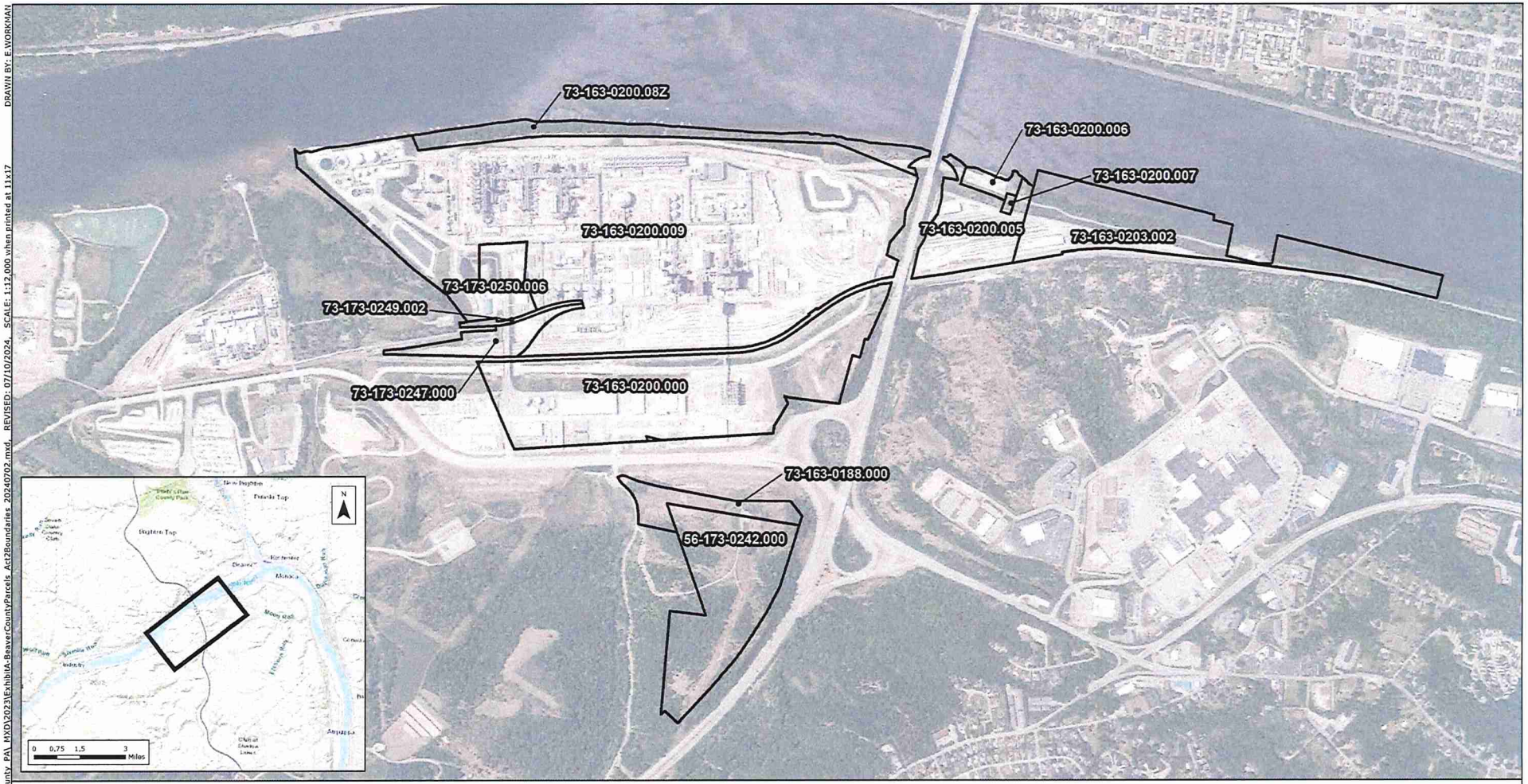
On this 28 day of August, 2024 before me, the undersigned officer, personally appeared Diane D. McPond who acknowledged himself/herself to be the Program Manager of the Commonwealth of Pennsylvania, Department of Environmental Protection, Program Manager Southwest Regional Officewhose name is subscribed to this Environmental Covenant, and acknowledged that s/he executed same for the purposes therein contained.

In witness whereof, I hereunto set my hand and official seal.

Notary Public

Commonwealth of Pennsylvania - Notary Seal
Blaire Patrick, Notary Public
Allegheny County
My commission expires September 15, 2027
Commission number 1438531

Exhibit A



Legend

Parcels - PA - Beaver County

Notes:
1. Beaver County GIS

N

0 1,000 2,000
Feet

Exhibit A
Act 2 Property Locations
Former Horsehead Corporation Site
Monaca, Pennsylvania

ERM

Source: Esri - World Topoographic Map; NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Z:\US\Projects\S-U\Shell\Franklin\BeaverCounty_PA_MXD\2023\ExhibitA-BeaverCountyParcels_Act2Boundaries_20240702.mxd REVISED: 07/10/2024 SCALE: 1:12,000 when printed at 11x17 DRAWN BY: E.WORKMAN

Exhibit B

73-163-0200.08Z

LEGAL DESCRIPTION
42.837 ACRES

ALL THAT CERTAIN piece or parcel of ground situate in the Township of Potter, County of Beaver, and the Commonwealth of Pennsylvania, being tax parcel number 73-163-0200.08Z, being Lot #3 in Shell Chemical Appalachia Lot Consolidation Plan No. 2 as recorded in Plan Book Volume 38, page 4, further based on a field survey prepared by Keystone Surveying and Mapping dated April 06, 2016 and being more particularly described as follows:

COMMENCING at an iron pin found located at the intersection of the western limited access right-of-way line of Interstate 376 and the northerly right-of-way line of State Route 18 AKA Frankfort Road; thence,

Along said western limited access right-of-way line of Interstate 376, the following seven (7) courses:

1. North 22°29'40" West, a distance of 500.11 feet to a point; thence,
2. North 67°29'05" East, a distance of 80.00 feet to a point; thence,
3. North 22°29'40" West, a distance of 200.00 feet to a point; thence,
4. North 67°29'05" East, a distance of 70.00 feet to a found iron pin; thence,
5. North 22°29'40" West, a distance of 393.90 feet to a point; thence,
6. North 43°42'20" East, a distance of 55.91 feet to a point; thence,
7. North 22°32'42" West, a distance of 1038.32 feet to an iron pin found at the northeastern most corner of Lot #2 and being the place of **BEGINNING**; thence,

Leaving said western limited access right-of-way line of Interstate 376, along the northerly line of said Lot # 2, the following eight (8) courses:

1. South 74°40'15" West, a distance of 956.30 feet to an iron pin found; thence,
2. South 59°58'49" West, a distance of 1663.60 feet to an iron pin found; thence,
3. South 53°11'17" West, a distance of 491.09 feet to an iron pin found; thence,
4. South 52°25'40" West, a distance of 889.73 feet to an iron pin found; thence,
5. South 45°20'26" West, a distance of 128.21 feet to an iron pin found; thence,
6. South 57°21'03" West, a distance of 11.29 feet to an iron pin found; thence,
7. South 45°30'25" West, a distance of 1178.64 feet to an iron pin found; thence,
8. North 59°38' 51" West, passing over a found iron pin at a distance of 71.12 feet, a total distance of 181.12 feet to a point on the United States Harbor Line of the Ohio River; thence,

Leaving said northerly line of Lot #2, along said United States Harbor Line of the Ohio River, the following eight (8) courses:

1. North 44°35'47" East, a distance of 1181.94 feet to a concrete monument with 1/2" iron pin set; thence,
2. North 57°21'03" West, a distance of 123.36 feet to a point; thence,
3. North 54°38'37" East, a distance of 2051.83 feet to a point; thence,
4. North 41°51'23" West, a distance of 140.00 feet to a point; thence,
5. North 53°08'37" East, a distance of 1700.00 feet to a point; thence,
6. South 24°06'23" West, a distance of 224.00 feet to a point; thence,
7. North 63°08'37" East, a distance of 565.95 feet to a point; thence,
8. North 64°53'00" East, a distance of 97.48 feet to a point on said eastern limited access right-of-way line of Interstate 376; thence,

Leaving said United States Harbor Line of the Ohio River, along said eastern limited access right-of-way line of Interstate 376, the following three (3) courses:

1. South 22°32'42" East, passing over an iron pin found at a distance of 179.98 feet, a total distance of 280.89 feet to an iron pin found; thence,
2. South 35°28'46" West, a distance 47.15 feet an iron pin found; thence,
3. South 22°32'42" East, a distance of 283.17 feet to the first mention point and place of **BEGINNING**.

Encompassing 42.837 acres of land, more or less, and subject to easements, right of ways, covenants and restriction of record. North and bearing system is based on Pennsylvania State Plane Coordinate System NAD83.

Iron pins set are 5/8" iron pins with a cap stamped "Keystone SU075168".

73-163-0200.009

LEGAL DESCRIPTION
231.322 ACRES

ALL THAT CERTAIN piece or parcel of ground situate in the Township of Potter, County of Beaver, and the Commonwealth of Pennsylvania, being Lot #2 of Shell Chemical Appalachia Subdivision / Lot Consolidation Plan No. 3, recorded in Plat Book Volume 38 page 109 in the Recorder of Deeds Office in Beaver County, PA, and being more particularly described as follows:

BEGINNING at an iron pin found on the westerly right-of-way line of State Route 376, being the southeasterly corner of land now or formerly conveyed to Shell Chemical Appalachia, LLC, being lot #3 of Shell Chemical Appalachia Consolidation Plan No. 2, recorded in plat book volume 38 page 4 in the recorder of Deeds Office in Beaver County, PA; thence,

Along the westerly line of State Route 376 and said Lot #2 of Shell Chemical Appalachia's tract, South 22°32'42" East, passing over an iron pin found at a distance of 967.65 feet, a total distance of 977.54 feet to a point; thence,

Along the line of land now or formerly conveyed to Three Rivers Railway, being Lot #5 as shown on "Shell Chemical Appalachia Subdivision / Lot Consolidation Plan No. 3", the following eight (8) courses:

1. Along a non-tangent curve deflecting to the left, having a radius of 1,510.91 feet, an arc length of 640.37 feet, subtended by a chord South 29°28'59" West, a chord distance of 635.58 feet to a point; thence,
2. South 17°20'28" West, a distance of 139.37 feet to a point; thence,
3. North 72°39'32" West, a distance of 15.00 feet to a point; thence,
4. South 17°20'28" West, a distance of 100.00 feet to a point; thence,
5. South 72°39'32" East, a distance of 15.00 feet to a point; thence,
6. South 17°20'28" West, a distance of 234.87 feet to a point; thence,
7. Along a curve deflecting to the right, having a radius of 1,096.28 feet, an arc length of 629.65 feet, subtended by a chord South 33°47'42" West, a distance of 621.03 feet to a point; thence,
8. South 50°14'56" West, a distance of 2,346.72 feet to a point; thence,

Leaving said Three Rivers Railway tract, along the easterly line of Lot #3 of said Shell Chemical Appalachia Subdivision / Lot Consolidation Plan No. 3, the following three (3) courses:

1. Along a non-tangent curve deflecting to the left, having a radius of 429.00 feet, an arc length of 275.76 feet, subtended by chord North 13°54'38" East, a distance of 271.04 feet to a point; thence,
2. North 02°10'21" West, a distance of 110.35 feet to a point; thence,
3. Along a curve deflecting to the right, having a radius of 639.28 feet, an arc length of 576.18 feet, subtended by a chord North 23°38'47" East, a distance of 556.88 feet to a point; thence,

Continuing along said Lot #3 and along the northerly line of Lot One of Brickyard Subdivision, recorded in Plat Book Volume 33 Page 227, North 57°21'03" West, a distance of 124.04 feet to a point; thence,

Continuing along the line of said Lot One, the following nine (9) courses:

1. Along a curve deflecting to the left, having a radius of 1,226.28, an arc length of 420.33 feet, subtended by a chord South 38°37'31" West, a distance of 418.28 feet to a point; thence,
2. South 28°31'20" West, a distance of 42.22 to a point; thence,
3. North 61°23'26" West, a distance of 378.85 feet to a point; thence,

4. North 38°19'34" West, a distance of 314.47 feet to a point; thence,
5. South 47°57'22" West, a distance of 531.47 feet to a point; thence,
6. South 38°14'52" East, a distance of 8.68 feet to a point; thence,
7. South 37°42'00" East, a distance of 374.37 feet to a point; thence,
8. South 47°16'32" West, a distance of 222.74 feet to a point; thence,
9. South 27°14'36" West, a distance of 106.21 feet to a found 1 1/2" iron pin on the easterly line of a tract now or formerly conveyed to Beaver County Corporation for Economic Development, by deed, recorded in Deed Book Volume 3562 Page 470; thence,

Continuing along said Beaver County Corporation for Economic Development tract the following five (5) courses:

1. South 87°25'33" West, a distance of 369.78 feet to a concrete monument with 1/2" iron pin set; thence,
2. North 84°06'16" West, a distance of 303.16 feet to an axle found; thence,
3. North 85°58'43" West, a distance of 774.81 feet to a found iron pin; thence,
4. North 88°44'17" West, a distance of 525.95 feet to a Mag nail in fence footer set; thence,
5. North 46°18'07" West, a distance of 198.56 feet to a concrete monument with 1/2" iron pin set on the southern line of the Ohio River; thence,

Along the south line of the Ohio River the following six (6) courses:

1. North 43°42'03" East, a distance of 506.72 feet to a point; thence,
2. South 46°17'57" East, a distance of 23.00 feet to a point; thence,
3. North 49°24'41" East, a distance of 100.50 to a point; thence,
4. South 46°17'57" East, a distance of 6.00 to a point; thence,
5. North 35°36'03" East, a distance of 323.00 feet to a point; thence,
6. North 44°37'22" East, a distance of 240.07 feet to a point; thence,

Leaving said Ohio River, along the westerly line of Lot #3 of Shell Chemical Appalachia Consolidation Plan No. 2, recorded in plat book volume 38 page 4, South 59°38'51" East, a distance of 181.12 feet to a found iron pin in the southern line of Lot #3, thence,

Continuing along the southerly line of Lot #3 of Shell Chemical Appalachia Consolidation Plan No. 2, recorded in plat book volume 38 page 4, the following seven (7) courses:

1. North 45°30'25" East, a distance of 1,178.64 feet to a found iron pin; thence,
2. North 57°21'03" West, a distance of 11.29 feet to a found iron pin; thence,
3. North 45°20'26" East, a distance of 128.21 feet to a found iron pin; thence,
4. North 52°25'40" East, a distance of 889.73 feet to a found iron pin; thence,
5. North 53°11'17" East, a distance of 491.09 feet to a found iron pin; thence,
6. North 59°58'49" East, a distance of 1,663.60 feet to a found iron pin; thence,
7. North 74°40'15" East, a distance of 956.30 feet to a found iron pin, being the point of **BEGINNING.**

Encompassing 231.322 acres of land, more or less, and subject to easements, right of ways, covenants and restrictions of record. North and bearing system is based on Pennsylvania State Plane Coordinate System NAD83.

73-173-0250.006

LEGAL DESCRIPTION
13.67 ACRES

ALL THAT CERTAIN piece or parcel of ground situate in the Township of Potter, County of Beaver, and the Commonwealth of Pennsylvania, designated as Part of Lot 1 of the Mall Subdivision as recorded in Plan Book 33 Page 227, in the Recorder of Deeds Office in Beaver County, further based on a field survey prepared by Keystone Surveying and Mapping dated December 5, 2014 and being more particularly described as follows:

BEGINNING at a set iron pin located at the southeasterly most corner of Lot #1 of the said Brickyard Subdivision, at the southwesterly most corner of a tract of land now or formerly conveyed to Horsehead Industries Inc., recorded in Instrument Number 3244688 and on the northerly right of way line of the Pittsburgh Lake Erie Railroad;

Thence along said Northerly right of way line of Lake Erie Railroad on the following five (5) courses:

1. On a curve deflecting to the left, having a radius of 1171.28 feet, an arc length of 416.80 feet and subtended by a chord South 39°00'48" West, a chord distance of 414.60 feet to an iron pin set;
2. South 28°31'20" West, a distance of 246.36 feet to an iron pin set;
3. On a curve deflecting to the right, having a radius of 933.43 feet, an arc length of 354.23 feet and subtended by a chord South 39°23'38" West, a chord distance of 352.11 feet to an iron pin set;
4. South 50°15'56" West, a distance of 290.60 feet to a found concrete monument;
5. North 57°32'44" West, a distance of 46.42 feet to a found concrete monument on the southerly line of a tract of land now or formerly conveyed to Le Petomane XXIII, Inc. by deed, recorded in Deed Book 3365 Page 181;

Thence leaving said northerly right of way line along the lines of said Le Petomane's tract on the following two (2) courses:

1. North 43°03'23" East, a distance of 69.11 feet to a found iron pin;
2. North 74°50'19" West, a distance of 427.02 feet to a found iron pin at the southwesterly most corner of Parcel "A" of the Plan of Subdivision recorded in Plan Book 31 Page 247;

Thence leaving said lines of the Le Petomane's tract, along the lines of said Parcel "A" on the following four (4) courses:

1. North 27°14'36" East, a distance of 106.21 feet to an iron pin found;
2. North 47°16'32" East, a distance of 222.74 feet to an iron pin found;
3. North 37°42'00" West, a distance of 374.37 feet to an iron pin found;
4. North 38°14'52" West, a distance of 8.68 feet to an iron pin found at the southwesterly most corner of Lot #2 of said Brickyard Subdivision;

Thence leaving the lines of said Parcel "A" on the lines of said Lot #2 on the following five (5) courses:

1. North 47°57'22" East, a distance of 531.47 feet to an iron pin found;
2. South 38°19'34" East, a distance of 314.47 feet to an iron pin found;
3. South 61°23'26" East, a distance of 378.85 feet to an iron pin found;
4. North 28°31'20" East, a distance of 42.22 feet to a point, witness by a found iron pipe North 60°20'58" West, a distance of 0.38 feet;
5. On a curve deflecting to the right, having a radius of 1226.28 feet, an arc length of 420.33 feet and subtended by a chord North 38°37'31" East, a chord distance of 418.28 feet, to an iron pin set on the westerly line of said Horsehead Industries tract;

Thence leaving said line of Lot #2, along said westerly line, South 57°22'03" East, a distance of 57.27 feet to the first mention point and place of **BEGINNING**.

Encompassing 13.674 acres of land, more or less, and subject to easements, right of ways, covenants and restriction of record. North and bearing system is based on Pennsylvania State Plane Coordinate System NAD83.

Iron pins set are 5/8" iron pins with a cap stamped "Keystone SU075168".

73-173-0249.002

LEGAL DESCRIPTION
3.355 ACRES

ALL THAT CERTAIN piece or parcel of ground situate in the Township of Potter, County of Beaver, and the Commonwealth of Pennsylvania, being part of tax parcel #73-173-0249.002, being a tract of land now or formerly conveyed to Horsehead Corporation, by deed, recorded in Instrument #3244688 in the Recorder of Deeds Office in Beaver County, further based on a field survey prepared by Keystone Surveying and Mapping dated December, 2014 and being more particularly described as follows:

COMMENCING at a set iron pin located at a northerly right-of way line of State Route 18 AKA Frankfort Road and the westerly limited access right-of-way line for Interstate 376;

Thence along said northerly right-of-way line of State Route 18, the following seven (7) courses:

1. Along a non-tangent curve deflecting to the left, having a radius of 1281.28 feet, an arc length of 167.68 feet, subtended by a chord North 85°54'40" West, a chord distance of 167.56 feet to a set iron pin;
2. South 00°20'24" West, a distance of 35.00 feet to a set iron pin;
3. Along a non-tangent curve deflecting to the left, having a radius of 1246.28 feet, an arc length of 652.33 feet, and subtended by a chord South 75°20'42" West, a chord distance of 644.91 feet to a set iron pin;
4. South 29°39'00" East, a distance of 40.00 feet to a set iron pin;
5. South 56°17'48" West, a distance of 170.53 feet to a set iron pin;
6. South 52°14'37" West, a distance of 862.47 feet to a set mag nail in Old Frankfort Road running westerly to the southerly line of the Pittsburgh and Lake Erie Railroad;

Thence along said Old Frankfort Road, North 57°21'03" West, passing over a set mag nail at a distance of 120.48 feet, passing over a set mag nail at a distance of 416.04 feet, a total distance of 601.52 feet to a set mag nail at the northwesterly most corner of said Horsehead Corporation's tract, being tax parcel number 73-163-0200.001, and on the southerly line of another tract of said Horsehead Corporation, being tax parcel number 73-163-0190.000 and the point of **BEGINNING**;

Thence leaving said Old Frankfort Road, along the westerly line of said Horsehead Corporation's tract, being part of tax parcel number 73-163-0200.001, and on the center line of Township Road #528 AKA Old Frankfort Road, along a non-tangent curve deflecting to the left, having a radius of 639.27 feet, an arc length of 576.14 feet, subtended by a chord South 23°38'53" West, a chord distance of 556.84 feet to set mag nail on the westerly line of said Horsehead Corporation's tract, being part tax parcel number 73-163-0200.000;

Thence continuing along said Township Road #528 and said westerly line of Horsehead Corporation's tract, being part tax parcel number 73-163-0200.000, South 02°10'21" East, a distance of 110.38 feet to a set mag nail at the northeasterly most corner of a tract of land now or formerly conveyed to Shell Chemical Appalachia, by deed, recorded in Instrument #3495428;

Thence leaving said Township Road #528, and said westerly line of Horsehead Corporation's tract, being part tax parcel number 73-163-0200.000, along the lines of said Shell Chemical Appalachia's tract, on the following three (3) courses:

1. North 61°21'45" West, a distance of 44.03 feet to a set iron pin;

2. South 45°18'45" West, a distance of 413.04 feet to a set iron pin;
3. South 46°59'30" East, passing over a found mine bolt at a distance of 159.79, a total distance of 184.87 feet to a set mag nail in the center of said Township Road #528;

Thence along said centerline of Township Road #528, on the following three (3) courses:

1. Along a non-tangent curve deflecting to the right, having a radius of 429.00 feet, an arc length of 80.55 feet, subtended by a chord South 62°52'06" West, a distance of 80.43 feet to a set mag nail;
2. South 68°14'50" West, at a distance of 160.72 feet to a found mag nail at a northerly corner of a tract of land now or formerly conveyed to Shell Chemical Appalachia, by deed, recorded in Instrument #3494159;
3. Along said line of Shell Chemical Appalachia's tract, on a curve deflecting to the left, having a radius of 1040.21 feet, an arc length of 5.57 feet, subtended by a chord South 69°39'13" West, a chord distance of 5.57 feet to a set mag nail;

Thence leaving said centerline of Township Road #528, along the northerly line of said Shell Chemical Appalachia's tract, North 57°21'53" West, a distance of 111.25 feet to a set iron pin on the easterly line of the Pittsburgh and Lake Erie Railroad;

Thence leaving said northerly line of Shell Chemical Appalachia's tract, along the easterly lines of said Pittsburgh and Lake Erie Railroad, on the following five (5) courses:

1. North 57°24'33" West, a distance of 72.51 feet to a found concrete monument;
2. North 43°01'00" East, a distance of 343.36 feet to a set iron pin;
3. Along a curve deflecting to the left, having a radius of 1171.28 feet, an arc length of 293.78 feet, subtended by a chord North 35°49'52" East, a chord distance of 293.01 feet, to a set iron pin;
4. North 28°38'45" East, a distance of 246.27 feet to a set iron pin;
5. Along a curve deflecting to the right, having a radius of 1121.78, an arc length of 413.72 feet, subtended by a chord North 39°12'57" East, a chord distance of 411.37 feet to a set mag nail on said Old Frankfort Road;

Thence leaving said easterly line of Pittsburgh and Lake Erie Railroad, along Old Frankfort Road, South 57°21'03" East, passing over a set mag nail at a distance of 5.72 feet, a total distance of 15.69 feet the first mentioned point and the point of **BEGINNING**.

Encompassing 3.355 acres of land, more or less, and subject to easements, right of ways, covenants and restrictions of record. North and bearing system is based on Pennsylvania State Plane Coordinate System NAD83.

Iron pins set are 5/8" iron pins with a cap stamped "Keystone SU075168".

73-173-0247.000

LEGAL DESCRIPTION
8.300 ACRES

ALL THAT CERTAIN piece or parcel of ground situate in the Township of Potter, County of Beaver, and the Commonwealth of Pennsylvania, being Lot #3 as shown on "Shell Chemical Appalachia Subdivision / Lot Consolidation Plan No. 3", prepared by Keystone Surveying and Mapping dated July 21, 2017, and being more particularly described as follows:

COMMENCING at an iron pin found on the westerly right-of-way line of State Route 376, being the southeasterly corner of land now or formerly conveyed to Shell Chemical Appalachia, LLC, being lot #1 of Shell Chemical Appalachia Consolidation Plan No. 2, recorded in plat book volume 38 page 4 in the recorder of Deeds Office in Beaver County, PA; thence,

Along the southerly line of said Lot #1 of Shell Chemical Appalachia's tract, South 46°39'35" West, a distance of 663.34 feet to a found iron pin on the northern line of "Old" SR 18 and the northern line of Frankfort Road; thence,

Along the northern line of Frankfort Road the following nine (9) courses:

1. Along a non-tangent curve deflecting to the left, having a radius of 1281.28 feet, an arc length of 167.68 feet, subtended by a chord North 85°54'40" West, a chord distance of 167.56 feet to a found iron pin; thence,
2. South 00°20'24" West, a distance of 35.00 feet to a found iron pin; thence,
3. Along a non-tangent curve deflecting to the left, having a radius of 1246.28 feet, an arc length of 652.33 feet, subtended by a chord South 75°20'42" West, a chord distance of 644.91 feet to a found iron pin; thence,
4. South 29°39'00" East, a distance of 40.00 feet to a found iron pin; thence,
5. South 56°17'48" West, a distance of 170.53 feet to a found iron pin; thence,
6. South 52°14'37" West, a distance of 862.47 feet to a found iron pin; thence,
7. South 52°15'50" West, a distance of 737.82 feet to a point; thence,
8. South 50°14'56" West, a distance of 251.16 feet to a point; thence,
9. North 39°45'04" West, a distance of 50.00 feet to a point, being the point of **BEGINNING.**

Thence along the line of land now or formerly conveyed to CSX, being Lot #5 as shown on "Shell Chemical Appalachia Subdivision / Lot Consolidation Plan No. 3", prepared by Keystone Surveying and Mapping dated July 21, 2017 following fourteen (14) courses:

1. Along a curve deflecting to the right, having a radius of 2814.94 feet, an arc length of 187.59 feet, subtended by a chord South 52°09'29" West, a chord distance of 187.56 to a point; thence,
2. South 54°04'02" West, a distance of 973.02 feet to a point; thence,
3. South 53°31'50" West, a distance of 131.05 feet to a point; thence,
4. North 41°27'55" West, a distance of 36.17 feet to a point; thence,
5. North 46°11'09" East, a distance of 83.59 feet to a point; thence,
6. North 48°41'35" East, a distance of 104.46 feet to a point; thence,
7. North 43°00'09" East, a distance of 633.90 feet to a point; thence,
8. North 46°59'51" West, a distance of 69.78 feet to a point; thence,
9. Along a non-tangent curve deflecting to the right, having a radius of 716.78 feet, an arc length of 56.50 feet, subtended by a chord North 46°28'10" East, a chord distance of 56.48 feet to a point; thence,

10. North 48°43'39" East, a distance of 120.91 feet to a point; thence,
11. Along a curve deflecting to the right, having a radius of 1225.57 feet, an arc length of 31.29 feet, subtended by a chord North 49°26'29" East, a chord distance of 31.29 feet to a point; thence,
12. North 50°09'19" East, a distance of 58.92 feet to a point; thence,
13. Along a curve deflecting to the left, having a radius of 1818.00 feet, an arc length of 97.71 feet, subtended by a chord North 48°36'56" East, a distance of 97.70 feet to a point; thence,
14. North 46°59'22" West, a distance of 43.00 feet to a point in land now or formerly conveyed to Shell Chemical Appalachia, LLC, being Lot #1 of Shell Chemical Appalachia Consolidation Plan No. 2 recorded in plat book volume 38 page 4 in the recorder of Deeds Office in Beaver County, PA; thence,

Along the line of said Lot #1 the following three (3) courses;

1. Along a non-tangent curve deflecting to the left, having a radius of 933.43 feet, an arc length of 281.99 feet subtended by a chord North 37°10'36" East, a chord distance of 280.92 feet to a point; thence,
2. North 28°31'20" East, a distance of 246.36 feet to a point; thence,
3. Along a curve deflecting to the right, having a radius of 1171.28 feet, an arc length of 416.80 feet, subtended by a chord North 39°00'48" East, a chord distance of 414.60 feet to a point in land now or formerly conveyed to Shell Chemical Appalachia, LLC, being part of Lot #2 of Shell Chemical Appalachia Consolidation Plan No. 2 recorded in plat book volume 38 page 4 in the recorder of Deeds Office in Beaver County, PA; thence,

Along the line of said Lot #2 the following five (5) courses;

1. South 57°21'03" East, a distance of 66.77 feet to a point; thence,
2. Along a curve deflecting to the left, having a radius of 639.28 feet, an arc length of 576.18 feet, subtended by a chord South 23°38'47" West, a chord distance of 556.88 feet to a point; thence,
3. South 02°10'21" East, a distance of 110.35 feet to a point; thence,
4. Along a curve deflecting to the right, having a radius of 429.00 feet, an arc length of 275.76 feet, subtended by a chord South 13°54'38" West, a chord distance of 271.04 feet to a point; thence,
5. South 50°14'56" West, a distance of 23.09 feet to the first mentioned point and place of **BEGINNING.**

Encompassing 8.300 acres of land, more or less, and subject to easements, right of ways, covenants and restrictions of record. North and bearing system is based on Pennsylvania State Plane Coordinate System NAD83.

73-163-0200.000

LEGAL DESCRIPTION
78.154 ACRES

ALL THAT CERTAIN piece or parcel of ground situate in the Township of Potter, County of Beaver, and the Commonwealth of Pennsylvania, being Lot #1 of Shell Chemical Appalachia Subdivision/Lot Consolidation Plan No. 3, recorded in Plat Book Volume 38 page 109 in the Recorder of Deeds Office in Beaver County, PA, and being more particularly described as follows:

COMMENCING at an iron pin found on the westerly right-of-way line of State Route 376, being the southeasterly corner of land now or formerly conveyed to Shell Chemical Appalachia, LLC, being lot #3 of Shell Chemical Appalachia Consolidation Plan No. 2, recorded in Plat Book Volume 38 page 4 in the recorder of Deeds Office in Beaver County, PA; thence,

Along the westerly line of State Route 376 and said Lot #2 of Shell Chemical Appalachia's tract, the following three (3) courses:

1. South 22°32'42" East, passing over an iron pin found at a distance of 967.65 feet, a total distance of 977.54 feet to a point,
2. South 22°32'42" East, a distance of 60.77 feet to a point; thence,
3. South 43°42'20" West, a distance of 55.91 feet to a concrete monument with 1/2" iron pin set; thence,
4. South 22°29'40" East, a distance of 7.72 feet to a concrete monument with 1/2" iron pin set, also being the point of **BEGINNING**; thence,

Along the westerly and northerly right-of-way lines of State Route 376, variable width, the following nine (9) courses:

10. South 22°29'40" East, passing over a found iron pin at a distance of 67.09 feet, a total distance of 386.17 feet to a found iron pin; thence,
11. South 67°29'05" West, a distance of 70.00 feet to a found iron pin; thence,
12. South 22°29'40" East, a distance of 200.00 feet to a found iron pin; thence,
13. South 67°29'05" West, a distance of 80.00 feet to a found iron pin; thence,
14. South 22°29'40" East, a distance of 500.11 feet to a found iron pin; thence,
15. South 46°39'35" West, a distance of 509.17 feet to a concrete monument with 1/2" iron pin set; thence,
16. South 51°54'51" East, a distance of 81.93 feet to a 5/8" iron pin drilled in rock formation set; thence,
17. South 01°03'44" East, a distance of 477.84 feet to a 5/8" capped iron pin stamped "Jacobs" found; thence,
18. South 06°33'16" West, a distance of 128.64 feet to a 5/8" iron pin found on the northerly right-of-way lines of Frankfort Road (SR-0018), variable width; thence,

Along the northerly right-of-way lines of said Frankfort Road, South 47°17'34" West, a distance of 198.73 feet to a concrete monument with 1/2" iron pin set; thence,

Continuing along the northerly right-of-way lines of said Frankfort Road, South 51°01'49" West, a distance of 653.17 feet to a point on the east corner of other land conveyed to Shell Chemical Appalachia, LLC, by deed, recorded in Deed Book Volume 3508 Page P57; thence,

Leaving said Frankfort Road and along the northerly and westerly line of other land of said Shell Chemical Appalachia, LLC the following three (3) courses:

1. South 60°27'53" West, a distance of 426.81 feet to a point; thence,
2. South 56°47'59" East, a distance of 60.85 feet to a point; thence,
3. South 20°03'39" West, a distance of 103.06 feet to a point on the northerly right-of-way lines of said Frankfort Road; thence,

Along the northerly right-of-way lines of said Frankfort Road the following seven (7) courses:

1. South 51°01'49" West, a distance of 96.06 feet to a concrete monument with 1/2" iron pin set; thence,
2. North 38°58'11" West, a distance of 41.00 feet to a concrete monument with 1/2" iron pin set; thence,
3. South 51°01'49" West, a distance of 120.00 feet to a concrete monument with 1/2" iron pin set; thence,
4. South 38°58'11" East, a distance of 41.00 feet to a concrete monument with 1/2" iron pin set; thence,
5. South 51°01'49" West, a distance of 990.00 feet to a 5/8" capped iron pin stamped "Jacobs" found; thence,
6. North 38°58'11" West, a distance of 11.00 feet to a 5/8" capped iron pin stamped "Jacobs" found; thence,
7. South 51°01'49" West, a distance of 59.71 feet to a point; thence,

Leaving said right of way lines along a tract of land now or formerly conveyed to Shell Chemical Appalachia, by deed, recorded in Deed Book Volume 3461 Page 710, being Lot #4 of said Shell Chemical Appalachia Subdivision/Lot Consolidation Plan No. 3, North 56°53'52" West, a distance of 999.73 feet to a point; thence,

Along the southern line of land now or formerly conveyed to Three Rivers Railway, being Lot #5 of said Shell Chemical Appalachia Subdivision/Lot Consolidation Plan No. 3 the following seven (7) courses:

1. North 54°04'02" East, a distance of 178.80 feet to a point; thence,
2. Along a non-tangent curve deflecting to the left, having a radius of 2864.93 feet, an arc length of 190.92 feet, subtended by a chord North 52°09'29" East, a distance of 190.89 feet to a point; thence,
3. North 50°14'56" East, a distance of 2369.82 feet to a point; thence,
4. Along a non-tangent curve deflecting to the left, having a radius of 1146.28 feet, an arc length of 658.36 feet, subtended by a chord North 33°47'42" East, a distance of 649.35 feet to a point; thence,
5. North 17°20'28" East, a distance of 474.24 feet to a point; thence,
6. Along a non-tangent curve deflecting to the right, having a radius of 1360.33 feet, an arc length of 532.18 feet, subtended by a chord North 28°32'55" East, a distance of 528.79 feet to the first mentioned point and place of **BEGINNING.**

Encompassing 78.154 acres of land, more or less, and subject to easements, right of ways, covenants and restrictions of record. North and bearing system is based on Pennsylvania State Plane Coordinate System NAD83.

73-163-0188.000

LEGAL DESCRIPTION
32.001 ACRES

ALL THAT CERTAIN piece or parcel of ground situate in the Township of Potter, County of Beaver, and the Commonwealth of Pennsylvania, being tax parcel #73-163-0188.000, being a tract of land now or formerly conveyed to Horsehead Corporation, by deed, recorded in Instrument #3244688 in the Recorder of Deeds Office in Beaver County, further based on a field survey prepared by Keystone Surveying and Mapping dated December, 2014 and being more particularly described as follows:

BEGINNING at a set mag nail in the center of State Route 3017, AKA Pleasant Drive on the southerly line of said Horsehead Corporation's tract, being part of tax parcel number 73-163-0200.000, at the northern most corner of a tract of land now or formerly conveyed to Shell Chemical L.P., by deed, recorded in Instrument #3495410;

Thence along the lines of said Horsehead Corporation's tract, being part of tax parcel number 73-163-0200.000 the following three (3) courses:

1. North 20°03'39" East, a distance of 301.23 feet to a found concrete monument;
2. North 56°47'59" West, a distance of 60.85 feet to a found concrete monument;
3. North 60°27'53" East, a distance of 1538.34 feet to a set iron pin, on the southerly limited access right-of-way line of Intestate 376;

Thence leaving the lines of said Horsehead Corporation's tract, along southerly limited access right-of-way line of Intestate 376, the following four (4) courses:

1. South 75°33'31" East, a distance of 607.57 feet to a set iron pin;
2. South 22°32'42" East, a distance of 148.65 feet to a set iron pin;
3. North 72°51'17" East, a distance of 36.77 feet to a set iron pin;
4. Along a non-tangent curve deflecting to the right, having a radius of 5579.58, an arc length of 123.08 feet, and subtended by a chord South 16°30'48" East, a chord distance of 123.07 feet to a set iron pin;

Thence leaving said limited access right-of-way line of Intestate 376, along the lines of said Horsehead Corporation's tract, being tax parcel number 56-173-0242.000, the following two (2) courses:

1. South 60°32'47" West, a distance of 1608.55 feet to a set iron pin and cap;
2. South 56°43'38" East, a distance of 265.29 feet to a found iron pin at the northern most corner of a tract of land now or formerly conveyed to Shell Chemical LP, by deed, recorded in Instrument #3500008;

Thence leaving the lines of said Horsehead Corporation's tract, along the northerly line of said Shell Chemical LP's tract, South 69°45'43" West, passing a found iron pin at a distance of 334.14 feet, for a total distance of 366.80 feet to a set railroad spike with a punch, in the center of State Route 3017 AKA Pleasant Drive;

Thence leaving said northerly line of Shell Chemical LP's tract, along the said center of said State Route 3017, on the following six (6) courses:

1. North 35°44'44" West, a distance of 51.54 feet to a set mag nail;
2. North 45°15'39" West, a distance of 99.87 feet to a set mag nail;
3. North 45°16'21" West, a distance of 75.00 feet to a set mag nail;

4. North 45°16'21" West, a distance of 66.08 feet to a set mag nail;
5. North 78°46'21" West, a distance of 264.00 feet to a set mag nail;
6. North 45°16'21" West, a distance of 173.25 feet to a set mag nail, to the first mention point and place of **BEGINNING**.

Encompassing 32.001 acres of land, more or less, and subject to easements, right of ways, covenants and restrictions of record. North and bearing system is based on Pennsylvania State Plane Coordinate System NAD83.

Iron pins set are 5/8" iron pins with a cap stamped "Keystone SU075168".

56-173-0242.000

LEGAL DESCRIPTION
43.205 ACRES

ALL THAT CERTAIN piece or parcel of ground situate in the Townships of Potter and Center, County of Beaver, and the Commonwealth of Pennsylvania, being tax parcel #56-173-0242.000, being a tract of land now or formerly conveyed to Horsehead Corporation, by deed, recorded in Instrument #3244688 in the Recorder of Deeds Office in Beaver County, further based on a field survey prepared by Keystone Surveying and Mapping dated December, 2014 and being more particularly described as follows:

COMMENCING at a set mag nail in the center of State Route 3017, AKA Pleasant Drive on the southerly line of said Horsehead Corporation's tract, being tax parcel number 73-163-0200.000, at the northern most corner of a tract of land now or formerly conveyed to Shell Chemical L.P., by deed, recorded in Instrument #3495410, and a westerly corner of said Horsehead Corporation's tract, being tax parcel number 73-163-0188.000;

Thence along the center line of said State Route 3017, the northeasterly lines of said Shell Chemical L.P. tract, the westerly lines of said Horsehead Corporation's tract, being tax parcel number, 73-163-0188.000, and on the lines of tracts of land now or formerly conveyed to Shell Chemical Appalachia, by deed, recorded in Instrument #3494481 and Instrument #3494482, on the following six (6) courses;

1. South 45°16'21" East, a distance of 173.25 feet to a set mag nail;
2. South 78°46'21" East, a distance of 264.00 feet to a set mag nail;
3. South 45°16'21" East, a distance of 66.08 feet to a set mag nail;
4. South 45°16'21" East, a distance of 75.00 feet to a set mag nail;
5. South 45°15'39" East, a distance of 99.87 feet to a set mag nail;
6. South 53°44'44" East, a distance of 51.54 feet to a set mag nail;

Thence leaving said centerline along the northerly line of a tract of land now or formerly conveyed to Shell Chemical LP tract, by deed, recorded in Instrument #3500008, North 69°45'43" East, and the southerly line of said Horsehead Corporation's tract, being tax parcel number 73-163-0188.000, passing over a found iron pin at a distance of 32.66 feet total distance of 366.80 feet to a found iron pin and further being the point of **BEGINNING**;

Thence leaving said northerly line of Shell Chemical LP's tract, along the lines of said Horsehead Corporation's tract, being tax parcel number 73-163-0188.000, the following two (2) courses:

1. North 56°43'38" West, a distance of 265.29 feet to a set iron pin;
2. North 60°32'47" East, a distance of 1608.55 feet to a set iron pin;

Thence leaving the lines of said Horsehead Corporation's tract, along southerly limited access right-of-way line of Intestate 376, the following five (5) courses:

1. On a curve deflecting to the right, having a radius of 5579.58, an arc length of 700.17 feet, and subtended by a chord South 12°17'11" East, a chord distance of 699.71 feet to a set iron pin;
2. South 81°18'31" West, a distance of 60.00 feet to a set iron pin;
3. On a curve deflecting to the right, having a radius of 5519.58, an arc length of 529.59 feet, and subtended by a chord South 05°56'34" East, a chord distance of 529.38 feet to a set iron pin;
4. On a curve deflecting to the right, having a radius of 5519.58, an arc length of 1300.78 feet, and subtended by a chord South 03°33'26" West, a chord distance of 1297.77 feet to a set iron pin;
5. North 79°41'30" West, a distance of 190.00 feet to a set iron pin;

Thence leaving said limited access right-of-way line of Intestate 376,along the lines of a tract of land now or formerly conveyed to Robert L JR. Squirels, by deed, recorded in Deed Book Volume 1510 Page 34, the following three (3) courses:

1. North 34°50'54" West, a distance of 1009.10 feet to a set iron pin;
2. North 62°30'43" East, a distance of 380.00 feet to a set iron pin;
3. North 56°29'17" West, a distance of 325.63 feet to a set iron pin at the eastern most corner of said Shell Chemical LP's tract recorded in Instrument #3500008;

Thence leaving said Robert L JR. Squirels' line, along the easterly line of said Shell Chemical LP's tract, North 56°29'17" West, a distance of 653.40 feet, to the first mention point and place of **BEGINNING**.

Encompassing a total of 43.205 acres of land, of which, 37.930 acres are located in Potter Township and 5.275 acres are located in Center Township, more or less, and subject to easements, right of ways, covenants and restriction of record. North and bearing system is based on Pennsylvania State Plane Coordinate System NAD83.

Iron pins set are 5/8" iron pins with a cap stamped "Keystone SU075168".

73-163-0200.005

LEGAL DESCRIPTION
21.617 ACRES

ALL THAT CERTAIN piece or parcel of ground situate in the Township of Potter, County of Beaver, and the Commonwealth of Pennsylvania, being part of tax parcel number 73-163-0200.005, further being part of Lot No. 1 of the Mall Subdivision as recorded in Plan Book Volume 33 Page 230, in the Recorder of Deeds Office in Beaver County, further based on a field survey prepared by Keystone Surveying and Mapping dated November 25, 2014 and being more particularly described as follows:

BEGINNING at a set iron pin located at a southwestern corner of said Lot #1 of the Mall Subdivision, on the easterly limited access right of way line of Interstate 376, and on the northerly line of the Pittsburgh and Lake Erie Railroad;

Thence along said westerly limited access right-of-way line of Interstate 376 and the easterly line of said Lot #1 on the following three (3) courses:

1. North 22°32'42" West, a distance of 1169.64 feet to a set iron pin;
2. North 85°58'19" West, a distance of 44.72 feet to a set iron pin;
3. North 22°32'42" West, a distance of 286.11 feet to a point on the northerly line of said Lot #1 and a point in the Ohio River;

Thence leaving said westerly limited access right-of-way line along the northerly line of said Lot #1, North 67°25'17" East, a distance of 284.23 feet to a point at the northwesterly corner of a tract of land now or formerly conveyed to Center Township Water Authority, by deed, recorded in Instrument Number 3401406 and a point in the Ohio River;

Thence leaving said northerly line of Lot #1, along said Center Township Water Authority's lines, on the following six (6) courses:

1. South 19°15'06" East, passing over a set iron pin at a distance of 230.00 feet, a total distance of 377.76 feet to an iron pin set;
2. North 72°22'20" East, a distance of 392.40 feet to a point, witnessed by a found concrete monument North 71°29'06" East , a distance of 6.58 feet;
3. North 77°56'23" East, a distance of 98.64 feet to a set iron pin;
4. South 19°25'59" East, a distance of 120.18 feet to a point;
5. North 70°34'01" East, a distance of 100.00 feet to a found concrete monument;
6. North 19°25'59" West passing over a found concrete monument at a distance of 200.00 feet, a total distance of 555.32 feet to a point on the northerly line of said Lot #1 and a point in the Ohio River;

Thence with said northerly line of Lot #1, North 67°25'17" East, a distance of 126.86 feet to the northwesterly corner of Lot #2 of said Mall Subdivision and a point in the Ohio River;

Thence leaving said northerly line of Lot #1, along the westerly line of Lot #2, South 19°36'05" East, passing over a set iron pin at a distance of 260.00 feet, a total distance of 1067.67 feet to an iron pin set on the northerly line of said Pittsburgh and Lake Erie Railroad, and the southwesterly most corner of said Lot #2;

Thence along said southerly line of Lot #1, and the northerly line of said Pittsburgh and Lake Erie Railroad, South 43°06'07" West, a distance of 994.47 feet to the first mentioned point and place of **BEGINNING.**

Encompassing 21.617 acres of land, more or less, and subject to easements, right of ways, covenants and restrictions of record. North and bearing system is based on Pennsylvania State Plane Coordinate System NAD83.

Iron pins set are 5/8" iron pins with a cap stamped "Keystone SU075168".

73-163-0200.006

LEGAL DESCRIPTION
5.30 ACRES

All that certain parcel of land situate in Township of Potter, County of Beaver and Commonwealth of Pennsylvania, being proposed Parcel "B" in the proposed Mall Subdivision No. 3 which is a subdivision of Lot 1 in the Mall Subdivision recorded in Plan Book Volume 33 page 230 in the Beaver County Recorder of Deeds Office, particularly bound and described as follows:

Commencing at the northeast corner of Lot 1 common with the northwest corner of Lot 2 in said Mall Subdivision recorded in Plan Book Volume 33 page 230; thence along the northerly line of said Lot 1 South 67°28'15" West, 127.13 feet to the TRUE POINT OF BEGINNING of proposed Parcel "B" hereinafter described; thence from the true point of beginning through said Lot 1 the following three courses: South 19°22'47" East, 355.31 feet; South 70°37'13" West, 100.00 feet; and South 19°22'47" East, 79.82 feet to the southeast corner of the proposed Parcel "B" herein described, said southeast corner being North 19°22'47" West, 745.53 feet from an existing concrete monument on the southerly line of said Lot 1 common with the northerly line of lands now or formerly of Pittsburgh and Lake Erie Railroad Company; thence continuing through said Lot 1 the following three courses: South 77°59'35" West, 98.64 feet; South 72°25'32" West, 392.40 feet; and North 19°11'54" West, 377.72 feet to a point on the northerly line of said Lot 1, said point being the northwest corner of proposed Parcel "B" herein described; thence along the northerly line of said Lot 1 North 67°28'15" East, 589.73 feet to the true point of beginning.

Having an area of 230,950 square feet or 5.30 acres

73-163-0200.007

LEGAL DESCRIPTION
0.459 ACRES

All that certain parcel of land situate in Township of Potter, County of Beaver and Commonwealth of Pennsylvania, being Proposed Parcel "A" in the proposed Mall Subdivision No. 3 which is a subdivision of Lot 1 in the Mall Subdivision recorded in Plan Book Volume 33 page 230 in the Beaver County Recorder of Deeds Office, particularly bound and described as follows:

Commencing at the northeast corner of Lot 1 common with the northwest corner of Lot 2 in said Mall Subdivision recorded in Plan Book Volume 33 page 230; thence along the northerly line of said Lot 1 South 67°28'15" West, 127.13 feet to the northeasterly corner of Proposed Parcel "B" in the aforesaid proposed Mall Subdivision No. 3; thence along the easterly line of said proposed Parcel "B" and through Lot 1 South 19°22'47" East, 355.31 feet to the TRUE POINT OF BEGINNING of Proposed Parcel "A" hereinafter described; thence from the true point of beginning and through said Lot 1 the following two courses: South 19°22'47" East, 200.00 feet to an existing concrete monument and South 70°37'13" West, 100.00 feet to the southwest corner of the proposed Parcel "A" herein described, said southwest corner being North 19°22'47" West, 625.35 feet from an existing concrete monument on the southerly line of said Lot 1 common with the northerly line of lands now or formerly of Pittsburgh and Lake Erie Railroad Company; thence continuing through said Lot 1 the following two courses: North 19°22'47" West, 200.00 feet and North 70°37'13" East, 100.00 feet to the true point of beginning.

Having an area of 20,000 square feet or 0.459 acre.

73-163-0203.002

LEGAL DESCRIPTION
46.80 ACRES

ALL THAT CERTAIN piece or parcel of ground situate in the Township of Potter, County of Beaver, and the Commonwealth of Pennsylvania, designated as Lot 1 of the CSX Transportation/Property-Shell Chemical Appalachia/Lot Consolidation Plan #1 as recorded in Plan Book 38 Page 248, in the Recorder of Deeds Office in Beaver County and being more particularly described as follows:

BEGINNING at a point located at the southeasterly most corner of Lot #1 of the Mall Subdivision as recorded in Plan Book 38 Page 248, on the westerly limited access right of way line of Interstate 376, and on the northerly right of way line of the Pittsburgh Lake Erie Railroad;

Thence along said northerly right of way line of the Pittsburgh and Lake Erie Railroad, and the southerly line of said Lot # 1, North 43°06'07" East, a distance of 994.47 feet an iron pin found that the southeasterly most corner of said Lot #1;

Thence leaving said northerly right of way line, along the easterly line of said Lot #1, North 19°36'05" West, a distance of 1,067.67 feet to point being the northeasterly most corner of said Lot #1;

Thence leaving said westerly line of Lot #1, North 67°25'17" East, a distance of 1,912.72 feet to a point;

Thence South 29°05'03" East, a distance of 45.23 feet to a point;

Thence North 65°48'04" East, a distance of 204.15 feet to a point on the northwesterly corner of land now or formerly conveyed to Center Township Water Authority, as recorded in Deed Book Volume 3528 Page 115;

Thence along the lines of said Center Township Water Authority tract the following four (4) courses:

1. Thence South 26°43'27" East, a distance of 331.45 feet to a point;
2. Thence North 66°06'11" East, a distance of 346.04 feet to a point;
3. Thence North 51°43'33" East, a distance of 137.15 feet to a point;
4. Thence North 26°43'27" West, a distance of 299.88 feet to a point;

Thence North 65°48'04" East, a distance of 940.39 feet to a point;

Thence North 67°42'41" East, a distance of 820.00 feet to a point at the northwesterly most corner of land now or formerly conveyed to Al Gaudino, as recorded in Deed Book Volume 3586 Page 899;

Thence with the westerly line of said Al Gaudinos' tract, South 21°17'19" East, a distance of 227.97 feet to a concrete monument with 1/2" iron pin set in the northerly right of way line of said Pittsburgh and Lake Erie Railroad;

Thence leaving said westerly line, along said the northerly right of way line of said Pittsburgh and Lake Erie Railroad, on the following nine (9) courses:

1. South 66°08'03" West, a distance of 433.43 feet to a concrete monument with 1/2" iron pin set;
2. on a curve deflecting to the left, having a radius of 5,779.65 feet, an arc length of 605.17 feet and subtend by a chord South 63°08'04" West, a chord distance of 604.89 feet to concrete monument with 1/2" iron pin set;

3. South 60°08'03" West, a distance of 764.20 feet to a concrete monument with 1/2" iron pin set;
4. on a curve deflecting to the left, having a radius of 1,1097.74 feet, an arc length of 295.47 feet and subtended by a chord South 59°22'09" West, a chord distance of 295.46 feet to a concrete monument with 1/2" iron pin set;
5. South 58°38'03" West, a distance of 705.07 feet to a concrete monument with 1/2" iron pin set;
6. on a curve deflecting to the left, having a radius 2,998.87 feet, an arc length of 812.96 feet and subtended by a chord South 50°52'05" West, a chord distance of 810.48 feet to a concrete monument with 1/2" iron pin set;
7. South 43°13'47" West, a distance of 1,281.63 feet to a concrete monument with 1/2" iron pin set;
8. South 45°57'31" West, a distance of 287.11 feet to a concrete monument with 1/2" iron pin set;
9. South 45°41'56" West, a distance of 20.83 feet to the **BEGINNING.**

Encompassing 46.802 acres of land, more or less, and subject to easements, right of ways, covenants and restriction of record. North and bearing system is based on Pennsylvania State Plane Coordinate System NAD83.

Exhibit C

FIGURE 4-1
Sub-Grade Soil Quality Map
Former Horsehead Corporation Site
Monaca, Pennsylvania

Date: 8/1/2023	
	Rev.

Exhibit D

ACT 2 POST REMEDIAL CARE PLAN

FORMER HORSEHEAD CORPORATION FACILITY/SHELL POLYMERS FACILITY (eFACTS PF #782002, LRP # 5-4-947-19395)

300 FRANKFORT ROAD

MONACA, PENNSYLVANIA

This document represents the Act 2 Post Remedial Care Plan for the Former Horsehead Corporation Site located at 300 Frankfort Road, Monaca, Pennsylvania. As documented in the Act 2 Final Report for the above facility, since the attainment demonstration for soil relies on engineering and institutional controls to attain a Site Specific Standard for a subset of the regulated substances addressed, a Post Remediation Care Plan (PRCP) has been developed, as required by 25 Pa Code § 250.411(d), to ensure these controls remain in place and effective to protect human health and the environment. The engineering controls include the covers over soil exceeding non-residential direct contact MSCs consisting of one of the following cover systems: structures/foundations/roads, rail yards, two feet of soil, the lined soil to groundwater areas, or the capped Brick Landfill.

A Soil Management Plan has been prepared for the new facility as part of the Act 2 Post-Remediation Care considerations in accordance with PA Code Chapter 250.708. The Soil Management Plan, which is included as Appendix M to the Act 2 Final Report, describes the remedial processes undertaken and the location/extent of impacted soils, procedures and precautions to be undertaken to limit exposure to impacted soils, the processes to be followed if these soils are to be disturbed, and material handling/management requirements. The document describes these procedures for each operational area of the future facility.

The institutional controls include several activity and use limitations to be established as environmental covenants under UECA, as discussed in Sections 5.2 and 6.3 of the Act 2 Final Report for soil and groundwater, respectively. A reference to the Soil Management Plan requiring compliance to the stated guidelines and procedures will be included in the environmental covenant language.

Six criteria are listed in 25 Pa Code Chapter § 250.204(g) and in Section II.B.3.h.xvi of the TGM for inclusion in a PRCP. These criteria and how they will be met for the Site are described below.

(1) Reporting of any instance of nonattainment

No further soil sampling or groundwater monitoring is planned or necessary to meet the attainment requirements under Act 2. Notification will be provided to the PADEP Southwest Regional Office Land Recycling Program group of any noted non-compliance with activity and use limitations specified in the environmental covenants or modifications maintenance/repairs to the engineered covers over the impacted site soils (see Item 3 below). Details for reporting are provided in Item 2 below.

(2) Reporting of measures to correct nonattainment conditions

On an annual basis, the current owner of the Property shall submit to the PADEP and any other parties as stipulated in the environmental covenant written documentation stating whether or not the activity and use limitations in the environmental covenant are being abided by. In addition, within one month after any of the following events, the then current owner of the Property shall submit to the PADEP and any other parties as stipulated in the environmental covenant any written documentation addressing the following event(s): 1) noncompliance with the activity and use limitations in this Environmental Covenant; 2) transfer of the Properties; 3) changes in use of the Properties; or 4) filing of applications for building permits for the Properties and any proposals for any site work, if the building or proposed site work will affect the contamination on the Properties subject to the environmental covenant. In addition, records of inspections and any repair activities for the various engineering control elements necessary to maintain the site-specific standard (see Item 3 below) must be maintained on Site and provided if requested by PADEP. Each annual report will be due by March 31 to cover the period of the prior calendar year.

(3) Monitoring on a quarterly basis, or as otherwise approved by the PADEP, *that demonstrates the effectiveness of the remedy and periodic reporting of monitoring results and analysis.*

No further soil sampling or groundwater monitoring is planned or necessary to demonstrate the effectiveness of the remedy. However, periodic inspection and, if necessary, maintenance of various engineering controls or monitoring points will be completed, as discussed below.

Periodic inspection of the soil liners and covers at the Brick Landfill and Eastern Consolidation Area is required. Inspections should be completed quarterly in these areas by the current property owner to document the following:

- Presence of any settlement features, erosion of soil covers, or exposure/damage to geosynthetic liner system at the Brick Landfill and Eastern Consolidation Area;
- Presence of impediments or conditions in the surrounding area which prevent storm water from flowing off the Brick Landfill or Eastern Consolidation Area;
- Presence of significant erosion of impacted soil covers in other areas of the Site which may result in exposure of underlying soils exceeding direct contact MSCs.

In addition, inspection of the culvert which conveys Poorhouse Run beneath the southern edge of the Brick Landfill and the Rag Run culvert will be completed on a quarterly basis to assess the integrity and condition of the structures. The inspection activities will include:

- Presence of any surface settlement features or cracks indicating displacement or loss of integrity of the structure;
- Identification of any exposure/damage to the geosynthetic liner material that was wrapped around the outside of the Poorhouse Run box culvert;
- Presence of impediments or conditions at the culvert inlets or outfall structures such as accumulated debris or wear or collapse of the culvert entrance/exit which prevents storm water from flowing freely through the structure;

If any of the above conditions are noted, corrective actions should be implemented and documented by the current property owner. Findings of each inspection should be captured in a summary reporting form to be maintained on Site, listing observations regarding the three above-listed items, other pertinent observations, and the nature and results of any corrective actions.

The Site is surrounded by chain link security fencing to prevent unauthorized entry onto the property and monitored with security cameras. While impacted soils are not present at the ground surface within the Act 2 Site area and thus the fencing is not specifically an engineering control necessary to maintain the Act 2 standard, the fencing does serve to provide a physical demarcation of the Site boundary to prevent unintentional entry onto the Site and unauthorized excavation of potentially affected soils. Inspections of the fence integrity will be completed at least quarterly to determine if any damage has occurred due to human activity or natural activity such as falling trees or tree limbs. If so, repair should be completed and documented. Documentation of the inspections and any necessary repair activities should be maintained on Site.

A total of 14 groundwater monitoring wells remain on the Site. Shell plans to keep these wells as permanent features at the facility based on Shell's internal corporate governance. To ensure the integrity of the wells, Shell will inspect them on a quarterly basis for any signs of damage or loss of integrity, such as cracked concrete pads, or broken or displaced well protective casings (and if so, check for missing or damaged plugs for the inner well casings). Documentation of the inspections and any necessary well repair activities should be maintained on Site.

Intentional disturbance and restoration of other engineered remedial features on-site is managed through the notification requirements and procedures outlined in the Soil Management Plan, and thus does not require periodic inspection. However, records of such activities should be maintained on Site.

Three former Horsehead production wells remain on Site. As discussed in Section 6.3, Shell plans to establish an environmental covenant restricting all future site groundwater use, and these wells are not planned to be used in the future. Shell will therefore abandon these production wells by removing any pumps, wiring, and piping before filling or grouting them in accordance with PADEP guidelines. Records of the well abandonments will be provided to PADEP and maintained on Site.

(4) Maintenance of records at the property where the remediation is being conducted for monitoring, sampling and analysis.

Records including the annual inspection reports and documentation of any necessary impacted soil disturbance and engineering control maintenance/repair activities shall be maintained at the property by the property owner.

(5) A schedule for operation and maintenance of the controls and submission of proposed changes.

Not applicable for the former Horsehead Corporation Site. Maintenance would occur only on an as-needed basis.

(6) If requested by the Department, documentation of financial ability to implement the remedy and the post remediation care plan.

After written request by the PADEP, the current property owner shall submit to the PADEP documentation of financial ability to implement the inspection and repairs, if necessary, of the items outlined in Item 3 above.

The requirements of this PRCP above will be included in or referenced within the UECA covenants to be completed following PADEP approval of this Act 2 Final Report.

The post-remediation care plan shall be amended whenever changes in operating plans or facility design, or events that occur during post-remediation care, affect the currently approved post-remediation care plan. An amendment to the post-remediation care plan shall be submitted to PADEP for approval.

Termination

Post-remediation monitoring may be terminated when monitoring provisions set forth in the above post-remediation care plan are met, the engineering controls are no longer needed, and it can be documented by fate and transport analysis that the standard will not be exceeded in the future after removal of the engineering controls. A petition to terminate post-remediation care which addresses the items above must be provided to PADEP for approval.

Exhibit E

Shell Polymers

Soil Management and Sampling Plan

Shell Polymers Monaca Facility

August 2023

Attention: Kimberly Kaal, P.G.
Environmental Manager
300 Frankfort Road
Monaca, PA 15061

Version History	Status	Date	Prepared By	Received By	Approved By
1	Draft	April 2018	ERM	Frank Jeanson	
2	Draft	August 2018	ERM	Kimberly Kaal	
3	Draft	October 2018	ERM	Kimberly Kaal	
4	Final	December 2018	ERM	Kimberly Kaal	
5	Updated	August 2023	ERM	Kimberly Kaal	

Table of Contents

Page No.

Figures

1. Remedial Site Features
2. Extent of Soil Exceeding 1 mg/kg PCBs Parcel Overview
3. Schematic of Impacted Soil During Excavation
4. AC Pond System Inlet Locations

I. Project Background

This document is a Soil Management Plan (SMP) for the Shell Polymers Monaca facility located at 300 Frankfort Road, Monaca, Beaver County, Pennsylvania (Site). This SMP documents management procedures to be followed for impacted soil and residual materials which remain on the property subsequent to the completion of the remedial activities under the Pennsylvania Land Recycling and Environmental Remediation Standards Act ("Act 2").

The facility is located on lands that were formerly used as a lead and zinc smelter between the 1930s and 2015 by Horsehead Corporation and its predecessors. As such, significant volumes of contaminated soils remain on site beneath the clean surficial layer of soil on which the facility was constructed. An important consideration to Shell was that the facility was remediated under the Act 2 program. Completion of the remediation under this program and approval by the Pennsylvania Department of Environmental Protection (PADEP) affords Shell important legal and environmental regulatory protection for long-term operation of the facility. The proper management of this soil will ensure worker safety, protection of the environment, and compliance with the engineering controls (soil covers) and institutional controls (land use restrictions) that are required to be followed as part of the Act 2 remediation. Failure to do so could result in regulatory action from PADEP.

These management procedures shall be followed if a disturbance of an engineered barrier (such as a soil/gravel cover, synthetic liner) results in the need to re-establish the barrier, and/or requires any disturbance of the remaining impacted soil or residual materials.

Figure 1 presents a map of the facility with the various production areas and locations of key utility lines. **The figure also presents important areas relating to the site remediation in which additional engineering controls beyond soil covers were utilized to achieve site regulatory closure. Procedures which should be followed if disturbance in these areas is to be undertaken are discussed within this document.**

Summary of Site Environmental Conditions Prior to Remediation

Portions of the subject property were previously operated as a lead and zinc smelter since the early 1930s. In addition to the Smelter Property, Shell addressed contiguous properties under the Act 2 program that are also part of the Site. Two of these, the former Brick Landfill and former Fly Ash Landfill, were orphan properties previously utilized by one of the previous smelter operators. The third area that is part of the Site purchased by Shell is referred to as the Southern Parcels. This unimproved land south of the old State Route 18 has not been used for any industrial activity. Investigation of these areas was completed in 2012 and 2013.

The results of soil sampling indicate that Site soils contain inorganics (metals), which exceeded default surficial non-residential direct contact Medium Specific Concentrations (MSCs) for soil applicable under the Pennsylvania Act 2 program. Lead and arsenic were the most prevalent substances exceeding direct contact MSCs. Cadmium, mercury, zinc, and antimony also exceeded direct contact MSCs, although within a significantly smaller aerial extent. Three areas within the former Smelter Property which

contain elevated concentrations of mercury have been designated "No Dig Zones". These are shown on Figure 1 and discussed in II.C.

Site-Specific Standards were developed for groundwater (based on potential discharge to the surface waters of the Ohio River) and the soil to groundwater pathway for a subset of the Site related constituents (i.e., the 14 metals parameters which exceeded the default non-residential groundwater or soil to groundwater MSCs). The areas on the Smelter Property that exceed Site-Specific soil to groundwater standards are shown on Figure 1.

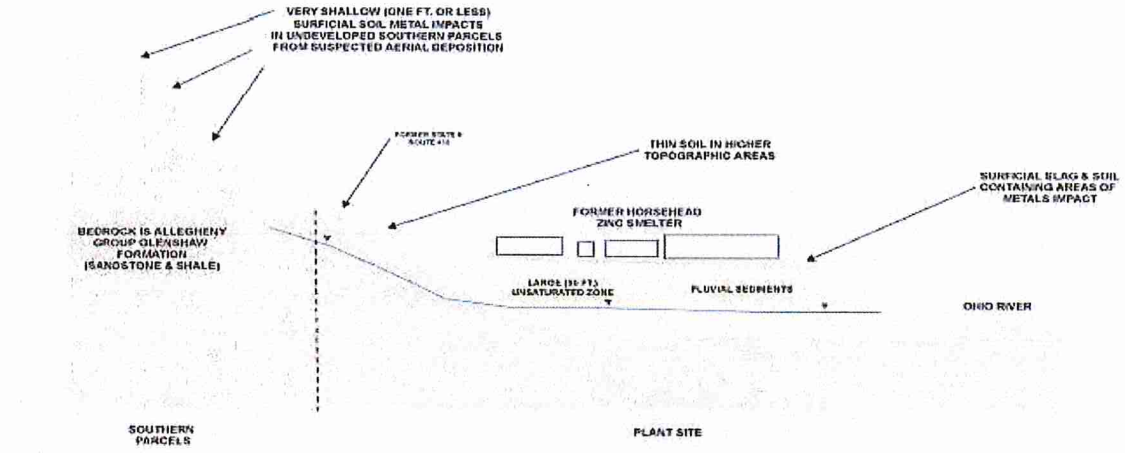
Remedial Activities

The remedial strategy for the Site was developed to achieve the objective of mitigating complete exposure pathways that present an unacceptable risk to human or ecological receptors as prescribed by the Act 2 Land Recycling Program.

Remedial activities at the Property included consolidation of excavated slag and soil that exceeded applicable standards from planned process unit areas into the former Brick Landfill and a secondary area within the former Fly Ash Landfill. The excavated slag and soil mainly came from several process unit locations including the Ethylene Cracker Unit (ECU), Polyethylene Unit (PE Unit), and the cogeneration power plant area (Cogen Area) as shown on Figure 1, along with the associated East/West and North/South Cooling water lines. In addition, soil from the Southern Parcels that exceeded applicable standards were also consolidated in the Brick Landfill.

Soils exceeding applicable standards at other locations were covered with an engineered cap that consists of aggregate, pavement, foundations, rail yard ballast, geosynthetic materials and/or at least two feet of soil. The average soil cover thickness was seven feet, with the thickest cover (typically eight to ten feet or more) placed beneath the ECU, PE Unit, and Cogen areas, and the thinnest cover (typically less than two feet) beneath the rail yards. Before and after cross-sections illustrating the remedial activities are provided below.

GENERAL CROSS-SECTION (INITIAL CONDITIONS)

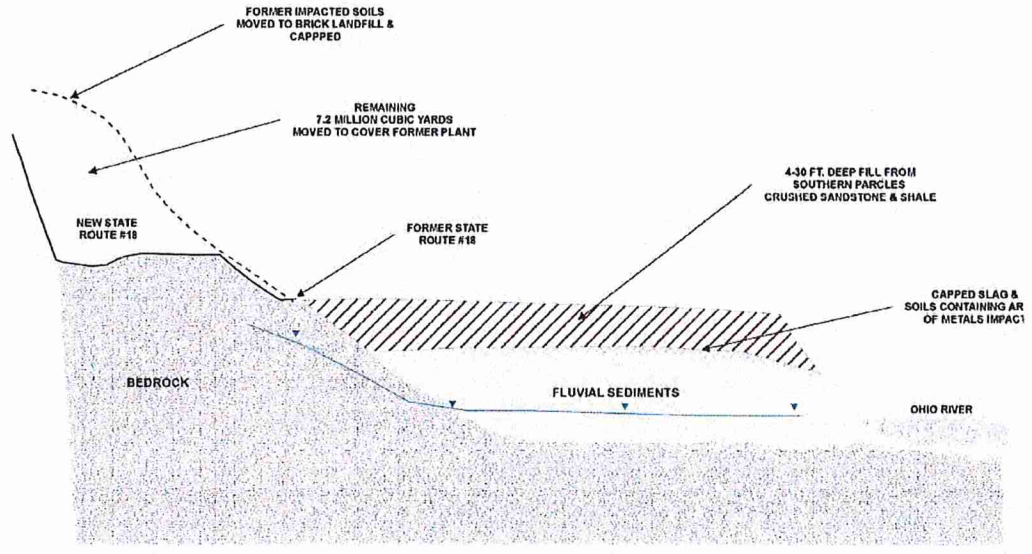


Environmental Resources Management, Inc

SCALE: NTS

November 2016

CROSS-SECTION (CURRENT CONDITIONS)



Environmental Resources Management, Inc

SCALE: NTS

Further details regarding the site remedial activities are summarized by area below, and can be found in the Act 2 Final Report for the former Horsehead Smelter Facility.

Soil classification definitions

The remedial activities completed at the Site have resulted in the presence of three different categories of soil material which may be encountered during future excavation activities. These are identified below.

The term **'impacted soil'** refers to residual materials remaining from the prior smelter operations, which contains concentrations of at least one regulated substance which exceeds the non-residential direct contact Medium Specific Concentrations (MSCs) established by the Pennsylvania Department of Environmental Protection (PADEP). These residual materials include soil, slag, brick or other solid material.

'Regulated fill' is defined in the PADEP January 16, 2021 Management of Fill Policy as soil that do not exceed the numeric values specified in Table 3 and Table 4 of the Medium Specific Concentrations (MSCs) of Appendix A in 25 Pa. Code Chapter 250, and is appropriate for use under non-residential exposure conditions. Since these limits are subject to change over time, the PADEP's website should be visited to determine the current screening values in force at the time in question Statewide Health Standards (pa.gov). The applicable numeric limit is determined by comparison of the non-residential Generic Soil to Groundwater value (used aquifers with less than 2,500 mg/L total dissolved solids) with the non-residential Direct Contact value (0-2 feet), and selection of the lower of the two values. For PCBs, an additional restriction is that the sum total of the concentrations from all PCB aroclors may not exceed 50 mg/kg (note soil exceeding 2 mg/kg total PCBs may be subject to regulation under the Toxic Substances Control Act (TSCA) – see Section IX for management of PCBs soils at the Monaca facility). Regulated fill can be spread or used within the limits of the facility as necessary and without restriction (given that the site is deed restricted for non-residential use), except that the soil cannot be placed within wetlands and waterways, and appropriate erosion and sediment control requirements in compliance with 25 Pa Code Chapter 102 must be followed.

'Clean fill' is a second category of potential cover soils defined under the PADEP January 16, 2021 Management of Fill Policy. as soil that do not exceed the numeric values specified in Table 3 and Table 4 of the Medium Specific Concentrations (MSCs) of Appendix A in 25 Pa. Code Chapter 250, and is appropriate for use under residential exposure conditions. Since these limits are subject to change over time, the PADEP's website should be visited to determine the current screening values in force at the time in question Statewide Health Standards (pa.gov). The applicable numeric limit is determined by comparison of the residential Generic Soil to Groundwater value (used aquifers with less than 2,500 mg/L total dissolved solids) with the residential Direct Contact value, and selection of the lower of the two values. For PCBs, an additional restriction is that the sum total of the concentrations from all PCB aroclors may not exceed 50 mg/kg (note soil exceeding 2 mg/kg total PCBs may be subject to regulation under the Toxic Substances Control Act (TSCA) – see Section IX for management of PCBs soils at the Monaca facility). Clean fill also cannot be placed within wetlands and waterways, and appropriate erosion and sediment control requirements in compliance with 25 Pa Code Chapter 102 must be followed. At the Shell Polymers Monaca facility, cover soils used above impacted material have been

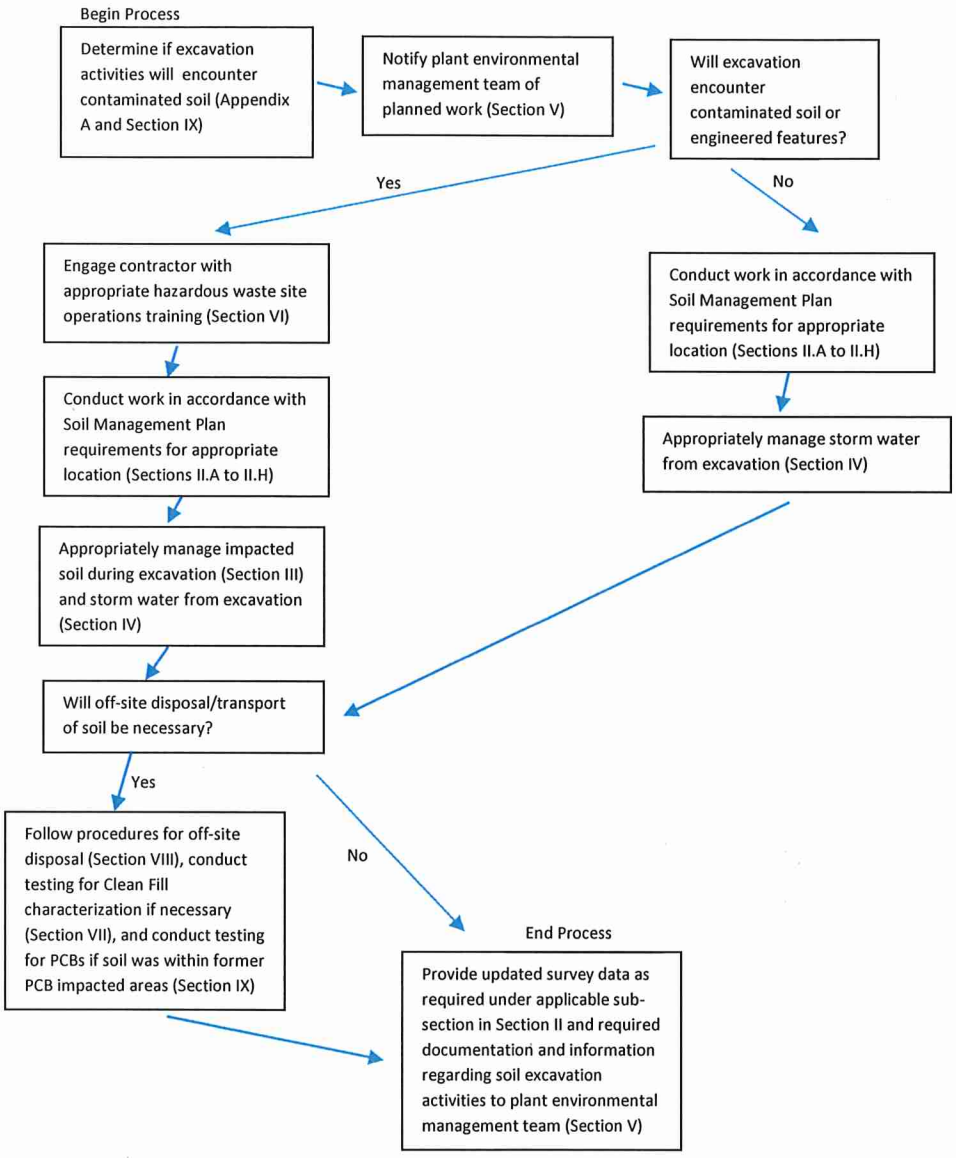
classified for use as regulated fill. If any of this cover soil material is desired to be used as clean fill, additional testing must be performed as discussed in Section VII.

II. Soil/Residual Materials Handling Procedures

As described in the previous section, at the conclusion of the remedial activities, the impacted site soils from within the footprint of future process units and Southern Parcels that were consolidated within the Brick Landfill and a portion of the Fly Ash Landfill, and impacted soils outside these areas were placed beneath at least two feet of soil fill, aggregate. concrete or asphalt covers, and/or geosynthetic liner. The purpose of this was to eliminate direct contact threats associated with the residual slag and impacted soils, and to prevent leaching of metals from soil to groundwater where this condition posed a risk. The intent of the remedial activity at the Site was to enhance the environmental conditions while maintaining the site usability. It is recognized that, under certain circumstances, activities involving disturbance of the engineered covers may be necessary during the operation of the facility. **Therefore, disturbance of the impacted materials remaining on site shall follow this soil management plan and applicable site policies and practices in order to appropriately address Shell Management of Change (MOC) guidelines.**

This section serves to set forth guidelines and procedures for such activities, including engineering aspects and soil handling guidelines on an area by area basis, notification procedures, and health and safety concerns. A flow chart is provided below as a general guide for these activities, with reference to appropriate sections of this plan.

Soil Management Process



II.A ECU, PE and Cogen units and North/South and East/West Cooling Water Lines

Description of Remedial Activities

The remedial activities in these process areas was designed to provide a zone of clean soil at depth within the limits of these units to allow construction of the unit foundations without potential direct contact exposure to impacted soils by construction workers. This was achieved through the removal of impacted slag/soil from the area of the Units and consolidation in the Brick Landfill and the Fly Ash Landfill. The foundation elevations for the future structures were identified and the necessary thickness of impacted soil was removed to that elevation. In addition, an extra foot of impacted soil was excavated below that elevation prior to placement of regulated fill material from south of State Route 18 to provide a buffer to the underlying impacted soils and allow future construction of the unit foundations without workers coming into contact with impacted soil/slag. The remainder of the excavations were then filled to final grade elevation with regulated fill.

The entirety of the ECU, PE and Cogen foundation areas and cooling water lines were backfilled to the plant design grade using regulated fill from south of State Route 18. Surveying of the ground surface within these areas was completed both prior to and subsequent to placement of backfill along a 50 foot grid. Maps showing the sub-grade surface elevations and the reported cover soil thickness are provided on Figure 4-1 in Appendix A. The extent of impacted soil remaining below the base of the regulated fill (as determined based on the analytical sampling during remediation) is also shown on the maps in Appendix A.

Soil Management Procedures

The soil within the limits of the ECU, PE and Cogen areas and cooling water lines can be excavated to the elevations for the base of the regulated fill layer shown on the drawings in Appendix A without restriction. There will be no visual demarcation between the imported fill material and the underlying native soil. Therefore, appropriate surveying control will be necessary to determine that the excavation has not exceeded the depths and/or locations where slag or impacted soil may be encountered. The survey map showing the base of the fill layer and the location of remaining impacted soils underlying the base of the excavations for the foundation areas in Appendix A should be referenced and field survey data collected in real time to verify that the excavation remains within the zone of un-impacted material established during the remedial efforts. In addition, the facility Environmental Manager or their designee should be contacted prior to commencement of this work, and may need to be present during portions of the excavation activities.

If it is determined impacted slag /soil may be excavated (as determined by survey elevations taken during excavation) and/or there is a chance find of impacted slag/soil, the procedures outlined in Section III should be followed for management of this material. This includes on-site management or off-site disposal. Requirements for management of soil to be sent off-site for disposal are discussed in Section VIII. If the material is returned to the excavation and the depth to the impacted slag/soil is shallower than previously documented, it must be noted on the documentation to be provided to Shell as discussed in Section V. Management of excavation storm water should be completed in accordance with Section IV. If soil from the foundation areas is desired to be used as Clean Fill as defined by the PADEP August 2010

Management of Fill Policy (suitable for residential use either on or off-site), additional testing must be performed as discussed in Section VII.

II.B Tank Farm/Facilities North of the PE Area

Description of Remedial Activities

The remedial activities in the future tank farms and facilities north of the PE unit was designed to provide a clean soil layer to the limits of the foundations for these units. This was achieved through limited excavation and re-location of impacted slag/soil to the Brick Landfill and importation and placement of regulated fill material from south of State Route 18. Surveying of the ground surface within these areas was completed both prior to and subsequent to placement of backfill along a 50 foot grid. Maps showing the sub-grade surface elevations and the reported cover soil thickness are provided in Figure 4-1 in Appendix A. The extent of impacted soil remaining below the fill material (as determined based on the analytical sampling during remediation) is also shown on Figure 4-1 in Appendix A.

Soil Management Procedures

The soil within the area of the tank farm and facilities north of the PE unit can be excavated to an elevation for the base of the regulated fill layer without restriction to allow for installation of necessary foundations and utilities. There will be no visual demarcation between the imported fill material used to backfill the area and the underlying impacted slag/soil. Therefore, appropriate surveying control will be necessary to determine that the excavation has not exceeded the depths where impacted slag/soil may be encountered. In addition, the facility Environmental Manager or their designee should be contacted prior to commencement of this work, and may need to be present during portions of the excavation activities.

If excavation into the soil within the tank farm and facilities north of the PE unit is planned, the survey information on Figure 4-1 in Appendix A should be referenced and compared to the planned excavation depths to verify whether the excavation could encounter underlying impacted slag/soil. If the possibility exists that impacted slag/soil could be excavated (using survey elevations taken during excavation and/or visual observations) the procedures outlined in Section III should be followed for on-site management of this material. Requirements for management of impacted soil to be sent off-site for disposal are discussed in Section VIII. If the material is returned to the excavation and the depth to the impacted slag/soil is shallower than previously documented, it must be noted on the documentation to be provided to Shell as discussed in Section V.

Regulated fill soil generated from these excavation activities can be spread or used within the limits of the future facility as necessary and without restriction, except that the soil cannot be placed within wetlands and waterways, and appropriate erosion and sediment control requirements in compliance with 25 Pa Code Chapter 102 must be followed. If soil from the foundation areas is desired to be used as clean fill, additional testing must be performed as discussed in Section VII.

Management of excavation storm water should be completed in accordance with Section IV.

II.C No Dig Zones

Description of Remedial Activities

Three areas along the northern side of the facility were designated as "No Dig Zones" based on the presence of mercury above non-residential direct contact standards (see Figure 1). Excavation into the soils within these areas is prohibited due to the specific health and safety concerns for mercury as well as the more rigorous Resource Conservation and Recovery Act (RCRA) disposal requirements for soils containing elevated mercury concentrations (potentially subject to Land Ban Disposal Restrictions). In addition, the westernmost of the three areas (No Dig Zone 3) also overlies a feature known as the 100-foot tank, which is an in-ground clarifier for the former Horsehead plant air scrubbing system. This feature was not removed during the site remediation activities.

During site remediation each of the No Dig Zones were covered with a low-permeability bentonite mat, which was overlain with an 8-inch thick concrete pad to provide a physical barrier to the underlying soil. The extent of these pads is shown on Figure 1, and a representative picture is provided below.

Photo 1 – Typical view of concrete pad installed over No Dig Zones 1, 2, and 3

The elevations of the top of the concrete pads were surveyed for future reference, and are included in Appendix A. Regulated fill material from south of State Route 18 was imported and placed over the No Dig Zones to achieve the designed final post-remediation grades

Soil Management Procedures

Soil below the concrete pad demarcating the upper limit of the No Dig Zones cannot be disturbed without advance approval by Shell Environmental Manager and must take into consideration the Resource Conservation and Recovery Act (RCRA) requirements for soil with potentially greater than 260 parts per million (ppm) mercury.

If excavation of the soil above the concrete pads demarcating the No Dig Zones is planned, the survey information in Appendix A should be referenced and compared to the planned excavation depths to verify whether the excavation will come into proximity of the concrete pad. If so, care should be taken to avoid damaging the concrete, with excavation coming no closer than one foot to the pad elevation if possible. If damage to the concrete pad occurs, in-kind repairs should be made to restore the original thickness (8-inches) of the pad. As the concrete pad itself serves as the Act 2 cover for this area, maintaining a soil cover over the concrete pads is not required for the No Dig Zones.

Soil above the concrete pad is regulated fill and may be excavated or modified as necessary for facility construction or installation of utilities/structures following plant construction. The cover soil can be spread or used within the limits of the future facility as necessary and without restriction, except that the soil cannot be placed within wetlands and waterways, and appropriate erosion and sediment control requirements in compliance with 25 Pa Code Chapter 102 must be followed. If soil above the concrete pads in the No Dig Zones is desired to be used as clean fill, additional testing must be performed as discussed in Section VII.

Management of excavation storm water should be completed in accordance with Section IV.

II.D Soil to Groundwater Leaching Areas

Description of Remedial Activities

There are seven areas on the Smelter Property and one on the Fly Ash Landfill where soil exceeded Site-Specific soil to groundwater standards and impermeable engineered caps were installed. These are shown on Figure 1. The affected soils within these areas were covered with a low-permeability (1x10-7 cm/sec or lower) geomembrane liner or structure in order to prevent future leaching of metals to groundwater. Three of these locations (identified as Areas 1, 4, and 5 on Figure 1) were coincident with the No Dig Zones discussed in Section II.C, and were covered with a bentonite mat overlaid with a concrete pad. Five of the remaining locations (Areas 2, 3, 6, 8, and 9 on Figure 1) were covered with a low-permeability geosynthetic liner (40-mil HDPE in Areas 2, 3, 6, and 9, and 80-mil HDPE in Area 8), on which regulated fill was placed up to the final remedial design grade. The eighth area (Area 7 on Figure 1) was covered with the concrete abutment for the new bridge crossing of the CSX rail line. A representative picture of the liner used to isolate areas 2, 3, 6, 8, and 9 is provided below.

Photo 2. Typical view of geosynthetic liner installed to isolate soil to groundwater concern areas.

Surveying of the top of sub-grade soil elevation prior to placement of the liner/concrete pad and backfill was completed along a 50 foot grid. Maps of these survey layers are provided in Appendix A.

Following placement of the geosynthetic liners in Areas 2, 3, and 6 a one to two foot layer of regulated fill was placed above the liner. This soil was in turn covered by orange snow fencing laid flat to provide a visual warning/demarcation of the proximity of the underlying liner. A photograph of the snow fencing placed above the liner is provided below.

Photo 3. View showing installation of snow fencing and soil placed above geosynthetic liner in soil to groundwater Areas 2 and 3.

Soil Management Procedures

The soil located above the liners at soil to groundwater Areas 2, 3, 6, 8, and 9 is regulated fill and can be spread or used within the limits of the future facility as necessary and without restriction, except that

the soil cannot be placed within wetlands and waterways, and appropriate erosion and sediment control requirements in compliance with 25 Pa Code Chapter 102 must be followed. If soil from above the liners areas is desired to be used as clean fill, additional testing must be performed as discussed in Section VII.

Appropriate surveying control during any excavation work should be completed in the soil to groundwater areas to determine that the excavation will not encounter the liner system. Orange snow fencing provides a visual demarcation/warning layer above the liner in Areas 2, 3, and 6, but not in the remaining areas. If excavation extends to the liners for the soil to groundwater areas, the liners should not be left exposed, and should be re-covered by at least two feet of regulated or clean fill material.

If impacted slag /soil is determined to be excavated in Area 7 (as determined by survey elevations taken during excavation) the procedures outlined in Section III should be followed for on-site management of this material. Requirements for management of impacted soil to be sent off-site for disposal are discussed in Section VIII. If the material is returned to the excavation and the depth to the impacted slag/soil is shallower than previously documented, it must be noted on the documentation to be provided to Shell as discussed in Section V.

Soil to groundwater Areas 1, 4, and 5 are present beneath the three No Dig Zones north of the PE unit. Considerations for excavations or sub-surface disturbance in these areas were discussed in Section II.C.

If the geomembrane liner is damaged in any of the soil to groundwater areas, repairs must be conducted by a qualified liner contractor and completed using equivalent HDPE liner material. The patch should be a minimum of twelve inches 12" (30 cm) larger in all directions than the area repaired and should be spot bonded thermally. The welding of the replacement patch should be by the extrusion fillet method. Extrusion welding requires grinding of the sheets in the area to be bonded which should be done with great care so as to avoid thinning of the sheets.

In addition to the areas mentioned above, 14 additional locations where metals concentrations exceeded the site-specific soil to groundwater standards were later reported within the post-excavation data set (see Figure 1). The remaining 14 locations were statistically demonstrated to not pose an unacceptable leaching risk when considered as part of the larger sample population within the Act 2 Final Report. However, while these areas were not capped, the soil at these locations should not be re-located to other areas on site to limit the overall distribution of soils exceeding this pathway value. Therefore, proper management of these additional areas should also be conducted as outlined in Section III.

Management of excavation storm water should be completed in accordance with Section IV.

II.E Brick Landfill

Description of Remedial Activities

The former Brick Landfill contains slag and used refractory brick from the former Horsehead facility. The landfill was used during the site remediation for consolidation of impacted slag/soil, from areas including the foundation areas for the PE, ECU and Cogen areas as well as the Southern Parcels. Prior to placing materials in the former Brick Landfill, the area of Poorhouse Run in proximity to the Brick Landfill was enclosed within a sub-grade culvert adjacent to the base of the former Brick Landfill edge (see Figure 1).

The culvert was isolated from the overlying consolidated soil and slag by wrapping the culvert with a low permeability liner of consisting of geocomposite and geomembrane, and a minimum two foot layer of clean crushed stone was placed along the sides of the structure and five feet of clean soil fill was placed along the top of the culvert. A representative picture of the culvert and surrounding isolation layer during installation is provided below.

Photo 4. View of the liner placed around the Poorhouse Run box culvert.

Once consolidation was completed, the Brick Landfill was graded to create a smooth surface and then capped with a low permeability ($1x10^{-7}$ cm/sec) synthetic liner (40-mil HDPE geomembrane), which was overlain by a geocomposite drainage layer, consisting of a geonet drainage layer and geotextile. The landfill liner was covered by at least 2 feet of clean or regulated fill material, which was graded to promote storm water control along designed drainage ways. A representative picture of the liner as installed on the Brick Landfill is included below.

Photo 5. Typical view of the low-permeability liner installed at the Brick Landfill.

Surveying of the liner edge elevations and portions of the final ground surface within the Brick Landfill cap area was completed. Maps of these survey layers are provided in Appendix A. The spot elevations of the Poorhouse Run culvert junction boxes were also surveyed and are provided in the Site Preparation Turnover Package 58NQ1160-S1002, and are shown on Figure 3-5 in Appendix A.

Subsequently during the Main Works site activities (2018-2022), additional soil was placed atop the Brick Landfill surface completed as described above. This included a mixture of impacted soil (in the central and western portions) and regulated fill. The impacted portion of this soil was capped with a low-permeability PVC geomembrane liner to the limits shown on Figure 4-7 in Appendix A, and survey data for the top of Main Works geosynthetic cap materials are also provided.

Soil Management Procedures

Excavation in the Brick Landfill area must be conducted with care. There is no visual warning layer separating the imported fill material used to backfill the area and the geosynthetic cap systems on top of the impacted slag/soil and used refractory brick, and the elevations of the liner were only surveyed along the outer edges. The survey map showing the base of the fill layer/top of liner included in Appendix A should be referenced to determine if the work will be conducted in proximity to these survey points along the cap edges, and if so, field survey data should be collected in real time to verify that the excavation remains within the zone of fill material used to complete the Brick Landfill cap. If work is to be completed within the cap area but not in proximity to the survey elevations, hand excavations should first be completed within the work area to ascertain the local soil cover thickness on top of the geomembrane liner. In addition, future modifications of the ground surface should be conducted in such a way as to not inhibit the flow of storm water along the designed storm water control features on and adjacent to the Brick Landfill.

The liners for the Brick Landfill or surrounding the Poorhouse Run culvert should not be left exposed, and should be re-covered by at least two feet of regulated or clean fill material. If the liner is damaged, repairs must be conducted by a qualified contractor and completed using equivalent HDPE liner material. The patch should be a minimum of twelve inches 12" (30 cm) larger in all directions than the area repaired and will be spot bonded thermally. The welding of the replacement patch should be by the extrusion fillet method. Extrusion welding requires grinding of the sheets in the area to be bonded which should be done with great care so as to avoid thinning of the sheets.

Fill material overlying the liner and impacted soils may be returned to the excavation or used as regulated fill and be spread or used within the limits of the future facility as necessary and without restriction, except that the soil cannot be placed within wetlands and waterways, and appropriate erosion and sediment control requirements in compliance with 25 Pa Code Chapter 102 must be followed. If the Brick Landfill cover soil is desired to be used as clean fill, additional testing must be performed as discussed in Section VII.

Management of excavation storm water should be completed in accordance with Section IV.

II.F Fly Ash Landfill (Mall Lot 2)

Description of Remedial Activities

The Fly Ash Landfill contains fly ash generated from the former George F. Wheaton coal-fired power plant located on the former zinc smelter facility. During the site remediation, impacted slag/soil from the PE and Cogen areas was consolidated within the Fly Ash landfill above the fly ash. A layer of structural stone of varying thickness was then placed over the fly ash and consolidated soil. Surveying of the ground surface within this area was completed both prior to and subsequent to placement of gravel fill along a 50 foot grid. Maps showing the sub-grade surface elevations and the reported cover soil thickness are provided on Figure 4-1 in Appendix A. The extent of impacted soil remaining below the stone layer for the rail yard (as determined based on the analytical sampling during remediation) is also shown on Figure 4-1 in Appendix A.

A rail yard consisting of an additional 12-inches of compacted stone ballast layer, railroad ties, and railroad tracks was placed on the initial gravel layer.

Soil Management Procedures

If excavation in the Fly Ash Landfill is anticipated, the survey information on Figure 4-1 in Appendix A should be referenced and compared to the planned excavation depths to verify whether the excavation will encounter underlying impacted slag/soil. If so, procedures outlined in Section III should be followed for on-site management of this material. Requirements for management of soil to be sent off-site for disposal are discussed in Section VIII. If the material is returned to the excavation and the depth to the impacted slag/soil/fly ash is shallower than previously documented, it must be noted on the documentation to be provided to Shell as discussed in Section V.

Fill material overlying the impacted soils may be returned to the excavation or used as regulated fill and be spread or used within the limits of the future facility as necessary and without restriction, except that the soil cannot be placed within wetlands and waterways, and appropriate erosion and sediment control requirements in compliance with 25 Pa Code Chapter 102 must be followed. If fill is desired to be used as clean fill, additional testing must be performed as discussed in Section VII.

One soil to groundwater concern area (Area 8) is located within the Fly Ash Landfill (see Figure 1). Additional precautions should be taken consistent with those discussed in Section II.D if excavation is planned in this area.

Management of excavation storm water should be completed in accordance with Section IV.

II.G Remaining Soils

Description of Remedial Activities

In the remaining areas on the facility outside of those process units and/or utility areas described above, the remedial activities included placement of regulated fill to provide a soil cover to mitigate direct contact potential or allow construction of the unit foundations. This regulated fill consisted of soil and crushed rock generated from excavation south of existing Route 18. Surveying of the ground surface within these areas was completed both prior to and subsequent to placement of backfill along a 50 foot grid. Maps showing the sub-grade surface elevations and the reported cover soil thickness are provided

on Figure 4-1 in Appendix A. The extent of impacted soil remaining below the base of the fill material (as determined based on the analytical sampling during remediation) is also shown on Figure 4-1 in Appendix A.

Soil Management Procedures

If excavation into the soil within the remaining areas is planned, the survey information in Appendix A should be referenced and compared to the planned excavation depths to verify whether the excavation will encounter underlying impacted slag/soil. If so, the procedures outlined in Section III should be followed for on-site management of this material. Requirements for management of soil to be sent off-site for disposal are discussed in Section VIII. If the material is returned to the excavation and the depth to the impacted slag/soil is shallower than previously documented, it must be noted on the documentation to be provided to Shell as discussed in Section V.

Fill material overlying the impacted soils may be returned to the excavation or used as regulated fill and be spread or used within the limits of the future facility as necessary and without restriction, except that the soil cannot be placed within wetlands and waterways, and appropriate erosion and sediment control requirements in compliance with 25 Pa Code Chapter 102 must be followed. It is important to note that the two feet of regulated fill closest to the pre-remediation soil elevation represents the cover for purposes of the Act 2 site closure. Thus, this minimum thickness must be maintained if permanent alteration of the post-remedial grading is contemplated. If this soil is desired to be used as clean fill, additional testing must be performed as discussed in Section VII.

If the area of excavation is outside the limits defined in Appendix A, such as in the "Southern Parcels" (i.e. the area south of the former State Route 18), the soils have not been placed under the Act 2 soil cover, and the entirety of the soil column may be considered usable as regulated fill throughout the facility as discussed above. If this soil is desired to be used as clean fill, additional testing must be performed as discussed in Section VII.

Management of excavation storm water should be completed in accordance with Section IV.

II.H Riverbank

Description of Remedial Activities

In the area between the I-376 bridge and approximately 2,000 feet to the west, exposed slag on the embankment of the Ohio River was covered with regulated fill material from south of State Route 18 to mitigate direct contact exposure risks. Due to the steep slope of the embankment, the fill material was vegetated to provide additional long-term stability.

Soil Management Procedures

Given the steep slopes in the area of the bank stabilization, disturbance of the river bank soil fill should be avoided in order to minimize the potential for significant erosion and re-exposure of the underlying slag material. However, if such activity is deemed necessary, the soil fill should be replaced and the area re-vegetated.

If impacted slag/soil is excavated from the riverbank from beneath the re-vegetated area, the procedures for handling this material on-site as outlined in Section III should be utilized. Requirements for

management of soil to be sent off-site for disposal are discussed in Section VIII. If the material is returned to the excavation and the depth to the impacted slag/soil is shallower than previously documented, it must be noted on the documentation to be provided to Shell as discussed in Section V.

To re-stabilize disturbed areas, the riverbank slag material should again be covered with regulated fill is placed to mitigate direct contact potential to the slag. Re-vegetation should be completed if necessary to make the disturbed location consistent with the surrounding area.

Management of excavation storm water should be completed in accordance with Section IV.

III. Impacted Soil Management During Excavation

If excavations are anticipated to encounter underlying impacted slag/soil within the various areas on Site, specific procedures should be followed for the management of this material.

An example conceptualized drawing illustrating the concepts related to impacted soil management has been provided as Figure 3.

Excavation

Excavated, impacted slag/soil should be segregated from the overlying fill material and staged on plastic or a similar impermeable surface while awaiting final disposition with appropriate engineering controls (e.g. temporary berms and plastic sheeting covers) to eliminate the potential for erosion to the facility drainage features and direct contact.

Open Excavation Protection

Excavations exposing impacted soils in which personnel will work will require the placement of a one-foot thick regulated fill buffer along the floor and side walls/slopes of the excavation to ensure workers do not come into contact with impacted soil during work within the excavation. Thus, the planned excavation depths should take into account the additional depth required to provide this buffer. Portions of the regulated fill originally located above the impacted soil may be used to provide this one foot buffer layer. Placement of this soil is also critical in allowing accumulated storm water in excavations to be discharged to the site storm water features without treatment (see Section IV).

Impacted Soils Stockpile Management

Excavated impacted soil stockpiles need to be managed under the following criteria:

- Segregation from the other excavated overlying fill materials
- Staged on plastic or a similar impermeable surface.
- Covered so as to prevent storm water ingress/runoff, direct contact and dust control
- Stockpile water run-off to be directed to AC drains

Final Disposition

Final disposition of the impacted slag/soil can include either returning the material to the base of the excavation with at least two feet of clean or regulated fill material placed at the surface, or sending the material off-site for disposal. Procedures for off-site disposal of material are discussed in Section VIII.

IV. Excavation/Stockpile Water Management

Given the substantial depth to groundwater present beneath the facility (with the exception of in direct proximity to the Ohio River) it is unlikely groundwater will be encountered during normal excavation activities. However, it is possible storm water may accumulate in excavations during the duration of future earthwork activities and depending upon the location, could present a risk of run-off to a receiving stream. If so, appropriate measures must be taken to ensure proper management. These are outlined below.

Water accumulated in excavations or around stockpiles where impacted soils are not exposed which must be removed should be discharged to a storm water control channel which flows to one of the facility permitted storm water management ponds, or directly to one of the storm water ponds. The water can be pumped directly to or containerized and transported to the channel or pond. The water should be discharged in a non-erosive manner to maintain the integrity of the storm water feature. Water accumulated in excavations or around stockpiles where impacted soils are exposed which must be removed should be discharged to the nearest Accidentally Contaminated (AC) water management drain/feature using the procedures discussed above. A map showing the location AC Pond system inlet features is provided as Figure 4.

If any indications of organics contamination are noted in the excavation soils or water (such as odors, staining, sheens, or field screening instrument readings), the water should not be discharged to the storm water control system. Rather, the water should be containerized separately and managed via off-site disposal or through the on-site treatment plant. The facility environmental manager should be contacted immediately upon suspicion of organics contamination in excavation water, and a representative sample should be collected for analysis of Target Compound List (TCL) volatile organic compounds and semi-volatile organic compounds. Management of this water (either on site treatment or off-site disposal) should be determined with the plant environmental staff based on the confirmed content from the analytical testing and the determination as to whether the on-site wastewater treatment system can adequately treat the organics which are found to be present.

V. Notification Procedures

Should disturbance of the Act 2 cover or the underlying consolidated materials in any of the units discussed in Section II be contemplated during or following the period of facility construction, the party planning such activities must undertake the appropriate management of change (MOC) procedures by providing written notice of their intent to complete these activities to the facility Environmental Manager at least two weeks prior to their initiation. The written notification should include the date of the planned activities, the purpose for the completing the work, and a description of the proposed methods to complete the work. The following parties, or their subsequent positional counterparts, should receive copies of the written notification:

Ms. Kimberly Kaal, P.G.
Environmental Manager
Shell Polymers Monaca Facility
300 Frankfort Road

Monaca, PA 15061
kimberly.kaal @shell.com

Mr. Jason Schultz
Environmental Engineer, Waste and Water
Shell Polymers Monaca Facility
300 Frankfort Road
Monaca, PA 15061
jason.schultz2@shell.com

The parties specified above must also be provided a notification upon completion of the excavation activities, which should include a summary of the work activities listing any deviations from the initial plan. Photographic documentation of the restored condition of the covers must also be provided along with updated survey data showing the revised elevation for impacted material that was disturbed during the soil excavation activities. The photographs should at a minimum include views of the overall in-place extent of the restored area.

VI. Health and Safety Requirements

Due to the fact that the residual materials and affected soil consolidated beneath the engineered barriers exceed direct contact residential MSCs, activities where these materials are handled must be conducted by individuals/organizations with proper applicable training/certifications. These include training/certifications set forth in the following federal guidelines:

Government Regulations	Topic
29 CFR 1910.120	Hazardous Waste Site Operations
29 CFR 1910.1000	OSHA Permissible Exposure Limit
29 CFR 1926	Construction Activities
29 CFR 1910.134	Respiratory Protection

Workers that will be working in areas where soil may be contaminated must be properly trained and have current applicable certifications and medical monitoring as may be required to perform the excavation activities in the identified impacted areas at the site. Excavation activity must have a JSA and Permit to Work prepared specifically for that activity that specifies site conditions, work activities, potential safety concerns, and measures to be taken to monitor for and protect workers from site hazards.

Qualitative action levels and safety measures, such as requiring a minimum of Level D personal protection, providing for monitoring of the breathing zone for dust, avoiding dermal contact with soil and/or groundwater, avoidance of the creation of visible dust plumes, etc. will be followed, at a minimum, as a means to identify and control worker exposures to site contamination during excavation activities.

PCB Area Designation	Elevation at which the soil should not be exposed [Elevation that triggers Low Occupancy Requirement]
1	709.80
2	709.51
3	775.80
4	Below Liner of Brick Land-Fill
5	786.00
6	770.00

If work is performed where soil below the Act 2 cover is exposed in the areas as shown on Figure 2, the Act 2 cover must be replaced following the site work. Impacted soil may be returned to the excavation and covered. If soil is to be sent off site for disposal from these areas, analysis for PCBs should be conducted in addition to any other characterization testing as discussed in Section VIII.

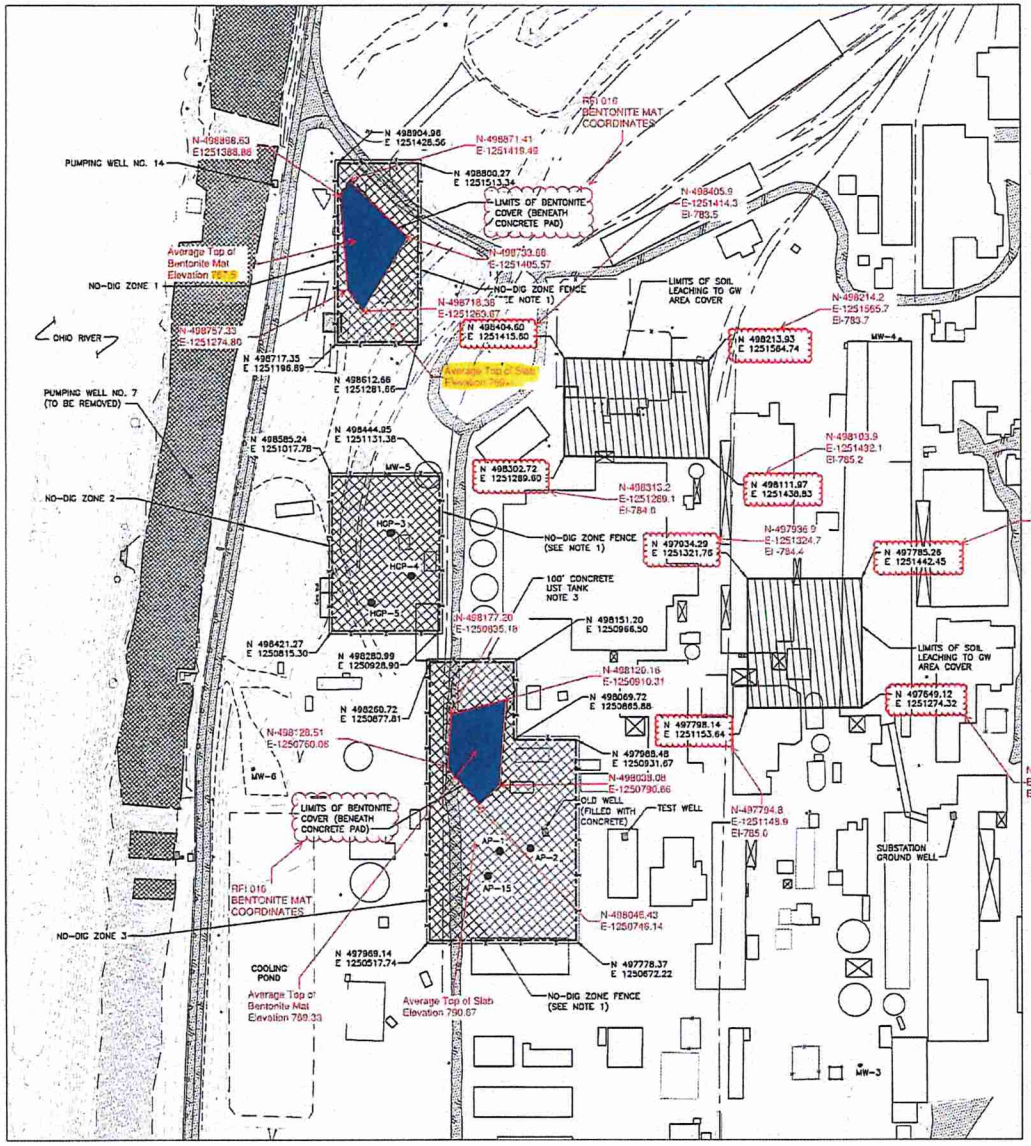
X. Appendices

Appendix A: Maps Showing Extent of Impacted Soil/Site Features

Figures

FIGURE 4-1
Sub-Grade Soil Quality Map
Former Horsehead Corporation Site
Monaca, Pennsylvania

Environmental Resources Management, Inc. Philadelphia Office 484-913-0300	Date: 8/1/2023 Drawn by: SRV Checked by:	Project Number: Rev:



PLAN

RFI 008
SOIL COVER REQUIRED BETWEEN BENTONITE MAT AND NO-DIG ZONE CAPPING

RFI 012
CONSTRUCTION JOINT
DETAIL FOR CAPS

RFI 002 FOR CLARIFICATION

NOTES:

1. FOR GENERAL EROSION/SEDIMENT CONTROL NOTES SEE DRAWING SR300.
2. WATER WELLS ARE TO REMAIN ON SITE AND UNDISTURBED. PROTECT WELLS FROM DAMAGE DUE TO ADJACENT CONSTRUCTION/DEMOLITION ACTIVITIES.
3. THE EXISTING 100' DIAMETER UNDERGROUND CONCRETE TANK, HAS BEEN EMPTIED, BACKFILLED WITH SOIL / STONE AND IS UNDER AN AREA THAT RECEIVES VEHICLE TRAFFIC, INCLUDING HEAVY TRUCKS. THE 100' DIAMETER TANK WILL NOT BE DEMOLISHED AND REMOVED, BUT WILL REMAIN IN PLACE.

NO-DIG ZONE PROCEDURES:

NO-DIG ZONES ARE TO BE COVERED WITH 8 INCH CONCRETE SLABS, WHICH WILL BE SUBSEQUENTLY COVERED WITH A MINIMUM OF 2 FEET OF FILL SOIL (BY OTHERS). NO-DIG ZONES SHALL BE REMEDIATED IN ACCORDANCE WITH THE FOLLOWING PROCEDURES.

1. CLEAR AND GRUB THE NO-DIG ZONE AREAS.
2. GRADE THE NO-DIG ZONE AREAS SMOOTH.
3. INSTALL BENTONITE MAT TO THE LIMITS SHOWN ON DRAWING.
4. INSTALL A MINIMUM 8 INCH THICK CONCRETE SLAB OVER THE NO-DIG ZONE TO THE LIMITS SHOWN ON THIS DRAWING. CONCRETE SHALL BE PLACED DIRECTLY ON THE SMOOTH SOIL SUBGRADE.
5. USE FIBER REINFORCED CONCRETE WITH A COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS AND A MINIMUM OF 5% ENTRAINED AIR.
6. THE COORDINATES FOR THE NO-DIG ZONE AREAS ARE RELATIVE TO PENNSYLVANIA STATE PLANE COORDINATES – NAD83 – PA SOUTH 3702 (GRID COORDINATES). THE VERTICAL DATUM WAS CONSTRAINED TO NAVD88 GEOID 12A.
7. FENCING SHALL BE INSTALLED BY OTHERS AT FINAL GRADE ELEVATIONS AND 5 FEET OUTSIDE THE LIMITS OF THE NO-DIG ZONE WITH SIGNS DESIGNATING "NO-DIG ZONE".

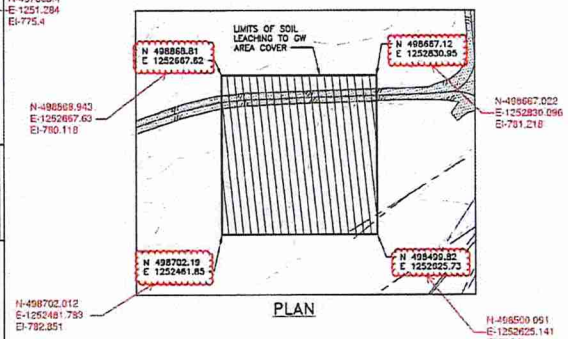
SOIL LEACHING TO GW AREA COVER PROCEDURES:

THREE AREAS ARE IDENTIFIED WHERE CONTAMINATED SOIL COULD POTENTIALLY LEACH TO THE GROUND WATER. THESE AREAS ARE TO BE COVERED WITH GEOMEMBRANE IN ACCORDANCE WITH THE FOLLOWING PROCEDURES.

1. CLEAR AND GRUB ANY EXISTING VEGETATION IN THE SOIL LEACHING AREAS.
2. EXCAVATE AREAS TO THE LINES AND GRADES SHOWN ON THE DRAWINGS PRIOR TO THE PLACEMENT OF FILL.
3. GRADE THE SOIL LEACHING AREAS SMOOTH AND ROLL WITH A STEEL DRUM ROLLER.
4. INSTALL 40-MIL PVC GEOMEMBRANE TO THE LIMITS SHOWN ON DRAWING.
5. INSTALL 6" CLEAN SOIL ABOVE GEOMEMBRANE TO HOLD IN PLACE UNTIL FILL IS PLACED OVER THE GEOMEMBRANE COVERS.
6. THE COORDINATES FOR THE SOIL LEACHING TO GROUNDWATER AREAS ARE RELATIVE TO PENNSYLVANIA STATE PLANE COORDINATES – NAD83 – PA SOUTH 3702 (GRID COORDINATES). THE VERTICAL DATUM WAS CONSTRAINED TO NAVD88 GEOID 12A.

LEGEND:

- GEOCELL LIMITS
- NO-DIG ZONE
- SOIL LEACHING TO GROUNDWATER AREA
- Limits of Bentonite Liner Placed under No Dig Concrete Slabs



PLAN

As Built TES / Mascaro 10/28/16

JACOBS
JACOBS ENGINEERING GROUP, INC.
5995 ROGERDALE ROAD
HOUSTON, TEXAS 77072
281.351.6000

SHELL CHEMICALS
FRANKLIN PROJECT
MONACA, PENNSYLVANIA

SITE PREPARATION PLAN
NO-DIG ZONES AND SOIL LEACHING AREAS

MVH	10/31/14	SBN01160	S1003	MVH	10/31/14	ISSUED FOR CONSTRUCTION	0	
BY	DATE	ESTIMATE	S.M.	BY	DATE	DESCRIPTION	SYMBOL	
APPROVED		JOB		REVISIONS				

INITIALS–		DATE	SCALE 1" = 100'
DWN BY	LLE	10-31-14	SHELL DOC NO. CMI-101-E0000-CZ-4038-00032_S1S
CHKD BY	RAM	10-31-14	GRID NUMBER / DRAWING NUMBER / REV NO
APPVD BY	MVH	10-31-14	
SUPERVISOR MVH		10-31-14	SR531 / 0

SCALE: 1"=100'

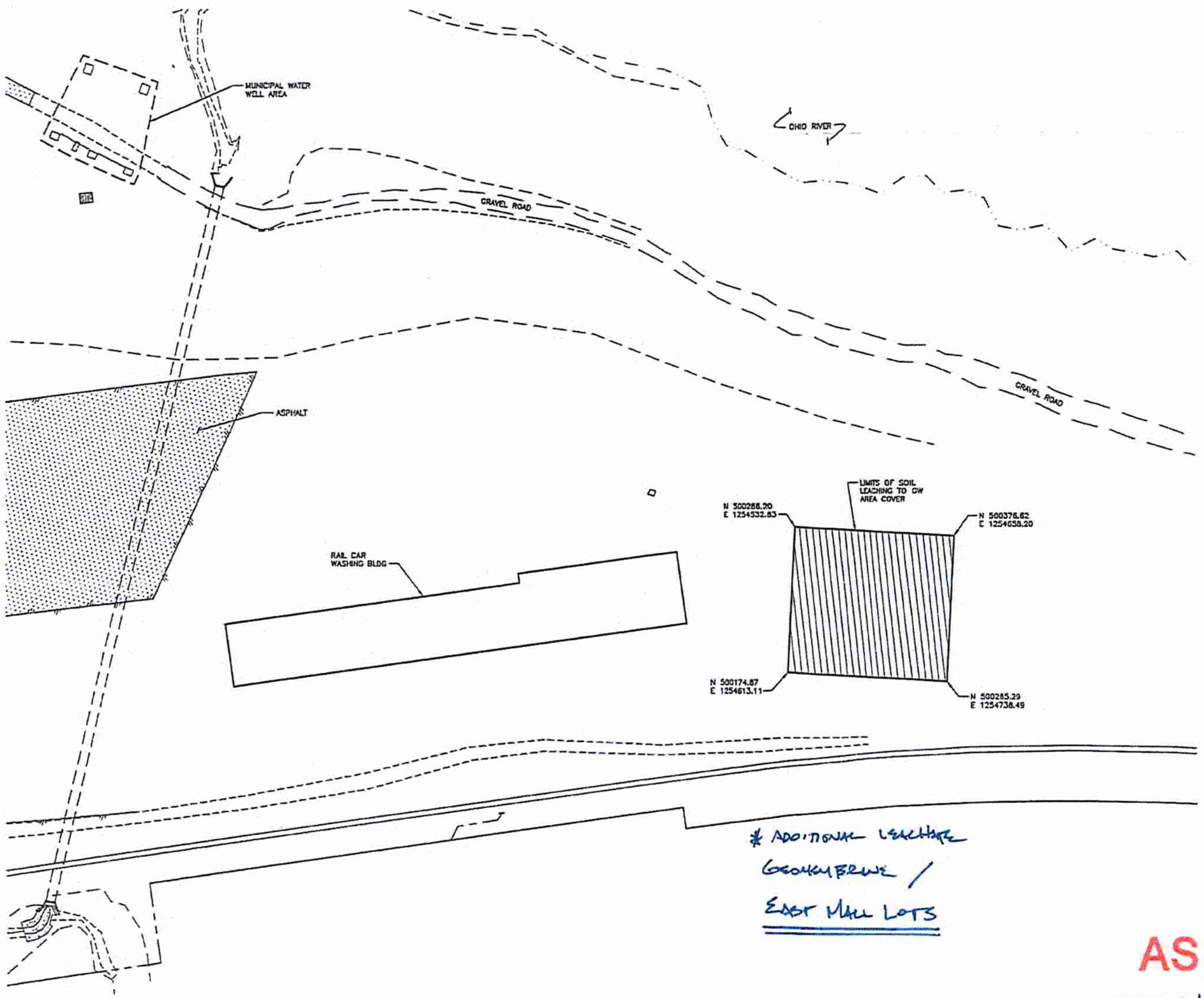
SOIL LEACHING TO GW AREA COVER PROCEDURES:

AREA IS IDENTIFIED WHERE CONTAMINATED SOIL COULD POTENTIALLY LEACH TO THE GROUND WATER. THIS AREA SHALL BE COVERED WITH GEOMEMBRANE IN ACCORDANCE WITH THE FOLLOWING PROCEDURES.

1. CLEAR AND GRUB ANY EXISTING VEGETATION IN THE SOIL LEACHING AREAS.
2. EXCAVATE AREAS TO THE LINES AND GRADES SHOWN ON THE DRAWINGS PRIOR TO THE PLACEMENT OF FILL.
3. GRADE THE SOIL LEACHING AREAS SMOOTH AND ROLL WITH A STEEL DRUM ROLLER.
4. INSTALL 40-MIL PVC GEOMEMBRANE TO THE LIMITS SHOWN ON DRAWING.
5. INSTALL 6" CLEAN SOIL ABOVE GEOMEMBRANE TO HOLD IN PLACE UNTIL FILL IS PLACED OVER THE GEOMEMBRANE COVERS.
6. THE COORDINATES FOR THE SOIL LEACHING TO GROUNDWATER AREAS ARE RELATIVE TO PENNSYLVANIA STATE PLANE COORDINATES - NAD83 - PA SOUTH 3702 (GRID COORDINATES). THE VERTICAL DATUM WAS CONSTRAINED TO NAVD88 GEOID 12A.

LEGEND:

SOIL LEACHING TO GROUNDWATER AREA



AS BUILT

DATE: 10/28/16

Trumbull / Masuro

MVH	05/19/15	58NQ1160	S1003	MVH	05/19/15	ISSUED FOR CONSTRUCTION	0
BY	DATE	ESTIMATE	B.M.	BY	DATE	DESCRIPTION	SYMBOL
APPROVED		JOB		REVISIONS			

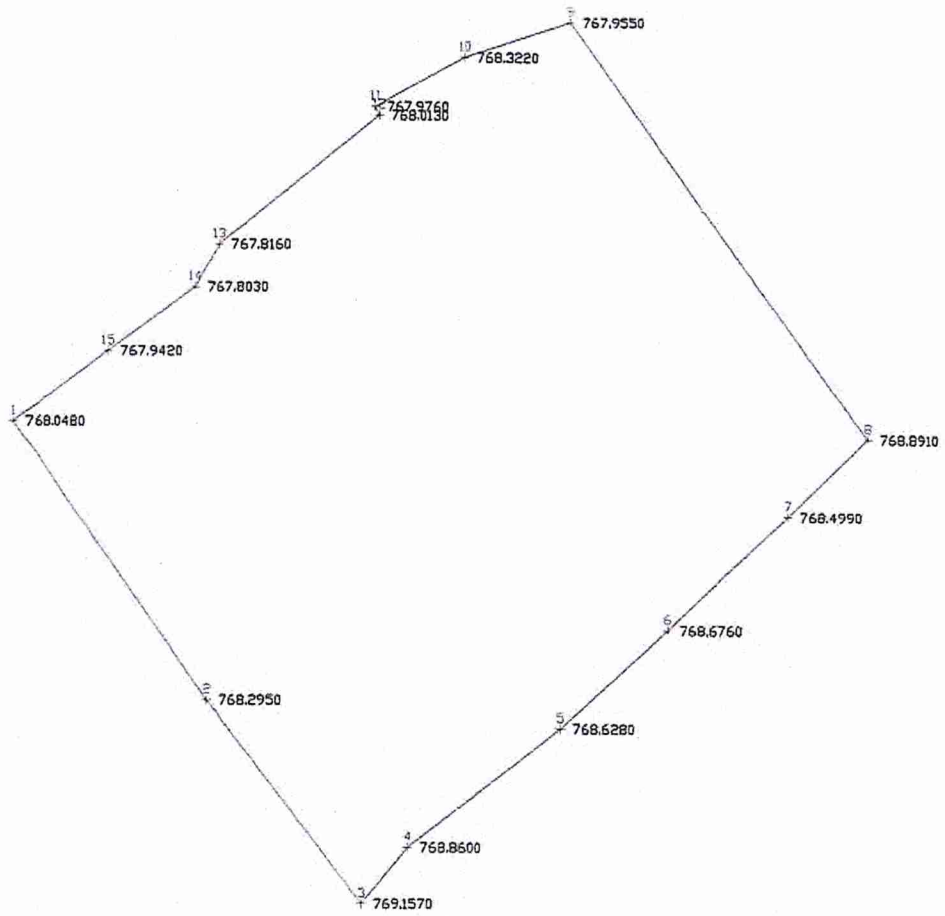
THIS DOCUMENT IS PRELIMINARY. IT IS DISTRIBUTED FOR INTERIM REVIEW ONLY AND SHALL NOT BE USED FOR PERMITTING OR CONSTRUCTION

JACOBS ENGINEERING GROUP, INC.
5995 ROGERDALE ROAD
HOUSTON, TEXAS 77072
281.351.6000

SHELL CHEMICALS
FRANKLIN PROJECT
MONACA, PENNSYLVANIA

SITE PREPARATION PLAN
SOIL LEACHING AREA

INITIALS-		DATE			
DWN BY	LLE	05-14-15	SCALE 1" = 50'		
CHKD BY	RAM	05-14-15	SHELL DOC NO. GN1-101-E0000-CX-4032-00034		
APRVD BY	MVH	05-14-15	GRID NUMBER	DRAWING NUMBER	REV NO
SUPERVISOR	MVH	05-14-15		SR532	0



ENCUMBRANCE LIMITS

EAST MALL LOTS

* REFER TO ATTACHED SURVEY DATA FOR WRITING & EXISTING COORDINATES

AS BUILT

DATE: 11/9/16

TRUMBULL / MASCARO

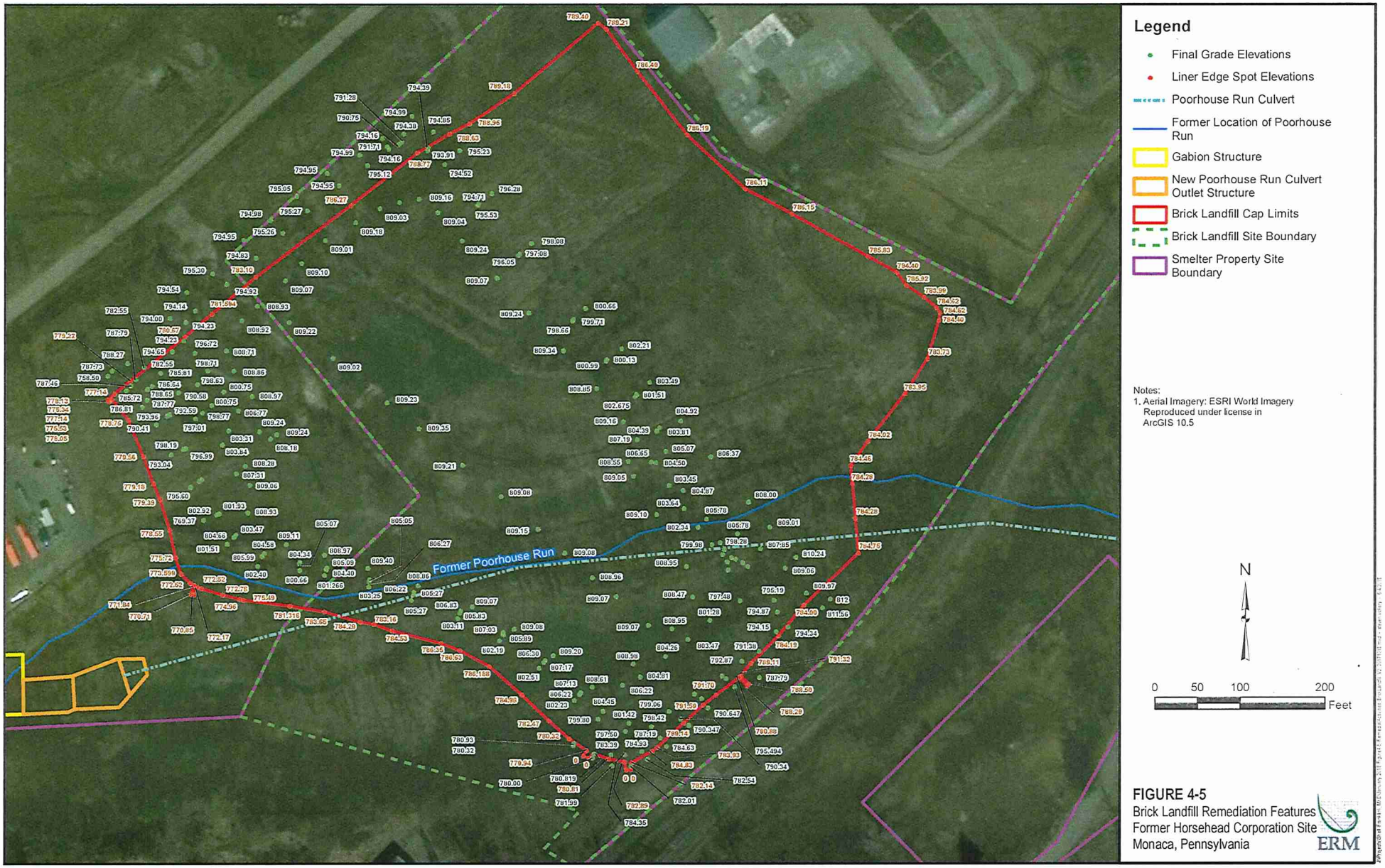


FIGURE 4-5
Brick Landfill Remediation Features
Former Horsehead Corporation Site
Monaca, Pennsylvania

ERM

BR ICKYARD LANDFI LL CAP FINAL GRADE

SHOTS TAKEN 10-31-16

1	496102.079	1250191.216	809.05	CAP FG
2	496057.398	1250218.518	809.10	CAP FG
3	495996.132	1250253.304	808.95	CAP FG
4	495960.387	1250261.22	808.48	CAP FG
5	495922.671	1250236.381	808.96	CAP FG
6	495881.271	1250191.139	808.98	CAP FG
7	495854.156	1250143.116	808.62	CAP FG
8	495890.936	1250096.765	809.20	CAP FG
9	495922.166	1250051.026	809.09	CAP FG
10	495948.758	1250001.724	809.07	CAP FG
11	495973.834	1249938.508	808.86	CAP FG
12	495994.037	1249879.529	809.40	CAP FG
13	496009.919	1249828.616	808.97	CAP FG
14	496022.371	1249783.449	809.11	CAP FG
15	496059.463	1249737.867	808.94	CAP FG
16	496091.948	1249740.504	809.06	CAP FG
17	496151.209	1249771.744	809.25	CAP FG
18	496196.787	1249742.841	808.97	CAP FG
19	496227.254	1249721.588	808.86	CAP FG
20	496251.09	1249712.224	808.71	CAP FG
21	496286.552	1249730.895	808.93	CAP FG
22	496304.069	1249748.814	808.94	CAP FG
23	496334.071	1249781.902	809.08	CAP FG
24	496354.871	1249800.707	809.11	CAP FG
25	496381.666	1249828.792	809.02	CAP FG
26	496402.635	1249864.33	809.19	CAP FG
27	496419.239	1249893.133	809.04	CAP FG
28	496426.28	1249915.859	809.10	CAP FG
29	496430.285	1249938.998	809.16	CAP FG
30	496414.43	1249961.119	809.05	CAP FG
31	496381.357	1249989.606	809.24	CAP FG
32	496337.135	1250030.268	809.08	CAP FG
33	496295.868	1250067.903	809.24	CAP FG
34	496250.839	1250108.338	809.34	CAP FG
35	496205.763	1250147.665	808.85	CAP FG
36	496166.214	1250179.02	809.17	CAP FG
37	496119.82	1250185.152	808.55	CAP FG
38	495926.718	1250208.789	809.08	CAP FG
39	495960.528	1250171.224	809.07	CAP FG
40	495983.053	1250143.233	808.96	CAP FG
41	496012.144	1250110.553	809.08	CAP FG
42	496039.716	1250079.027	809.16	CAP FG
43	496078.057	1250035.405	809.09	CAP FG
44	496115.259	1249990.344	809.22	CAP FG
45	496158.106	1249939.035	809.35	CAP FG
46	496189.454	1249901.284	809.24	CAP FG
47	496242.342	1249838.058	809.02	CAP FG
48	496284.547	1249786.273	809.22	CAP FG

49	496114.078	1249735.009	808.29	CAP FG
50	496155.857	1249715.185	803.32	CAP FG
51	496186.299	1249695.15	800.75	CAP FG
52	496210.616	1249678.167	798.64	CAP FG
53	496250.381	1249648.972	794.66	CAP FG
54	496262.732	1249662.277	795.30	CAP FG
55	496248.305	1249675.398	796.73	CAP FG
56	496227.124	1249690.289	798.72	CAP FG
57	496202.147	1249709.279	800.75	CAP FG
58	496179.575	1249726.981	802.49	CAP FG
59	496154.704	1249751.33	806.77	CAP FG
60	496146.312	1249764.482	808.18	CAP FG
61	496105.164	1249724.485	807.31	CAP FG
62	496139.036	1249707.839	803.84	CAP FG
63	496177.403	1249684.552	798.77	CAP FG
64	496170.18	1249676.464	797.01	CAP FG
65	496201.38	1249656.352	790.58	CAP FG
66	496224.562	1249635.027	785.82	CAP FG
67	496231.33	1249615.74	782.55	CAP FG
68	496208.812	1249625.291	786.64	CAP FG
69	496205.26	1249619.962	787.77	CAP FG
70	496217.005	1249606.362	787.80	CAP FG
71	496236.346	1249596.518	788.27	CAP FG
72	496227.063	1249577.973	787.73	CAP FG
73	496221.152	1249573.554	785.51	CAP FG
74	496203.616	1249594.62	785.72	CAP FG
75	496209.445	1249600.506	787.47	CAP FG
76	496192.326	1249619.219	788.66	CAP FG
77	496184.045	1249614.016	786.81	CAP FG
78	496175.015	1249645.674	792.60	CAP FG
79	496173.157	1249643.107	793.96	CAP FG
80	496163.186	1249630.178	790.42	CAP FG
81	496127.88	1249648.12	793.05	CAP FG
82	496134.13	1249661.913	798.19	CAP FG
83	496134.98	1249665.093	796.99	CAP FG
84	496098.247	1249683.231	799.47	CAP FG
85	496096.923	1249680.765	800.51	CAP FG
86	496089.793	1249670.352	795.60	CAP FG
87	496050.756	1249686.007	796.38	CAP FG
88	496057.393	1249701.624	802.93	CAP FG
89	496058.234	1249704.562	801.93	CAP FG
90	496033.036	1249724.122	803.47	CAP FG
91	496030.764	1249721.727	804.66	CAP FG
92	496022.475	1249713.922	801.52	CAP FG
93	495996.705	1249749.96	802.40	CAP FG
94	496008.002	1249754.724	805.99	CAP FG
95	496011.519	1249757.372	804.58	CAP FG
96	496001.498	1249799.498	804.35	CAP FG
97	495999.616	1249799.033	805.07	CAP FG
98	495991.7	1249799.365	800.66	CAP FG

99	495986.223	1249828.266	801.27	CAP FG
100	495992.791	1249830.534	805.09	CAP FG
101	495994.793	1249831.344	804.41	CAP FG
102	495980.604	1249881.662	805.05	CAP FG
103	495978.04	1249881.057	806.28	CAP FG
104	495972.113	1249880.383	803.25	CAP FG
105	495956.332	1249930.417	802.64	CAP FG
106	495963.055	1249933.037	806.23	CAP FG
107	495965.746	1249933.317	805.28	CAP FG
108	495943.451	1249988.349	805.83	CAP FG
109	495941.268	1249987.289	806.84	CAP FG
110	495934.695	1249985.211	803.11	CAP FG
111	495908.433	1250034.097	802.20	CAP FG
112	495915.843	1250038.569	807.03	CAP FG
113	495918.054	1250038.696	805.90	CAP FG
114	495885.263	1250087.692	806.30	CAP FG
115	495883.106	1250086.095	807.18	CAP FG
116	495876.253	1250080.647	802.51	CAP FG
117	495838.076	1250122.169	802.24	CAP FG
118	495845.192	1250127.997	807.14	CAP FG
119	495847.103	1250129.355	806.22	CAP FG
120	495825.785	1250155.477	804.46	CAP FG
121	495825.244	1250155.299	804.63	CAP FG
122	495825.185	1250155.304	804.63	CAP FG
123	495816.391	1250150.135	799.80	CAP FG
124	495801.494	1250181.823	797.51	CAP FG
125	495811.287	1250186.24	801.43	CAP FG
126	495807.375	1250212.293	798.43	CAP FG
127	495825.259	1250233.65	799.06	CAP FG
128	495845.445	1250262.942	798.07	CAP FG
129	495866.692	1250295.58	795.49	CAP FG
130	495884.055	1250318.867	792.88	CAP FG
131	495932.633	1250281.199	801.28	CAP FG
132	495909.95	1250255.374	803.48	CAP FG
133	495890.178	1250228.929	804.27	CAP FG
134	495865.891	1250199.644	804.81	CAP FG
135	495855.985	1250178.691	806.22	CAP FG
136	495865.185	1250339.348	787.80	CAP FG
137	495854.107	1250310.398	790.93	CAP FG
138	495863.49	1250300.563	792.55	CAP FG
139	495840.013	1250271.438	792.45	CAP FG
140	495829.03	1250279.174	790.65	CAP FG
141	495808.675	1250256.793	788.62	CAP FG
142	495815.916	1250247.171	790.35	CAP FG
143	495793.71	1250222.888	787.19	CAP FG
144	495783.695	1250230.605	784.63	CAP FG
145	495768.023	1250207.961	782.54	CAP FG
146	495777.869	1250201.501	784.94	CAP FG
147	495760.189	1250188.529	782.01	CAP FG
148	495773.442	1250181.557	784.35	CAP FG

149	495760.673	1250165.9	782.00	CAP FG
150	495773.605	1250164.799	783.40	CAP FG
151	495769.784	1250143.471	780.01	CAP FG
152	495774.548	1250145.607	780.82	CAP FG
153	495784.852	1250120.909	780.32	CAP FG
154	495787.237	1250121.476	780.93	CAP FG
155	495895.949	1250339.21	791.38	CAP FG
156	495919.082	1250358.894	794.15	CAP FG
157	495924.853	1250373.01	794.35	CAP FG
158	495941.989	1250360.326	794.88	CAP FG
159	495956.404	1250356.55	795.20	CAP FG
160	495996.146	1250325.456	794.83	CAP FG
161	496000.749	1250319.363	795.85	CAP FG
162	495992.079	1250302.648	797.07	CAP FG
163	495955.523	1250316.361	797.48	CAP FG
164	496004.554	1250311.673	794.94	CAP FG
165	496006.551	1250306.524	793.01	CAP FG
166	496001.524	1250301.454	793.11	CAP FG
167	496010.022	1250295.962	793.49	CAP FG
168	496016.083	1250298.045	794.42	CAP FG
169	496024.09	1250293.169	798.28	CAP FG
170	496021.854	1250283.686	799.99	CAP FG
171	496042.201	1250266.834	802.35	CAP FG
172	496064.428	1250250.758	803.65	CAP FG
173	496091.349	1250233.112	803.45	CAP FG
174	496118.13	1250217.765	804.51	CAP FG
175	496131.032	1250229.055	805.07	CAP FG
176	496118.877	1250212.166	806.66	CAP FG
177	496145.427	1250195.5	807.19	CAP FG
178	496155.219	1250218.573	804.39	CAP FG
179	496085.125	1250249.689	804.88	CAP FG
180	496051.909	1250276.92	805.79	CAP FG
181	496034.477	1250313.805	806.71	CAP FG
182	496017.068	1250340.359	807.86	CAP FG
183	495994.19	1250369.751	809.06	CAP FG
184	495964.886	1250394.387	809.97	CAP FG
185	495946.988	1250413.47	811.57	CAP FG
186	495957.796	1250422.547	812.00	CAP FG
187	496007.236	1250381.892	810.24	CAP FG
188	496042.267	1250351.578	809.01	CAP FG
189	496071.687	1250326.65	808.01	CAP FG
190	496124.98	1250282.242	806.38	CAP FG
191	496167.092	1250246.525	804.93	CAP FG
192	496159.072	1250221.692	803.82	CAP FG
193	496196.29	1250193.072	801.51	CAP FG
194	496198.551	1250194.746	802.68	CAP FG
195	496213.346	1250209.849	803.49	CAP FG
196	496253.437	1250177.187	802.21	CAP FG
197	496240.092	1250159.653	800.99	CAP FG
198	496238.809	1250158.305	800.13	CAP FG

199	496286.379	1250119.41	798.67	CAP FG
200	496288.361	1250120.626	799.72	CAP FG
201	496301.402	1250134.656	800.67	CAP FG
202	496378.091	1250071.202	798.08	CAP FG
203	496365.931	1250057.228	797.08	CAP FG
204	496364.38	1250055.603	796.05	CAP FG
205	496423.066	1250008.055	794.71	CAP FG
206	496424.759	1250009.111	795.54	CAP FG
207	496437.031	1250024.714	796.28	CAP FG
208	496487.397	1249986.587	795.24	CAP FG
209	496471.5	1249968.754	794.52	CAP FG
210	496487.501	1249948.808	793.91	CAP FG
211	496490.986	1249949.395	794.40	CAP FG
212	496509.574	1249955.375	794.86	CAP FG
213	496528.085	1249930.532	795.00	CAP FG
214	496506.622	1249921.194	794.38	CAP FG
215	496497.891	1249918.213	791.29	CAP FG
216	496494.888	1249915.135	790.76	CAP FG
217	496489.384	1249903.411	791.72	CAP FG
218	496492.551	1249901.408	791.59	CAP FG
219	496501.798	1249895.382	794.16	CAP FG
220	496482.472	1249869.611	795.00	CAP FG
221	496469.592	1249878.357	795.12	CAP FG
222	496446.419	1249845.153	794.97	CAP FG
223	496461.076	1249830.867	794.95	CAP FG
224	496433.732	1249795.164	795.06	CAP FG
225	496416.666	1249808.126	795.27	CAP FG
226	496390.917	1249779.159	795.27	CAP FG
227	496405.277	1249764.522	794.98	CAP FG
228	496382.139	1249732.852	794.96	CAP FG
229	496361.546	1249747.157	794.84	CAP FG
230	496330.096	1249712.755	794.92	CAP FG
231	496342.975	1249696.556	795.31	CAP FG
232	496320.791	1249665.878	794.54	CAP FG
233	496298.854	1249675.744	794.14	CAP FG
234	496284.694	1249664.662	794.23	CAP FG
235	496289.864	1249646.296	794.01	CAP FG

BRICK LANDFILL LINER LIMITS AND LINER ELEVATIONS

N	E	EL.
496190.860	1249574.939	778.14
496191.293	1249573.917	775.34
496192.557	1249572.793	775.53
496192.968	1249572.778	778.05
496199.765	1249581.080	778.66
496214.749	1249599.247	779.23
496267.535	1249663.660	780.68
496295.036	1249695.215	781.59
496338.994	1249747.614	783.10

496422.699	1249858.942	786.28
496484.793	1249936.869	788.77
496506.935	1249974.968	788.64
496518.817	1249997.901	788.96
496554.576	1250050.304	789.19
496637.715	1250149.229	789.41
496630.651	1250158.583	789.22
496580.17	1250194.812	786.49
496505.873	1250253.418	786.20
496442.192	1250322.124	786.12
496412.869	1250377.143	786.16
496362.383	1250466.720	785.83
496343.677	1250500.037	794.41
496328.345	1250511.549	785.93
496314.397	1250532.599	784.00
496301.888	1250547.362	784.62
496295.723	1250550.979	784.62
496286.977	1250550.108	784.40
496241.424	1250536.790	783.74
496199.366	1250510.169	783.95
496142.628	1250466.853	784.03
496114.467	1250446.581	784.46
496093.330	1250448.544	784.28
496052.600	1250452.325	784.29
496011.886	1250455.580	784.76
495950.261	1250391.560	784.01
495914.076	1250362.250	784.20
495881.612	1250329.337	789.12
495866.712	1250317.698	790.88
495857.041	1250327.370	788.29
495854.923	1250325.138	788.60
495864.662	1250315.567	791.33
495843.986	1250288.477	791.71
495832.5	1250273.745	791.60
495810.956	1250250.628	789.14
495782.047	1250219.459	784.84
495777.419	1250213.397	783.93
495764.292	1250188.914	782.15
495755.92	1250188.77	
495755.722	1250182.966	
495765.121	1250181.161	782.90
495768.802	1250162.324	780.81
495774.587	1250144.365	780.02
495769.651	1250138.856	
495772.119	1250132.444	
495778.620	1250136.413	779.94
495792.883	1250115.937	780.33
495814.271	1250091.837	782.48
495844.905	1250060.445	784.99
495878.365	1250021.983	786.19
495897.354	1249987.665	786.64
495905.82	1249965.567	786.36
495920.368	1249908.662	784.54

495928.001	1249886.48	783.16
495930.746	1249870.943	784.29
495942.91	1249828.541	783.65
495949.776	1249787.726	781.32
495956.597	1249733.166	775.49
495957.745	1249729.126	774.97
495962.829	1249708.681	773.76
495970.386	1249683.904	772.79
495962.677	1249674.323	770.86
495963.906	1249671.338	770.71
495972.355	1249678.86	772.17
495973.975	1249675.202	771.85
495976.89	1249670.702	772.52
495987.747	1249659.769	773.60
496006.798	1249653.234	775.72
496039.02	1249646.446	778.55
496075.103	1249634.84	779.39
496093.572	1249626.795	779.19
496125.587	1249615.091	779.56
496168.741	1249597.332	778.76
496193.511	1249578.014	777.14

FIGURE 4-7
Extent of Brick Landfill Main Works Liner System
Former Horsehead Corporation Site
Monaca, Pennsylvania

Environmental Resources Management
www.erm.com
ERM

Point	Northing	Easting	Elevation	Description
1	3199.914	12190.401	148.664	WEST LINER
2	3188.805	12192.748	148.829	WEST LINER
3	3166.833	12197.971	147.849	WEST LINER
4	3147.485	12208.743	146.003	WEST LINER
5	3126.246	12244.293	145.81	WEST LINER
6	3105.525	12231.149	142.169	WEST LINER
7	3080.518	12218.175	140.319	WEST LINER
8	3065.004	12211.564	137.761	WEST LINER
9	3017.047	12187.825	116.431	WEST LINER
10	3026.109	12161.901	114.24	WEST LINER
11	3041.973	12112.84	114.485	WEST LINER
12	3062.802	12086.935	113.706	WEST LINER
13	3083.999	12067.657	111.975	WEST LINER
14	3102.33	12053.752	111.887	WEST LINER
15	3117.11	12044.453	111.442	WEST LINER
16	3145.816	12029.481	112.719	WEST LINER
17	3204.381	12023.671	113.033	WEST LINER
18	3252.01	12036.552	113.414	WEST LINER
19	3301.309	12046.338	110.199	WEST LINER
20	3314.391	12059.505	105.014	WEST LINER
21	3310.922	12093.322	104.37	WEST LINER
22	3303.78	12108.101	107.354	WEST LINER
23	3295.185	12120.468	112.422	WEST LINER
24	3291.082	12143.117	112.001	WEST LINER
25	3263.04	12146.454	120.951	WEST LINER
26	3241.383	12154.14	132.093	WEST LINER
101	3115.311	12274.106	141.177	EAST LINER
102	3134.014	12288.369	141.194	EAST LINER
103	3154.42	12310.385	141.1	EAST LINER
104	3171.366	12330.39	142.577	EAST LINER
105	3184.338	12343.148	143.813	EAST LINER
106	3204.985	12343.078	143.079	EAST LINER
107	3232.407	12342.555	142.145	EAST LINER
108	3233.676	12326.175	142.623	EAST LINER
109	3234.156	12308.536	142.442	EAST LINER
110	3247.246	12303.767	135.384	EAST LINER
111	3243.546	12282.24	136.465	EAST LINER
112	3242.276	12257.121	137.278	EAST LINER
113	3239.604	12232.395	137.52	EAST LINER
114	3237.178	12203.839	138.333	EAST LINER
115	3223.674	12203.506	144.342	EAST LINER
116	3220.639	12198.146	147.933	EAST LINER
117	3217.218	12186.693	147.257	EAST LINER

Certified As-built

Project: 031703

Impacted Soils

IWP: Brickyard Liner

By: Nicole Campbell

Date: September 14, 2021

Mascaro Brick Landfill Main Works Cap Survey Data

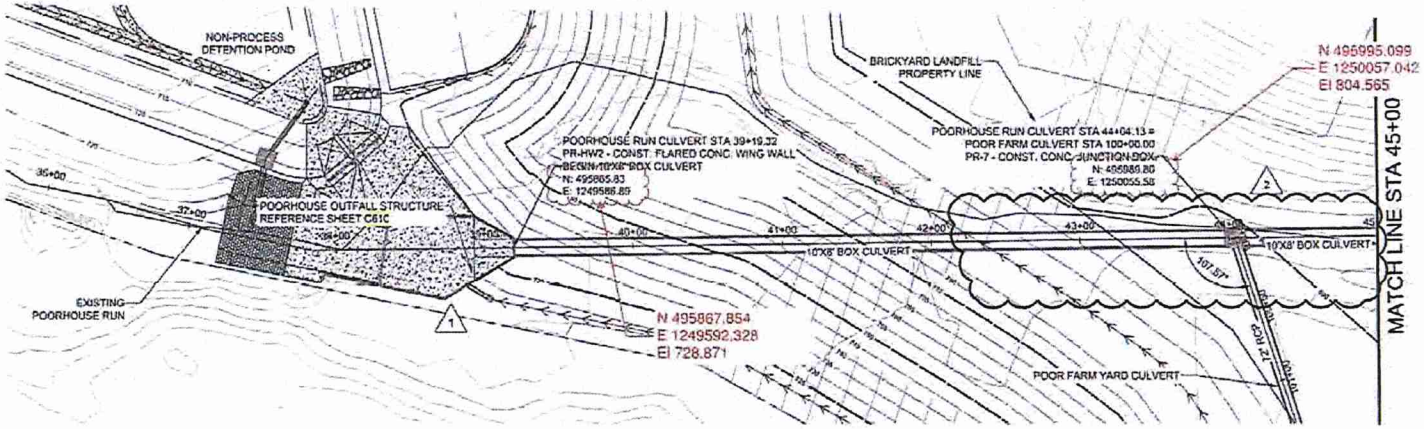
Point ID	NORTHING	EASTING	Sub-Grade Elev	NORTHING	EASTING	FG ELEV	DESC	COVER THICKNESS
1	3199.9	12190.4	148.7	3199.9	12190.4	158.3	asbFG 15feb23	9.7
2	3188.8	12192.7	148.8	3188.8	12192.7	163.9	asbFG 15feb23	15.1
3	3166.8	12198.0	147.8	3166.9	12198.0	168.4	asbFG 15feb23	20.5
4	3147.5	12208.7	146.0	3147.5	12208.9	167.7	asbFG 15feb23	21.6
5	3126.2	12244.3	145.8	3126.3	12244.4	167.9	asbFG 15feb23	22.0
6	3105.5	12231.1	142.2	3105.5	12231.2	166.2	asbFG 15feb23	24.1
7	3080.5	12218.2	140.3	3080.6	12218.2	155.9	asbFG 15feb23	15.6
8	3065.0	12211.6	137.8	3065.0	12211.6	149.1	asbFG 15feb23	11.3
9	3017.0	12187.8	116.4	3017.0	12187.8	125.0	asbFG 15feb23	8.6
10	3026.1	12161.9	114.2	3026.1	12161.8	127.5	asbFG 15feb23	13.3
11	3042.0	12112.8	114.5	3041.9	12112.8	118.1	asbFG 15feb23	3.6
12	3062.8	12086.9	113.7	3062.8	12086.8	115.9	asbFG 15feb23	2.2
13	3084.0	12067.7	112.0	3084.0	12067.7	114.1	asbFG 15feb23	2.2
14	3102.3	12053.8	111.9	3102.3	12053.9	114.1	asbFG 15feb23	2.2
15	3117.1	12044.5	111.4	3117.0	12044.4	113.7	asbFG 15feb23	2.2
16	3145.8	12029.5	112.7	3145.9	12029.5	115.1	asbFG 15feb23	2.4
17	3204.4	12023.7	113.0	3204.3	12023.7	115.1	asbFG 15feb23	2.1
18	3252.0	12036.6	113.4	3252.1	12036.6	115.5	asbFG 15feb23	2.1
19	3301.3	12046.3	110.2	3301.3	12046.3	112.4	asbFG 15feb23	2.2
20	3314.4	12059.5	105.0	3314.5	12059.5	107.6	asbFG 15feb23	2.6
21	3310.9	12093.3	104.4	3310.9	12093.3	107.6	asbFG 15feb23	3.2
22	3303.8	12108.1	107.4	3303.7	12108.2	111.6	asbFG 15feb23	4.2
23	3295.2	12120.5	112.4	3295.1	12120.5	114.5	asbFG 15feb23	2.1
24	3291.1	12143.1	112.0	3291.1	12143.1	114.4	asbFG 15feb23	2.4
25	3263.0	12146.5	121.0	3263.0	12146.4	124.0	asbFG 15feb23	3.1
26	3241.4	12154.1	132.1	3241.3	12154.1	135.8	asbFG 15feb23	3.7
101	3115.3	12274.1	141.2	3115.3	12274.2	167.5	asbFG 15feb23	26.3
102	3134.0	12288.4	141.2	3134.0	12288.5	163.0	asbFG 15feb23	21.8
103	3154.4	12310.4	141.1	3154.4	12310.3	151.7	asbFG 15feb23	10.6
104	3171.4	12330.4	142.6	3171.4	12330.4	151.3	asbFG 15feb23	8.7
105	3184.3	12343.1	143.8	3184.4	12343.1	146.4	asbFG 15feb23	2.6
106	3205.0	12343.1	143.1	3205.0	12343.1	145.6	asbFG 15feb23	2.5
107	3232.4	12342.6	142.1	3232.4	12342.6	144.5	asbFG 15feb23	2.4
108	3233.7	12326.2	142.6	3233.7	12326.3	144.7	asbFG 15feb23	2.0
109	3234.2	12308.5	142.4	3234.1	12308.6	144.6	asbFG 15feb23	2.1
110	3247.2	12303.8	135.4	3247.1	12303.8	137.8	asbFG 15feb23	2.4
111	3243.5	12282.2	136.5	3243.6	12282.3	139.5	asbFG 15feb23	3.1
112	3242.3	12257.1	137.3	3242.1	12257.2	139.5	asbFG 15feb23	2.3
113	3239.6	12232.4	137.5	3239.5	12232.5	139.6	asbFG 15feb23	2.1
114	3237.2	12203.8	138.3	3237.1	12203.9	140.8	asbFG 15feb23	2.4
115	3223.7	12203.5	144.3	3223.7	12203.6	146.4	asbFG 15feb23	2.1
116	3220.6	12198.1	147.9	3220.6	12198.2	150.4	asbFG 15feb23	2.4
117	3217.2	12186.7	147.3	3217.1	12186.7	149.6	asbFG 15feb23	2.3

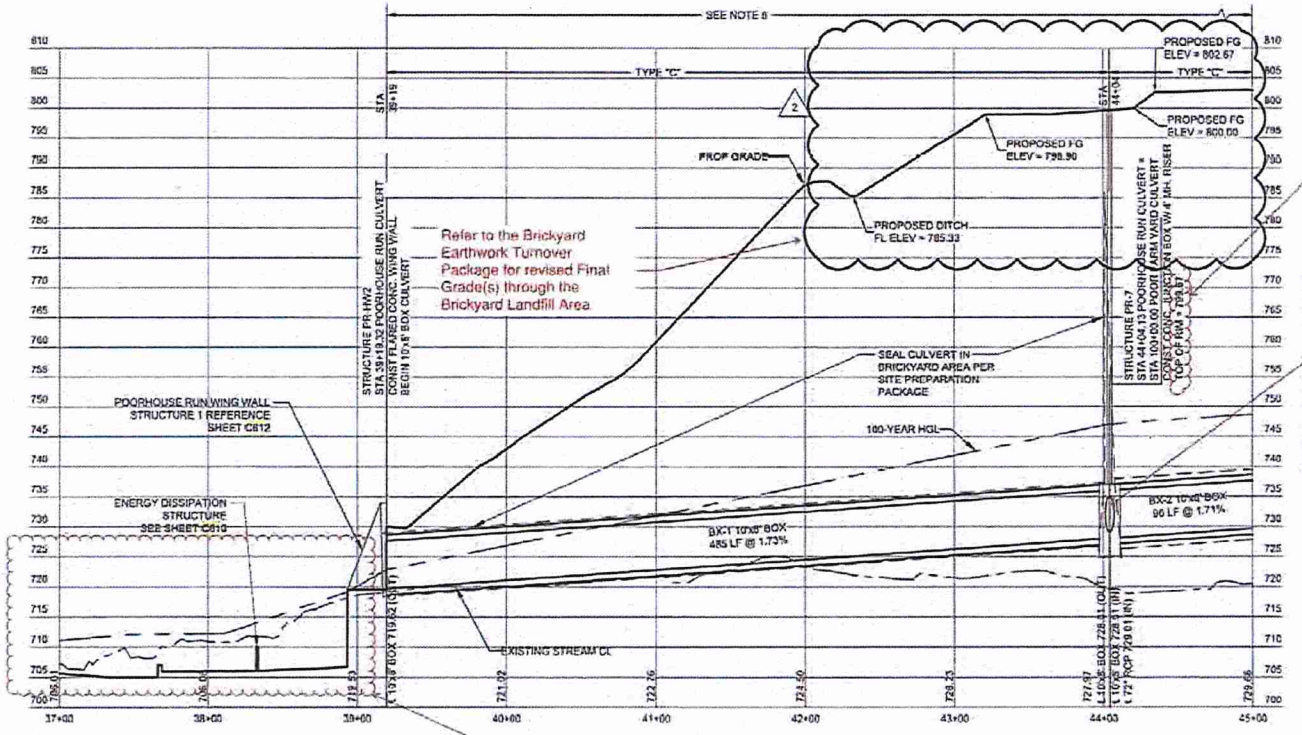
Note: Elevations in plant coordinate system. Add 696.0 to convert to PA State Plane elevations.

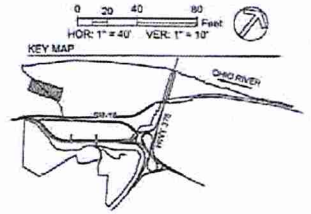
Mascaro Brick Landfill Main Works Cap Survey Data

Point ID	NORTHING	EASTING	Sub-Grade Elev	NORTHING	EASTING	FG ELEV	DESC	COVER THICKNESS
1	3027.9	12198.4	119.1	3027.8	12198.5	128.0	asbFG 15feb23	8.9
2	3040.4	12148.0	117.4	3040.4	12148.0	128.8	asbFG 15feb23	11.4
3	3050.5	12101.1	114.7	3050.6	12101.2	116.9	asbFG 15feb23	2.2
4	3095.6	12061.9	113.6	3095.6	12062.0	115.6	asbFG 15feb23	2.0
5	3147.9	12032.2	113.9	3147.9	12032.2	116.4	asbFG 15feb23	2.5
6	3173.5	12017.9	112.3	3173.4	12017.8	114.3	asbFG 15feb23	2.1
7	3217.3	12026.1	112.3	3217.3	12026.1	114.3	asbFG 15feb23	2.0
8	3273.8	12039.8	111.6	3273.9	12039.8	113.9	asbFG 15feb23	2.4
9	3296.9	12045.3	110.0	3296.8	12045.3	112.1	asbFG 15feb23	2.1
10	3314.0	12059.9	103.8	3313.9	12059.9	106.1	asbFG 15feb23	2.3
11	3312.4	12074.5	104.5	3312.5	12074.6	106.8	asbFG 15feb23	2.3
12	3293.1	12075.9	112.4	3293.1	12075.9	114.9	asbFG 15feb23	2.5
13	3261.0	12078.6	122.2	3260.9	12078.6	125.4	asbFG 15feb23	3.2
14	3247.0	12076.1	127.1	3247.0	12076.1	129.6	asbFG 15feb23	2.5
15	3208.8	12067.2	128.0	3208.8	12067.1	130.7	asbFG 15feb23	2.7
16	3161.8	12071.8	128.3	3161.8	12071.9	131.7	asbFG 15feb23	3.5
17	3119.3	12086.1	126.9	3119.3	12086.1	129.3	asbFG 15feb23	2.4
18	3089.8	12102.5	126.6	3089.8	12102.7	128.7	asbFG 15feb23	2.1
19	3086.6	12118.6	125.8	3086.6	12118.6	130.5	asbFG 15feb23	4.7
20	3081.5	12133.2	129.1	3081.4	12133.3	133.9	asbFG 15feb23	4.8
21	3070.2	12159.3	127.9	3070.2	12159.3	139.7	asbFG 15feb23	11.9
22	3059.4	12186.8	128.9	3059.4	12186.8	145.5	asbFG 15feb23	16.7
23	3049.2	12209.6	131.4	3049.2	12209.7	140.6	asbFG 15feb23	9.2
24	3062.3	12217.5	139.5	3062.1	12217.4	147.1	asbFG 15feb23	7.6
25	3082.0	12184.3	139.4	3082.1	12184.4	150.2	asbFG 15feb23	10.8
26	3096.8	12158.4	138.6	3096.6	12158.4	145.3	asbFG 15feb23	6.8
27	3114.6	12137.5	137.9	3114.5	12137.5	142.8	asbFG 15feb23	4.9
28	3137.9	12122.7	137.5	3137.9	12122.7	142.9	asbFG 15feb23	5.4
29	3158.1	12107.3	140.8	3158.1	12107.4	142.8	asbFG 15feb23	2.1
30	3176.1	12109.3	143.2	3176.0	12109.4	146.0	asbFG 15feb23	2.8
31	3209.7	12112.6	144.2	3209.8	12112.6	146.5	asbFG 15feb23	2.3
32	3223.7	12117.2	137.9	3223.6	12117.2	142.7	asbFG 15feb23	4.8
33	3247.5	12118.7	127.4	3247.4	12118.7	132.8	asbFG 15feb23	5.4
34	3271.8	12117.3	116.3	3271.7	12117.3	120.8	asbFG 15feb23	4.5
35	3273.0	12143.6	116.9	3273.0	12143.5	119.1	asbFG 15feb23	2.2
36	3249.1	12149.5	128.1	3249.0	12149.6	131.6	asbFG 15feb23	3.5
37	3231.7	12169.1	138.8	3231.6	12169.2	141.4	asbFG 15feb23	2.6
38	3220.9	12175.7	143.9	3220.8	12175.7	147.2	asbFG 15feb23	3.4
39	3207.5	12167.7	145.1	3207.3	12167.8	153.4	asbFG 15feb23	8.3
40	3172.6	12167.1	144.0	3172.6	12167.2	166.3	asbFG 15feb23	22.3
41	3143.5	12188.6	143.0	3143.5	12188.7	167.7	asbFG 15feb23	24.7
42	3121.6	12208.3	142.0	3121.6	12208.4	168.2	asbFG 15feb23	26.2
43	3101.7	12230.4	141.4	3101.8	12230.4	165.0	asbFG 15feb23	23.6
44	3086.1	12246.8	141.6	3086.2	12246.9	157.8	asbFG 15feb23	16.2
45	3057.2	12242.2	140.7	3057.2	12242.3	143.4	asbFG 15feb23	2.7
46	3073.8	12243.1	141.0	3073.9	12243.2	151.7	asbFG 15feb23	10.7
47	3084.2	12223.8	140.6	3084.2	12223.8	157.5	asbFG 15feb23	16.9
48	3102.4	12196.5	140.7	3102.5	12196.6	160.1	asbFG 15feb23	19.5
49	3124.3	12172.1	141.3	3124.3	12172.2	156.9	asbFG 15feb23	15.6
50	3154.2	12149.9	142.5	3154.1	12149.9	156.3	asbFG 15feb23	13.8
51	3178.1	12146.0	144.0	3177.9	12146.0	159.3	asbFG 15feb23	15.3
52	3204.6	12142.6	144.8	3204.5	12142.5	152.7	asbFG 15feb23	7.9
53	3202.6	12094.0	138.6	3202.6	12094.1	141.2	asbFG 15feb23	2.6
54	3176.9	12094.4	137.9	3176.9	12094.5	141.1	asbFG 15feb23	3.2
55	3151.6	12093.0	134.2	3151.5	12092.9	137.2	asbFG 15feb23	3.0
101	3329.1	11980.1	82.1	3329.1	11980.1	95.3	asbFG 15feb23	13.2
102	3330.1	11979.6	79.3	3330.2	11979.6	95.1	asbFG 15feb23	15.8
103	3331.8	11979.5	79.5	3331.8	11979.5	95.1	asbFG 15feb23	15.6
104	3332.1	11979.8	82.1	3332.1	11979.7	95.1	asbFG 15feb23	13.1
105	3332.2	11990.5	82.7	3332.3	11990.5	95.5	asbFG 15feb23	12.9
106	3332.4	12014.0	83.2	3332.4	12014.1	95.8	asbFG 15feb23	12.6
107	3332.9	12097.3	84.7	3332.8	12097.3	98.6	asbFG 15feb23	13.9
108	3334.4	12139.1	85.6	3334.4	12139.2	101.7	asbFG 15feb23	16.1
109	3335.6	12207.5	87.1	3335.6	12207.6	104.0	asbFG 15feb23	16.9
110	3330.6	12346.7	90.3	3330.5	12346.7	108.9	asbFG 15feb23	18.6
111	3329.8	12446.4	92.8	3329.7	12446.4	98.6	asbFG 15feb23	5.8
112	3323.0	12489.9	92.6	3323.1	12489.9	100.1	asbFG 15feb23	7.5
113	3317.8	12515.2	93.0	3317.8	12515.3	100.0	asbFG 15feb23	7.0
114	3312.6	12578.4	93.2	3312.7	12578.4	98.9	asbFG 15feb23	5.7
115	3315.0	12707.6	93.4	3324.5	12711.2	99.8	asbFG 15feb23	6.4
115	3315.0	12707.6	93.4	3324.4	12699.6	99.9	asbFG 15feb23	6.5
116	3303.6	12710.5	93.2	3303.6	12733.3	99.9	asbFG 15feb23	6.7
117	3241.6	12706.9	90.5	3241.6	12735.3	100.0	asbFG 15feb23	9.5
118	3146.9	12705.6	90.2	3147.0	12705.7	100.3	sbFG conc 15feb23	10.1
119	3054.2	12719.0	90.1	3054.3	12719.0	100.3	sbFG conc 15feb23	10.1
120	2996.8	12743.3	90.2	2996.8	12743.2	100.1	asbFG 15feb23	9.9
121	2901.2	12781.1	89.8	2901.2	12781.1	99.9	asbFG 15feb23	10.0

Note: Elevations in plant coordinate system. Add 696.0 to convert to PA State Plane elevations.







NOTES

1. BOX CULVERT TYPE CLASSIFICATION:
   1. TYPE "A" - PER PENN DOT SPECIFICATION & STANDARD
   2. TYPE "B" - PER RAILROAD SPECIFICATION & STANDARD
   3. TYPE "C" - PER ASTM DESIGN STANDARD
2. REFER TO SHEETS C692-C694 FOR BOX CULVERT REINFORCING AND DETAILS.
3. REFER TO SHEETS C690-C691 FOR JUNCTION BOX REINFORCING DETAILS.
4. ALL WING WALLS WILL BE CAST-IN-PLACE PER DETAILS ON SHEETS C640 OR C641. ALL REBAR SHALL BE EPOXY-COATED REINFORCEMENT AND ALL CEMENT SHALL BE TYPE II SULFATE RESISTANT CEMENT. REFER TO SHEET C611.
5. REFER TO SHEET C613 FOR BOX CULVERT INSTALLATION, BEDDING AND BACKFILL DETAIL.
6. ALL CULVERT, DRAINAGE STRUCTURES AND RELATED EARTHWORK CONSTRUCTION FROM POORHOUSE RUN CULVERT STATION 39+19.32 TO STATION 48+79.98 AND POOR FARM YARD CULVERT STATION 100+00.00 TO STATION 103+19.68 SHALL BE PERFORMED BY A HAZWOPER TRAINED CONTRACTOR UNDER THE SITE PREPARATION CONTRACT PACKAGE. PIPES AND STRUCTURES WITHIN THESE LIMITS SHALL BE SEALED PER SITE PREPARATION PACKAGE. POORHOUSE RUN JUNCTION BOX PR-6 & ALL CULVERTS & STRUCTURES UPSTREAM OF STATION 48+79.98 WILL BE INSTALLED BY CONTRACTOR. POOR FARM RUN JUNCTION BOX PF-10 & ALL CULVERTS & STRUCTURES UPSTREAM OF STATION 103+19.68 WILL BE INSTALLED BY CONTRACTOR.
7. NORTHINGS AND EASTINGS OF ALL MANHOLES, JUNCTION BOXES, INLETS AND WINGWALLS ARE GIVEN AT CONTROL POINTS LOCATED AT THE CENTER OF THE STRUCTURE. REFER TO STRUCTURAL DETAILS FOR EXACT LOCATION.
8. CONTRACTOR SHALL LIMIT DISTURBANCE OF EXIST. PILE TO THE WORK REQUIRED TO INSTALL THE SHEET PILES.

As Built Trumbull / Mascaro 5/15/16

JACOBS
JACOBS ENGINEERING GROUP, INC.
5995 ROGERDALE ROAD
HOUSTON, TEXAS 77072
281.351.8000

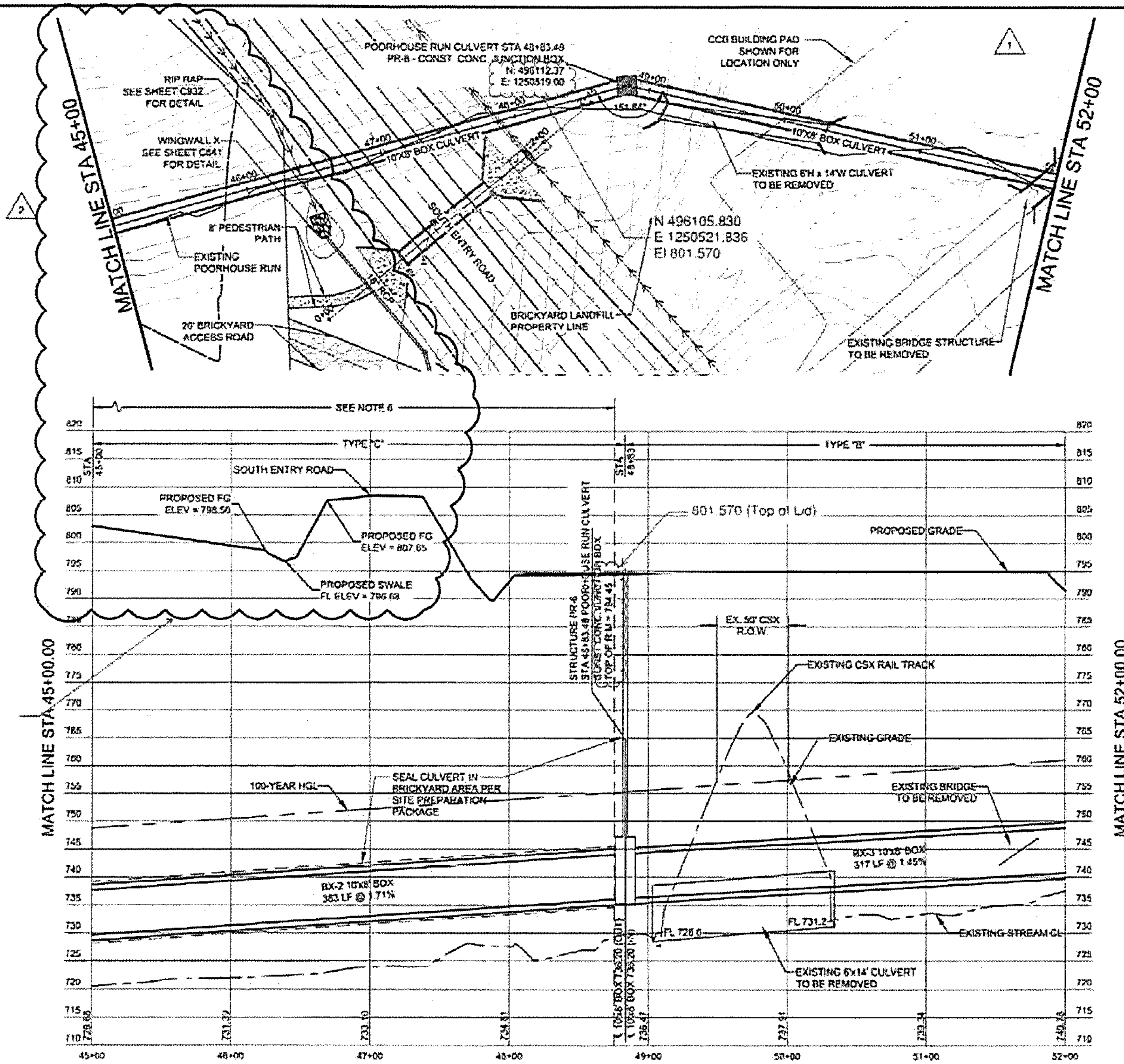
SHELL CHEMICALS
FRANKLIN PROJECT
MONACA, PENNSYLVANIA

POORHOUSE RUN CULVERT

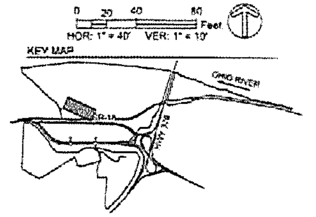
BY	DATE	DESCRIPTION	SYMBOL
MVH	02/29/16	IFC, UPDATED GRADING	3
MVH	01/27/15	IFC, UPDATED POORHOUSE RUN OUTFALL	2
MVH	09/18/14	ISSUED FOR CONSTRUCTION	1

INITIALS	DATE
DWN BY: AGH	02-25-16
CHKD BY: AQR	02-25-16
APPVD BY: RJA	02-25-16
SUPERVISOR MVH	02-25-16

SCALE: HOR: 1" = 40' VERT: 1" = 5'
SHELL DOC NO.: CM1-100-E0000-CX-4238-03009
GRID NUMBER:
DRAWING NUMBER: C601
REV NO: 2



Refer to the Brickyard Earthwork Turnover Package for revised Final Grade(s) through the Brickyard Landfill Area



NOTES

1. BOX CULVERT TYPE CLASSIFICATION.
   1. TYPE "A" - PER PENN DOT SPECIFICATION & STANDARD
   2. TYPE "B" - PER RAILROAD SPECIFICATION & STANDARD
   3. TYPE "C" - PER ASTM DESIGN STANDARD
2. REFER TO SHEETS C692-C694 FOR BOX CULVERT REINFORCING AND DETAILS.
3. REFER TO SHEETS C690-C691 FOR JUNCTION BOX REINFORCING DETAILS.
4. ALL WING WALLS WILL BE CAST-IN-PLACE PER DETAILS ON SHEETS C640 OR C641. ALL REBAR SHALL BE EPOXY-COATED REINFORCEMENT AND ALL CEMENT SHALL BE TYPE II SULFATE RESISTANT CEMENT. REFER TO SHEET C911.
5. REFER TO SHEET C913 FOR BOX CULVERT INSTALLATION BEDDING AND BACKFILL DETAIL.
6. ALL CULVERT, DRAINAGE STRUCTURES AND RELATED EARTHWORK CONSTRUCTION FROM POORHOUSE RUN CULVERT STATION 39+19.32 TO STATION 48+79.98 AND POOR FARM YARD CULVERT STATION 100+00.00 TO STATION 103+19.68 SHALL BE PERFORMED BY A HAZWOPER TRAINED CONTRACTOR UNDER THE SITE PREPARATION CONTRACT PACKAGE. PIPES AND STRUCTURES WITHIN THESE LIMITS SHALL BE SEALED PER SITE PREPARATION PACKAGE. POORHOUSE RUN JUNCTION BOX PR-8 & ALL CULVERTS & STRUCTURES UPSTREAM OF STATION 48+79.98 WILL BE INSTALLED BY CONTRACTOR. POOR FARM RUN JUNCTION BOX PF-10 & ALL CULVERTS & STRUCTURES UPSTREAM OF STATION 103+19.68 WILL BE INSTALLED BY CONTRACTOR.
7. NORTHINGS AND EASTINGS OF ALL MANHOLES, JUNCTION BOXES, INLETS AND WINGWALLS ARE GIVEN AT CONTROL POINTS LOCATED AT THE CENTER OF THE STRUCTURE. REFER TO STRUCTURAL DETAILS FOR EXACT LOCATION.
8. CONTRACTOR SHALL LIMIT DISTURBANCE OF EXIST. PILE TO THE WORK REQUIRED TO INSTALL THE SHEET PILES.

As Built
Trumbull / Mascaro
5/15/16

JACOBS
JACOBS ENGINEERING GROUP INC
5995 ROGERDALE ROAD
HOUSTON, TEXAS 77072
281 351 8000

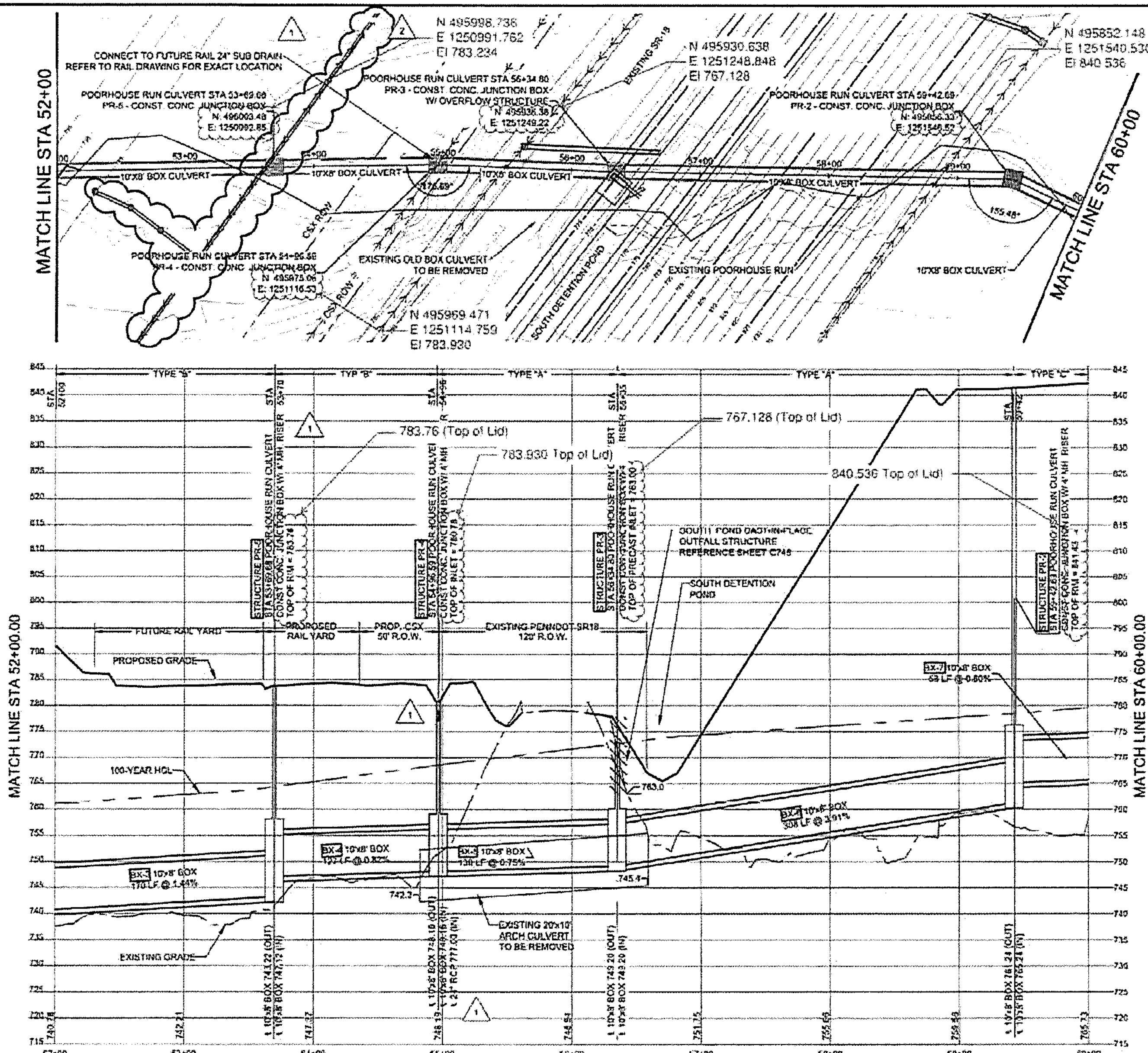
SHELL CHEMICALS
FRANKLIN PROJECT
MONACA, PENNSYLVANIA

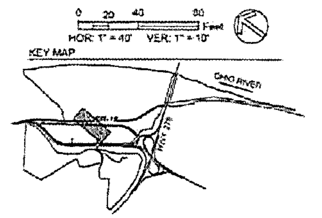
POORHOUSE RUN CULVERT

MVH	02/29/16	IFC, UPDATED GRADING AND DRAINAGE	2				
MVH	07/10/15	IFC, ADDED CCB BUILDING PAD	1				
MVH	09/18/14	ISSUED FOR CONSTRUCTION					
BY	DATE	DESCRIPTION	SYMBOL				
		REVISIONS					

SCALE HOR: 1" = 40' VER: 1" = 5'

DRAWING NUMBER C602 REV NO 2





NOTES

1. BOX CULVERT TYPE CLASSIFICATION:
   1. TYPE "A" - PER PENN DOT SPECIFICATION & STANDARD
   2. TYPE "B" - PER RAILROAD SPECIFICATION & STANDARD
   3. TYPE "C" - PER ASTM DESIGN STANDARD
2. REFER TO SHEETS C692-C694 FOR BOX CULVERT REINFORCING AND DETAILS.
3. REFER TO SHEETS C690-C691 FOR JUNCTION BOX REINFORCING DETAILS.
4. ALL WING WALLS WILL BE CAST-IN-PLACE PER DETAILS ON SHEETS C640 OR C641. ALL REBAR SHALL BE EPOXY-COATED REINFORCEMENT AND ALL CEMENT SHALL BE TYPE II SULFATE RESISTANT CEMENT. REFER TO SHEET C911
5. REFER TO SHEET C913 FOR BOX CULVERT INSTALLATION, BEDDING AND BACKFILL DETAIL.
6. ALL CULVERT, DRAINAGE STRUCTURES AND RELATED EARTHWORK CONSTRUCTION FROM POORHOUSE RUN CULVERT STATION 39+19.32 TO STATION 48+79.58 AND POOR FARM YARD CULVERT STATION 100+00.00 TO STATION 103+19.68 SHALL BE PERFORMED BY A HAZWOPER TRAINED CONTRACTOR UNDER THE SITE PREPARATION CONTRACT PACKAGE. PIPES AND STRUCTURES WITHIN THESE LIMITS SHALL BE SEALED PER SITE PREPARATION PACKAGE. POORHOUSE RUN JUNCTION BOX PR-6 & ALL CULVERTS & STRUCTURES UPSTREAM OF STATION 45+79.58 WILL BE INSTALLED BY CONTRACTOR. POOR FARM RUN JUNCTION BOX PF-10 & ALL CULVERTS & STRUCTURES UPSTREAM OF STATION 103+19.68 WILL BE INSTALLED BY CONTRACTOR.
7. NORTHINGS AND EASTINGS OF ALL MANHOLES, JUNCTION BOXES, INLETS AND WINGWALLS ARE GIVEN AT CONTROL POINTS LOCATED AT THE CENTER OF THE STRUCTURE. REFER TO STRUCTURAL DETAILS FOR EXACT LOCATION.
8. CONTRACTOR SHALL LIMIT DISTURBANCE OF EXIST. PILE TO THE WORK REQUIRED TO INSTALL THE SHEET PILES.

As Built
Trumbull
/ Mascaro
5/15/16

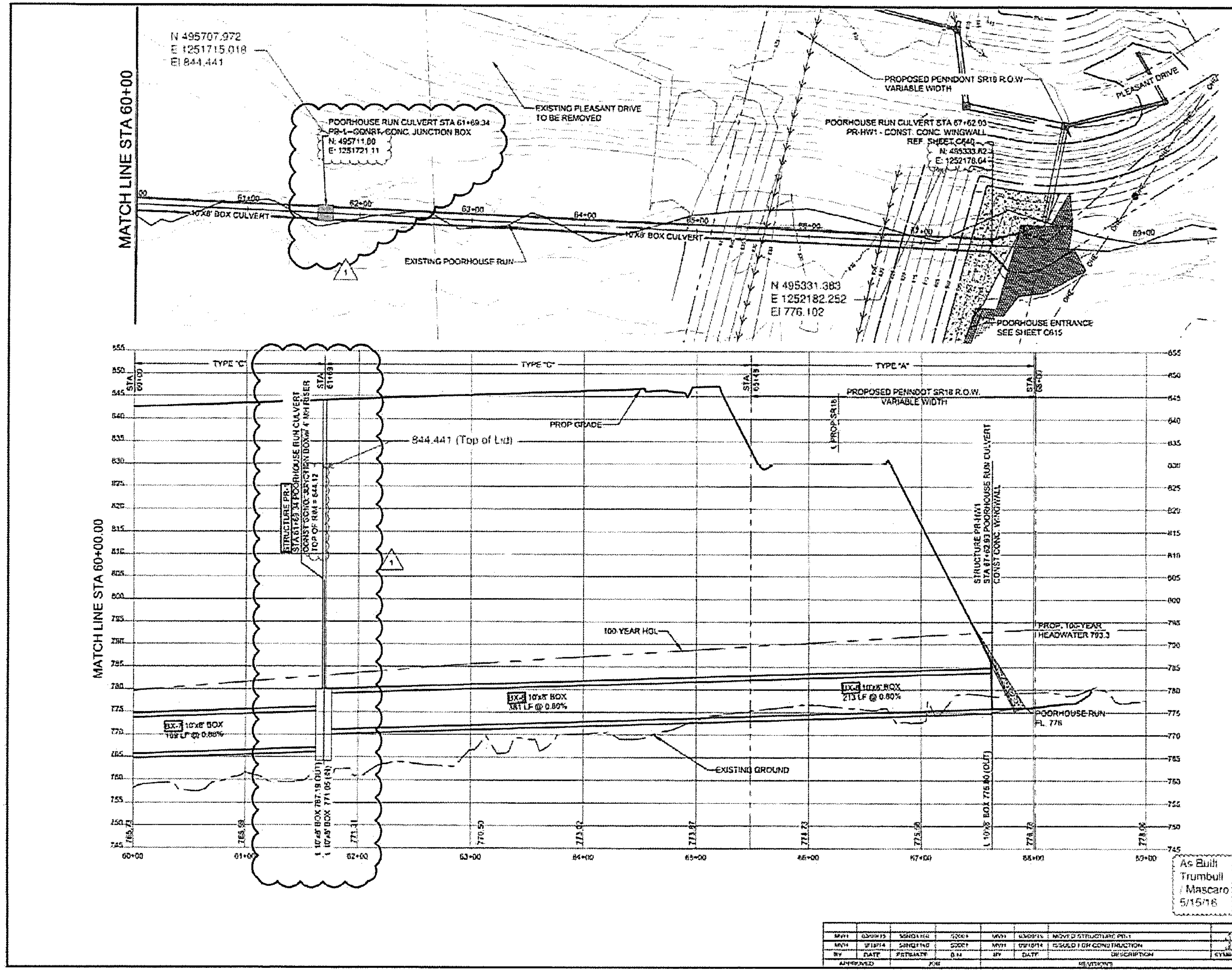
JACOBS
JACOBS ENGINEERING GROUP, INC.
5995 ROGERDALE ROAD
HOUSTON, TEXAS 77072
281.351.6000

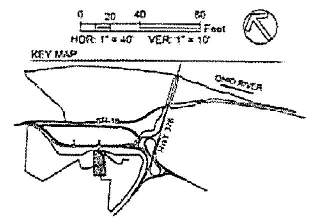
SHELL CHEMICALS
FRANKLIN PROJECT
MONACA, PENNSYLVANIA

POORHOUSE RUN
CULVERT

MVH	07/10/15			MVH	07/10/15	IFC RAIL YARD DRAINAGE	2
MVH	03/09/15			MVH	03/09/15	RAIL DRAINAGE, MOVED PR-3	1
MVH	09/10/14			MVH	09/10/14	ISSUED FOR CONSTRUCTION	
BY	DATE	ESTIMATE	B.U.	BY	DATE	DESCRIPTION	SYMBOL
APPROVED		JOB				REVISIONS	

INITIALS	DATE	SCALE: HOR: 1" = 40' VER: 1" = 5'		
DWN BY JAR	07-08-15	SHELL DOC NO.		
CHKD BY TDP	07-08-15	DWG NUMBER	DRAWING NUMBER	REV NO
APPVD BY RJA	07-08-15		C603	2
SUPERVISOR MVH	07-08-15			





NOTES

1. BOX CULVERT TYPE CLASSIFICATION.
   1. TYPE "A" - PER PENN DOT SPECIFICATION & STANDARD
   2. TYPE "B" - PER RAILROAD SPECIFICATION & STANDARD
   3. TYPE "C" - PER ASTM DESIGN STANDARD
2. REFER TO SHEETS C602-C694 FOR BOX CULVERT REINFORCING AND DETAILS.
3. REFER TO SHEETS C690-C691 FOR JUNCTION BOX REINFORCING DETAILS.
4. ALL WING WALLS WILL BE CAST-IN-PLACE PER DETAILS ON SHEETS C640 OR C641. ALL REBAR SHALL BE EPOXY-COATED REINFORCEMENT AND ALL CEMENT SHALL BE TYPE II SULFATE RESISTANT CEMENT. REFER TO SHEET C911.
5. REFER TO SHEET C913 FOR BOX CULVERT INSTALLATION, BEDDING AND BACKFILL DETAIL.
6. ALL CULVERT, DRAINAGE STRUCTURES AND RELATED EARTHWORK CONSTRUCTION FROM POORHOUSE RUN CULVERT STATION 39+19.32 TO STATION 48+79.98 AND POOR FARM YARD CULVERT STATION 100+00.00 TO STATION 103+19.68 SHALL BE PERFORMED BY A HAZWOPER TRAINED CONTRACTOR UNDER THE SITE PREPARATION CONTRACT PACKAGE. PIPES AND STRUCTURES WITHIN THESE LIMITS SHALL BE SEALED PER SITE PREPARATION PACKAGE. POORHOUSE RUN JUNCTION BOX PR-6 & ALL CULVERTS & STRUCTURES UPSTREAM OF STATION 48+79.98 WILL BE INSTALLED BY CONTRACTOR. POOR FARM RUN JUNCTION BOX PF-10 & ALL CULVERTS & STRUCTURES UPSTREAM OF STATION 103+19.68 WILL BE INSTALLED BY CONTRACTOR.
7. NORTHINGS AND EASTINGS OF ALL MANHOLES, JUNCTION BOXES, INLETS AND WINGWALLS ARE GIVEN AT CONTROL POINTS LOCATED AT THE CENTER OF THE STRUCTURE. REFER TO STRUCTURAL DETAILS FOR EXACT LOCATION.

As Built
Trumbull
/ Mascaro
5/15/16

JACOBS
JACOBS ENGINEERING GROUP, INC.
5995 ROGERDALE ROAD
HOUSTON, TEXAS 77072
281.351.8000

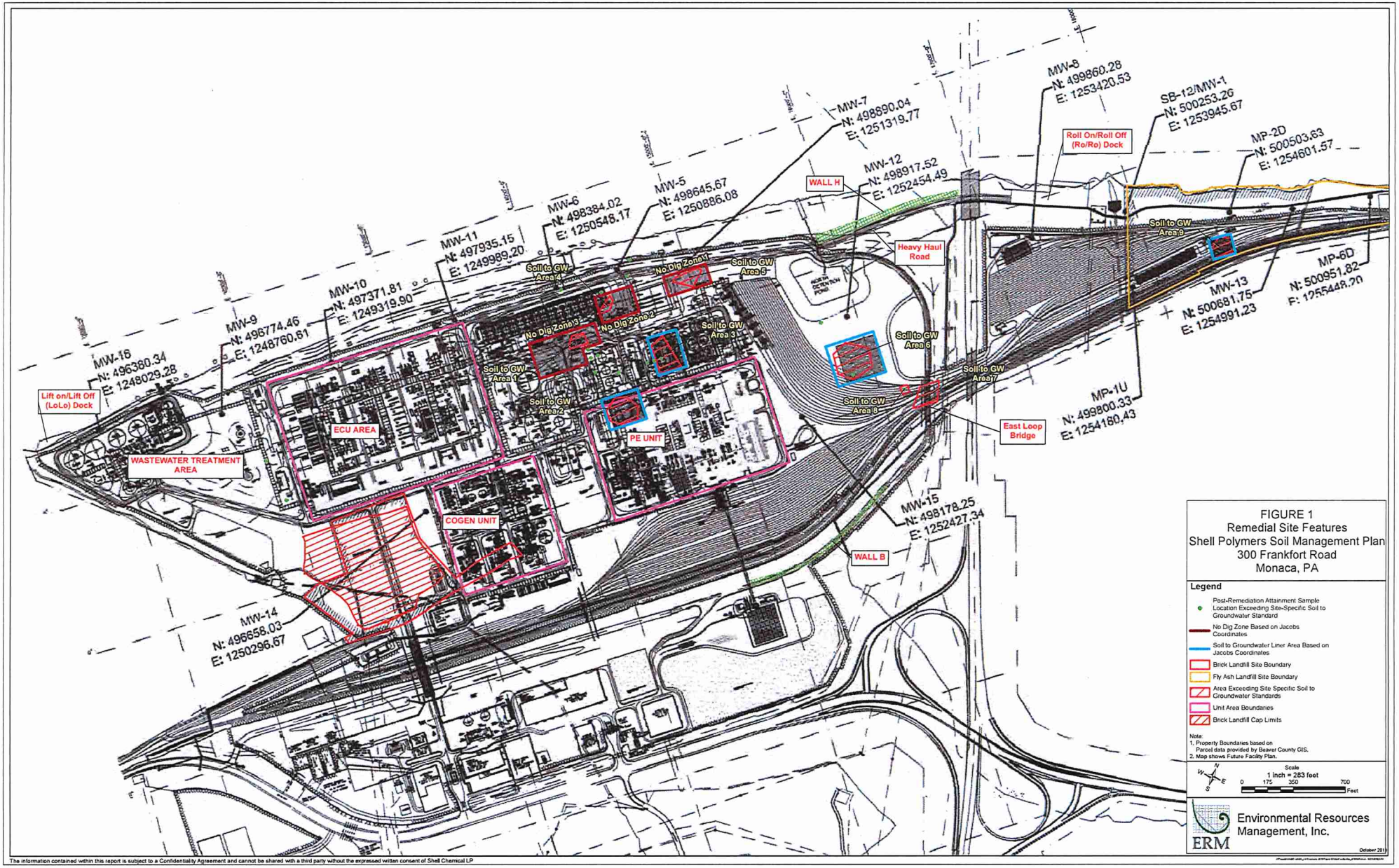
SHELL CHEMICALS
FRANKLIN PROJECT
MONACA, PENNSYLVANIA

POORHOUSE RUN
CULVERT

MVH	03/09/15	5SN0116	S2001	MVH	03/09/15	MOVED STRUCTURE PR-1	1
MVH	9/19/14	5SN0116	S2001	MVH	09/19/14	ISSUED FOR CONSTRUCTION	
BY	DATE	ESTIMATE	JOB	BY	DATE	DESCRIPTION	SYMBOL
APPROVED				REVISIONS			

INITIALS	DATE	SCALE: HOR: 1" = 40' VER: 1" = 5'
DWN BY JAK	03-10-15	SHELL DOC NO.
CHKD BY EGS	03-10-15	GRID NUMBER / DRAWING NUMBER / REV NO.
APRVD BY CR	03-10-15	
SUPERVISOR MVH	03-10-15	C604 / 1

Figures



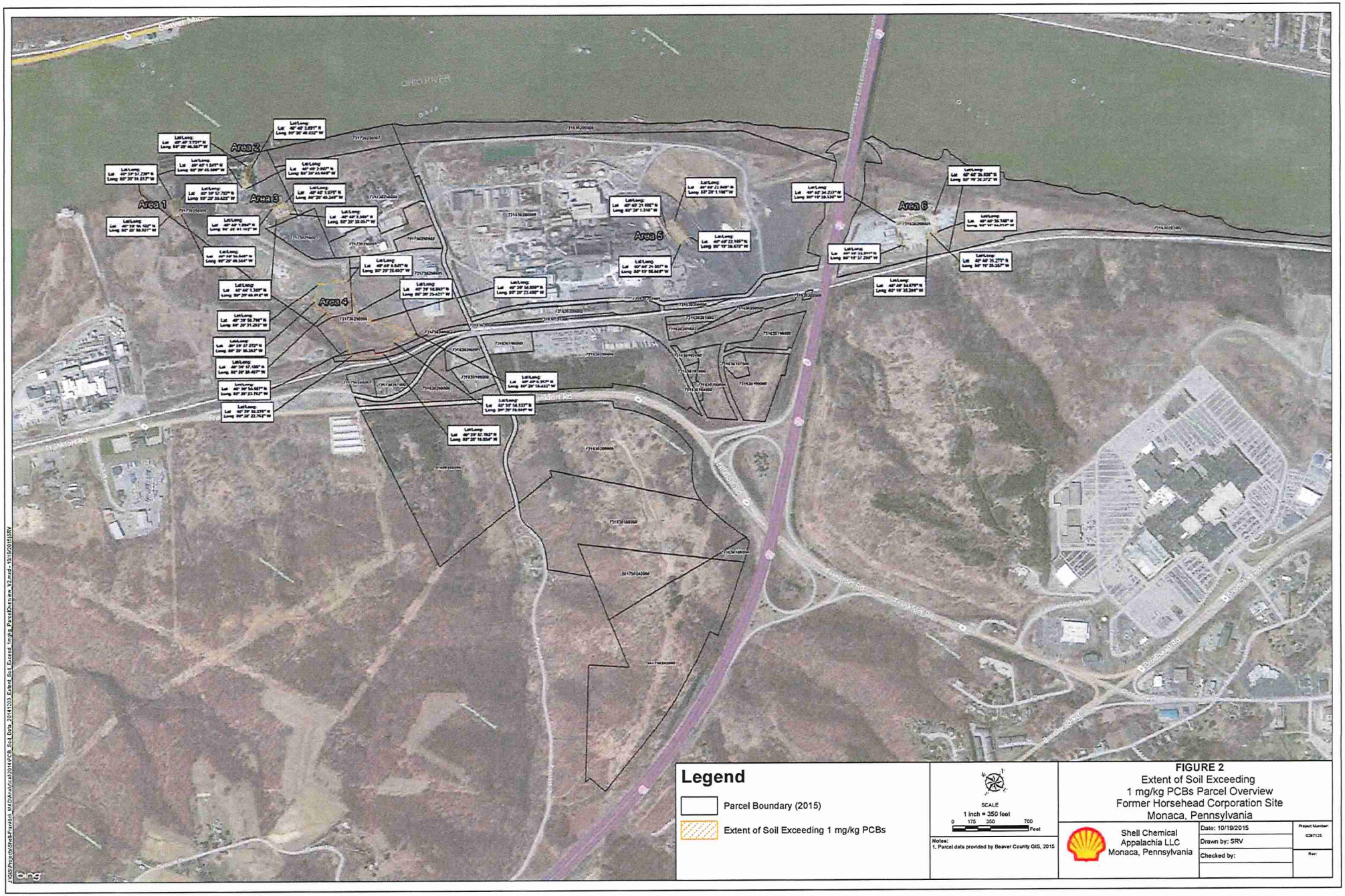

Area 1
Area 2
Area 3
Area 4
Area 5
Area 6
Legend
Parcel Boundary (2015)
Extent of Soil Exceeding 1 mg/kg PCBs
SCALE
1 inch = 350 feet
0 175 350 700
Feet
Notes:
1. Parcel data provided by Beaver County GIS, 2015
FIGURE 2
Extent of Soil Exceeding
1 mg/kg PCBs Parcel Overview
Former Horsehead Corporation Site
Monaca, Pennsylvania
Shell Chemical
Appalachia LLC
Monaca, Pennsylvania
Date: 10/19/2015
Drawn by: SRV
Checked by:
Project Number:
0287126
Rev:

Figure 3
Schematic of Impacted Soil Management During Excavation
Main Works Soil Management Plan
Project Franklin