pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING AND WETLANDS

CHAPTER 105 WATER OBSTRUCTIONS AND ENCROACHMENT GENERAL PERMIT REGISTRATION

SECTION A. APPLICANT INFORMATION

☐ **FERC Natural Gas Activity** **Docket Number** _____ **Type of Facility** _____

Has a Water Quality Certification (WQC) request been sent to DEP? ☐ **Yes** ☐ **No**

☐ **Activity Subject to FERC approval and/or Oil & Gas Exploration, Production, Storage or Transmission if the activity is regulated by FERC and provide the FERC docket number.**

Applicant's Name / Client	**DEP Client ID#** (if known)	**Employer ID#** (EIN)
Merrion Oil & Gas		850232430

Client Information - Please select Client Type / Code from drop down box under the correct entity shown to the right. (or may be written in) →	**Government**	**Non-Government**	**Individual**

Mailing Address	**City**	**State**	**ZIP + 4**
610 Reilly Ave	Farmington	NM	87401

Contact Person – Last Name	First	MI	Suffix	**Telephone**	**Email Address**
Davis	Ryan			(505) 215-3292	rdavis@merrion.bz

SECTION B. CONSULTANT INFORMATION (If applicable) ☐ N/A

Contact Person – Last Name	First	MI	Suffix	**Consultants Title**	**Consulting Firm**
Antolick	Tessa	M	P.E.	Senior Engineer	ARM Group Inc.

Mailing Address	**City**	**State**	**ZIP + 4**
2548 Park Center Boulevard	State College	PA	16801

Telephone	**Fax**	**Email**	**Employer ID# (EIN)**
(814) 272-0455	(814) 272-0467	tantolick@armgroup.net	25-1807594

SECTION C. PROJECT INFORMATION

Project / Site Name	**DEP Site ID# (if known or leave blank)**
ET - Braddock Well Pad & Pipelines	

Client Relationship - Please select Site-to-Client Relationship / Code from drop down box to the right. (or may be written in) →	Double-click on shaded area below to select correct Site-to-Client Relationship / Code ↓ **LESSE Lessee**

County	**Municipality** ☐ City ☒ Borough ☒ Township	**Note: Municipal & County Notification is Required**
Allegheny	North Braddock, North Versailles	

Site Location / Address	**City**	**State**	**ZIP + 4**
152 11th St.	Braddock	PA	15104

Collection Method: ☒ EMAP ☐ HGIS ☐ GISDR* ☐ ITPMP ☐ GPS ☐ WAAS ☐ LORAN

Check the horizontal reference datum (or projection datum) employed in the collection method.

EMAP and HGIS (PNDI) have known datum and do not require checking here. ☐ NAD27 ☐ NAD83 ☐ WGS84 (GEO84) LAT.: 40.393331 LONG.: -79.845723

NOTE: A Submerged Lands License Agreement (SLLA) with an annual fee, if applicable, may also be required for your project. You will be notified if an SLLA is required.

The Aquatic Resources Impact Table (SECTION E. PROPOSED IMPACTS) **must be completed or equivalent submitted for this registration to be complete.**

SECTION D. REGISTRATION CHECKLIST AND REQUIREMENTS

Please place an "X" next to each item (1-9) to ensure it is completed and/or provided.

Unless otherwise specified, all items are ***required*** to ensure a complete Registration package.

Provide ONE (1) ORIGINAL and ONE (1) COPY of the Registration package

Please provide a copy of the Registration form to the Municipality & County in which the work will be performed. Proof of receipt is not required to be provided to DEP.

1. REGISTERING A GENERAL PERMIT (GP) check all that apply

Federal, State, county or municipal agencies or municipal authorities: ☐ **EXEMPT from fees**

☐ GP-1	Fish Habitat Enhancement Structures ..... Per Project	$ 50	= $ _____
☐ GP-2	Small Docks and Boat Launching Ramps ..... Per Dock / Ramp _____ (#) x	$ 175	= $ _____
☐ GP-3	Bank Rehabilitation, Bank Protection and Gravel Bar Removal ..... Per Project _____ (#) x	$ 250	= $ _____
☐ GP-4	Intake and Outfall Structures ..... Per Structure _____ (#) x	$ 200	= $ _____
☒ GP-5	Utility Line Stream Crossings ..... Per Individual Utility 2 (#) x 1 (#) x	$ 250	= $ 500
☐ GP-6	Agricultural Crossings and Ramps ..... Per Crossing / Ramp _____ (#) x	$ 50	= $ _____
☐ GP-7	Minor Road Crossings[2] ..... Per Crossing _____ (#) x	$ 350	= $ _____
☐ GP-8	Temporary Road Crossings[2] ..... Per Crossing _____ (#) x	$ 175	= $ _____
☐ GP-9	Agricultural Activities ..... Per Project	$ 50	= $ _____
☐ GP-10	Abandoned Mine Reclamation ..... Per Project	$ 500	= $ _____
☐ GP-11	Maintenance, Testing, Repair, Rehabilitation, or Replacement of Water Obstructions and Encroachments[1]	$ 750	+
	☐ Temporary Disturbance ($400/0.1ac) ..... _____ acres x $4,000 =	$ _____	+
	☐ Permanent Disturbance ($800/0.1ac) ..... _____ acres x $8,000 =	$ _____	= $ _____
☐ GP-15	Private Residential Construction in Wetlands[1]	$ 750	+
	☐ Temporary Disturbance ($400/0.1ac) ..... _____ acres x $4,000 =	$ _____	+
	☐ Permanent Disturbance ($800/0.1ac) ..... _____ acres x $8,000 =	$ _____	= $ _____

GP(s) FEE subtotal (b) $ 500

	Applicant Entry	DEP Use Only
2. Location Map (USGS quad map) with project site marked:	☒	☐
3. Color Photographs with dates, locations, and descriptions: ☐ GP-3 ☐ GP-11 ☒ **N/A**	☐	☐
4. Project Description: (Example: Linear pipeline project using multiple GP-5's and GP-8's; One GP-7 for an access road to my property) Two linear stream crossings (GP-5), both crossing an existing stream enclosure. One proposed above ground gas line. One proposed above ground water line.	☒	☐
5. Site Specific and/or Standard Drawings are **(required for all)** project's GP activities. For Activities that qualify for GP-7 or GP-11 Plans, specifications, and reports for bridges and culverts across a stream which are to be used by the general public such as an access to an industrial, commercial or residential development, etc., shall be prepared by a registered professional engineer and shall be affixed with their seal and certification which shall read as follows on the drawings: If the project includes a bridge or culvert replacement or the proposed work will change the waterway opening, please complete and provide the Bridge and/or Culvert Replacement Projects or Projects That Change the Waterway Opening (3150-PM-BWEW0552B) worksheet. If the project consists of similar work (replacement or change in waterway opening) on more than one structure, provide the data requested for each structure included in this Registration package. *"I (name) do hereby certify pursuant to the penalties of 18 Pa. C.S.A. Sec. 4904 to the best of my knowledge, information and belief, that the information contained in the accompanying plans, specifications, and reports has been prepared in accordance with accepted engineering practice, is true and correct, and is in conformance with Chapter 105 of the rules and regulations of the Department of Environmental Protection."*	☒	☐
6. Proposed Project Purpose depicting the site of the projects GP activities and impacts. Briefly discuss the need for the authorization.	☒	☐
7. Erosion & Sediment Control Plan (E&S Plan) (Required for all GP's but specifically required with submission with a registration of GP-11 or GP's for oil and gas related activities submitted to DEP.)	☒	☐
8. Pennsylvania Natural Diversity Inventory (PNDI): PNDI Search Receipt and clearance letters, if available. See additional requirements for submission with Avoidance Measures and/or Potential Impacts.	☒	☐
9. Activities which impact wetlands: (For State Regulated Impacts) **Please place an "X" next to the appropriate box indicating the information provided:**		
➢ N/A because no wetland impacts are proposed or no compensatory mitigation is necessary.	☒	☐
➢ A wetland delineation with complete data sheets in accordance with the 1987 Corps of Engineers Wetland Delineation Manual AND the appropriate Regional Supplements to the Corps of Engineers Wetland Delineation Manual for use in Pennsylvania.	☐	☐
➢ If direct or indirect wetland impacts are greater than 0.05 acre, a compensatory mitigation plan in accordance with the Department's Replacement criteria which provides compensation for both affected acreage, and functions at a minimum of one to one ratio.	☐	☐
➢ **If compensatory mitigation onsite is determined not feasible:** A check, number _____, in the amount of $ _____ payable to the National Fish and Wildlife Foundation, N.A. 1237, as compensatory mitigation for _____ acres of impact in wetlands, in accordance with the Pennsylvania Wetland Replacement Project.	☐	☐
(Additional Mitigation May Be Required by U.S. Army Corps)	☐	☐
NOTE: If the Pennsylvania Wetland Replacement Fund is proposed to be used as compensatory mitigation for waters of the Commonwealth the U.S. Army Corps of Engineers may also require additional mitigation if the proposed activity impacts waters of the United States.		

3150-PM-BWEW0557 7/2016

Aquatic Resource Impact Table

Applicant's Name / Client: Merrion Oil Gas

Project / Site Name: Merrion Oil & Gas ET Braddock 1H

Date: ~~5/31/2018;~~ Revised March 2019

DEP / Corps use only			Project Information								Corps / 404					PADEP / 105		
PADEP Permit Number *leave blank*	**Single and Complete Project** *leave blank*	**Crossing Number** *leave blank*	**Structure / Activity** unique identifier	**Aquatic Resource** being impacted	**Aquatic Resource TYPE**	**Latitude** *dd nad83*	**Longitude** *dd nad83*	**Work Proposed / Impact Type**	**Waters Name**	**PA Code Chapter 93 Designation**	**Corps Impact TYPE** *temp / perm*	**Stream Impact WIDTH** linear feet	**Stream Impact LENGTH** linear feet	**Stream Impact AREA** square feet	**Wetland Impact AREA** square feet	**DEP Impact TYPE** *temp / perm*	**Floodway Impact AREA** square feet	**Wetland Impact AREA** square feet
			SE 1 (water)	Stream	Perennial	40.393734	-79.84533	Aerial	TRIB 64495 to Turtle Creek	WWF						Perm	139.5	N/A
			SE 1 (water)	Stream	Floodway	40.393734	-79.84533	Aerial	TRIB 64495 to Turtle Creek	WWF						Temp	3987.5	N/A
			SE 1 (gas)	Stream	Perennial	40.392799	-79.848094	Excavation	TRIB 64495 to Turtle Creek	WWF						Perm	101.0	N/A
			SE 1 (gas)	Stream	Floodway	40.392799	-79.848094	Excavation	TRIB 64495 to Turtle Creek	WWF						Temp	2929.0	N/A

SECTION F. CERTIFICATION

I certify under penalty of law that the information provided in this permit registration is true and correct to the best of my knowledge and information and that I possess the authority to undertake the proposed action. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (If any of the information and/or plans is found to be in error, falsified, and/or incomplete, this authorization/verification may be subject to modification, suspension, or revocation in accordance with applicable regulations.) I further certify that this project complies with all the conditions of the general permit.

T. Greg Merrion
Signature of Applicant / Owner

5-29-18
Date

T. Greg Merrion
Typed / Printed Name

President
Typed / Printed Title

This General Permit shall not be effective until the owner has had their E&S Plan reviewed by the appropriate Regional Office or District, and, where required, obtained an SLLA from DEP.

THIS ACKNOWLEDGED COPY OF THIS GENERAL PERMIT REGISTRATION PACKAGE AND THE E&S PLAN MUST BE AVAILABLE AT THE PROJECT SITE DURING CONSTRUCTION.

SECTION G. DECISION / DISPOSITION – COMPLETED BY DEP

Decision Review:

_____ GP _____
DEP / District Reviewer Signature

_____ GP _____
Reviewer's Typed / Printed Name

NOTE: See Aquatic Resource Impact Table for any additional authorizations.

Disposition Status			Comments
☐ **ACKNOWLEDGED**	Date _____		
SLLA Required	☐ Yes Attached	☐ No	
☐ **INCOMPLETE / DEFICIENCY**	Date _____		
☐ **EXTENSION REQUEST**	Date _____		
☐ **WITHDRAWN**	Date _____		

NOTE: If the GP registration information is incomplete a copy of this registration form and requested additional information will be sent to the applicant. A copy of the returned registration form and additional information must be re-submitted within 60 calendar days unless extended by the extension date listed above.

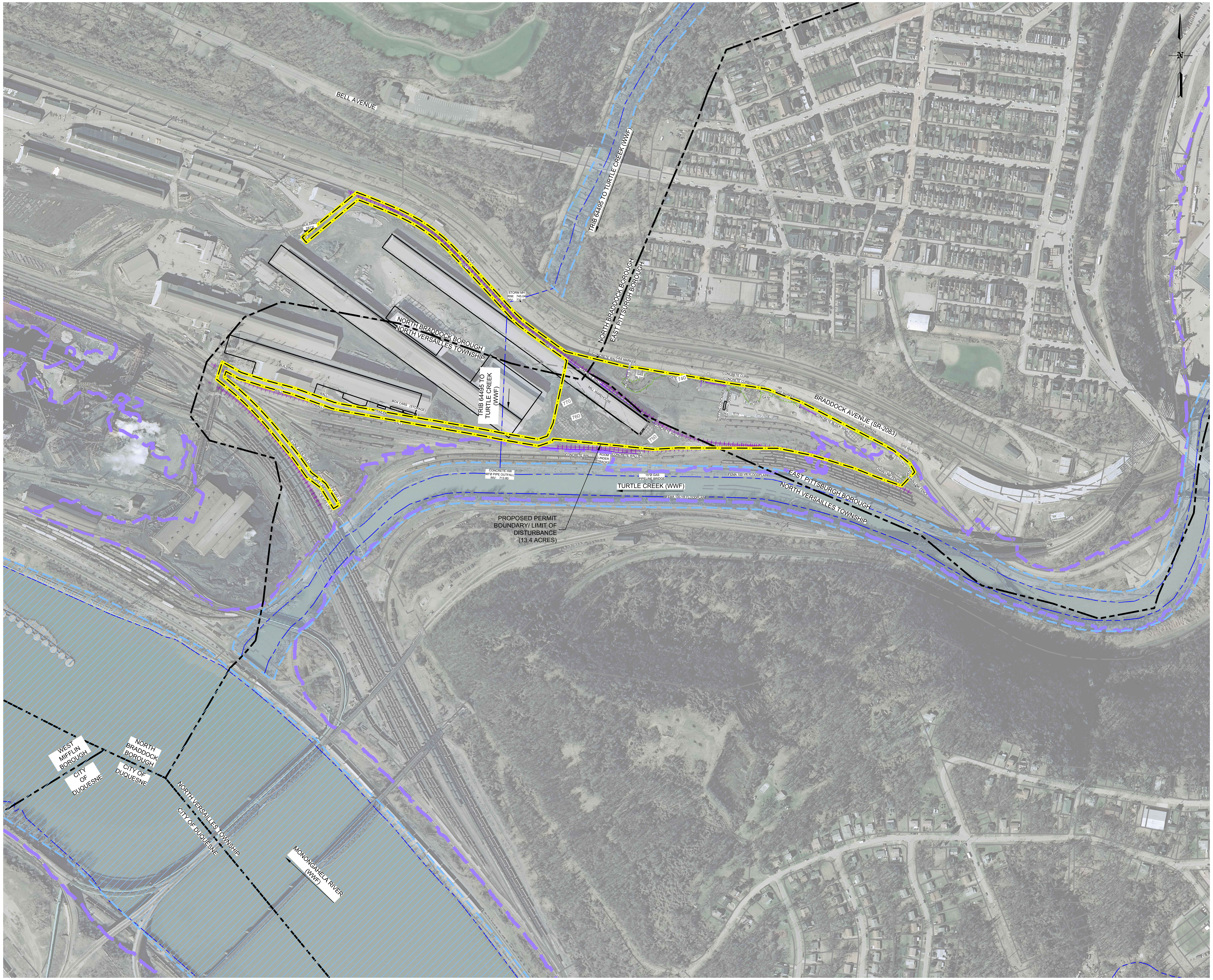
☐ **FEDERAL AUTHORIZATION**

- ☐ Non-reporting PASPGP verification / authorization attached.
- ☐ Reporting – A copy of this General Permit registration package has been sent to the U.S. Army Corps of Engineers. Separate federal authorization may be required

NOTE: Please be advised that if the reporting box is checked you do not have Federal authorization for this project and such authorization may be required prior to starting your project. In accordance with Section 404 of the Clean Water Act, a Department of the Army authorization is required for the discharge of dredged and/or fill material into waters of the United States, including jurisdictional wetlands. Section 10 of the Rivers and Harbors Act also requires Department of the Army authorization for any work in, over, or under a navigable water of the United States. In accordance with procedures established with the U.S. Army Corps of Engineers, you will be contacted directly by the Corps regarding Federal Authorization.

Sheet C701 – Existing Conditions Overlay Map

A R M G r o u p I n c .



NOTES:

1. THE BASE MAP HAS BEEN CREATED USING SURVEY DATA (WITHIN LIMIT OF DISTURBANCE) PROVIDED BY TRANT CORPORATION, DATED 05/31/2018, SUPPLEMENTED BY AERIAL PHOTOGRAPHY OF PAMAP TILES 40001380PAS PROVIDED BY TRANT CORPORATION. SITE TOPOGRAPHY IS SUBJECT TO CHANGE DUE TO ACTIVE STOCKPILE BY US STEEL.
2. AERIAL IMAGE ON SHEET C701 WAS PROVIDED BY AERIAL PHOTOGRAPHY OF PAMAP TILES 40001380PAS DATED 2010.
3. PROPERTY LINES INFORMATION OF ALLEGHENY COUNTY ARE PROVIDED BY TRANT CORPORATION. THIS BASEMAP IS NOT THE RESULT OF AN ACTUAL FIELD SURVEY OF PROPERTIES SHOWN AND SHOULD NOT BE USED AS SUCH.
4. THIS PLAN IS IN THE PENNSYLVANIA STATE PLANE SOUTH, NORTH AMERICAN DATUM 1983 (NAD 83) COORDINATE SYSTEM.
5. SLOPE AREAS 3:1 OR GREATER BROUGHT TO FINISH GRADE ARE TO BE STABILIZED WITH ROCK OR SEEDED WITH MULCH APPLIED TO SLOPES AS SPECIFIED ON DETAIL SHEETS.
6. EXISTING RAILROAD TRACKS WITHIN WELL PAD PROJECT AREA WILL BE REMOVED.
7. THE TEMPORARY WATER STORAGE TANK DIMENSIONS AND LAYOUT ARE DISPLAYED FOR ILLUSTRATIVE PURPOSES ONLY. THE FINAL TANK DIMENSIONS AND LAYOUT WILL BE DETERMINED PRIOR TO CONSTRUCTION. THE OPEN-TOP TANKS ARE NOT ACCOUNTED FOR IN THE PCSM CALCULATIONS. THE ENTIRE TANK AREA IS MODELED AS A 'GRAVEL' COVER TYPE TO ACCOUNT FOR RUNOFF BEFORE THE TANKS ARE ERECTED.

LEGEND

NOTE: LEGEND IS TYPICAL, NOT ALL OBJECTS IN LEGEND APPEAR IN PLAN.

Symbol	Description
1550	EXISTING CONTOURS
	FEMA FLOODPLAIN
	50' FLOODWAY
	FEMA FLOODWAY
	EXISTING MAPPED WATERCOURSE
	EXISTING STRUCTURE
	EXISTING VEGETATION
	EXISTING PROPERTY LINE
	EXISTING MUNICIPAL BOUNDARIES
x	EXISTING FENCE
OE	EXISTING OVERHEAD ELECTRIC LINE
	EXISTING ELECTRIC POLE
G	EXISTING GAS LINE
W	EXISTING WATER LINE
	EXISTING CULVERT
	EXISTING WALL
	EXISTING RAILLINE
	EXISTING SLAG PILE
WeB	EXISTING SOIL BOUNDARY AND DESCRIPTOR
1490	PROPOSED CONTOURS
	PROPOSED LIMIT OF DISTUBANCE
>>	PROPOSED CHANNEL
	PROPOSED WATER FEATURES
	PROPOSED WELL PAD
	PROPOSED TEMPORARY TANK
W	PROPOSED WATERLINE
G	PROPOSED GASLINE
	PROPOSED SLOPE STABILIZATION
	PROPOSED ROCK CONSTRUCTION ENTRANCE WITH WASH RACK
	PROPOSED ACCESS ROAD
12	PROPOSED 12" FILTER SOCK
24	PROPOSED 24" FILTER SOCK
	PROPOSED CULVERT
DIV	PROPOSED DIVERSION BERM
	PROPOSED GRAVEL
	PROPOSED INLET

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TESSA MICHELE ANTOLICK
ENGINEER
No. PE077667

This Drawing shall not be used for tender or construction unless sealed.

I do hereby certify to the best of my knowledge, information and belief, that the Erosion and Sediment Control and Site Restoration Plan and Post Construction BMPs are true and correct, represent actual field conditions and are in accordance with the 25 Pa. Code Chapters 78 and 102 of the Department's rules and regulations. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

TESSA MICHELE ANTOLICK, PE - 077667

ARM Group Inc.
Engineers and Scientists
www.armgroup.net

No.	Revision	Date	By
1	REVISED PER PADEP COMMENTS	10/22/2018	ARM
0	PADEP SUBMISSION	05/31/2018	TRANT

designed	KGJ	scale	1" = 200'
checked	MDR	date	10/22/2018
drawn	QZ	project no.	180539

graphic scale: 0, 200, 400, 600 SCALE IN FEET

drawing title: EXISTING CONDITIONS OVERLAY MAP EROSION AND SEDIMENT CONTROL PLAN

EAST PITTSBURGH BOROUGH, NORTH BRADDOCK BOROUGH, NORTH VERSAILLES TOWNSHIP, ALLEGHENY COUNTY, PENNSYLVANIA

project title: ET - BRADDOCK WELL PAD
MERRION OIL & GAS

Sheet C701

P:\Merrion Oil & Gas\180539-1-1-ET Braddock 1H\Dwg\Production\E&S (24x36)\180539-ES-C701&C702.dwg Plotted: October 24, 2018

Stream Photograph

Photograph 1 – View of existing concrete headwall of 48-inch diameter culvert conveying Trib 64495 to Turtle Creek. The enclosed stream culvert is buried nearly 20 feet below existing ground surface. View is facing north.

Hydrologic and Hydraulic Analysis

A R M G r o u p I n c .

ARM GROUP INC.
MEMO

To: Ryan Davis, Operations Manager, Merrion Oil & Gas

From: Brian Bonner, P.E., Project Manager

Date: October 23, 2018

Re: Proposed ET Braddock Well Pad and Pipelines - Summary of Hydrologic and Hydraulic Analysis

ARM Group Inc. (ARM) has prepared this memo for Merrion Oil and Gas, (Merrion) to summarize the findings from a hydrologic and hydraulic (H&H) evaluation of the referenced project site in East Pittsburgh Borough, North Braddock Borough and North Versailles Township, Allegheny County, Pennsylvania. The purpose of this work was to determine and quantify the effect, if any, that the installation of a buried gas pipeline and an aboveground water pipeline would have on the 100-year flood elevation of an existing stream enclosure that crosses beneath the project site (Figure 1). The scope of this project included: (1) a review of available published H&H information relevant to the site; (2) a desktop hydrologic study to determine the 100-year flood event discharge; (3) the development of a hydraulic pipeline profile using HydraFlow Extensions within AutoCAD Civil 3D; (4) analysis of the 100-year flood event; and (5) compilation of this summary report.

BACKGROUND

Based upon the information received from Merrion, ARM understands that two proposed pipelines will cross above the existing stream enclosure, which carries Tributary 64495 to Turtle Creek under the existing US Steel mill and rail yard. A proposed freshwater pipeline will be installed aboveground along an abandoned rail grade. The proposed natural gas pipeline will be buried approximately 4 feet below the existing ground surface. The stream enclosure inverts are at an average depth of 18 to 20 feet below the existing ground surface resulting in a minimum separation of greater than 10 feet between the stream culvert and the pipelines.

AVAILABLE HYDROLOGIC INFORMATION

ARM utilized the online StreamStats tool for Pennsylvania, which is comprised of various GIS data layers and integrated regression equations for estimating the various recurrence intervals, or flood events. For the purposes of this exercise, ARM only reviewed the 100-year recurrence interval.

The existing stream enclosure is a 48-inch diameter culvert which encloses Tributary 64495 to Turtle Creek. This tributary ultimately discharges to Turtle Creek at approximately N40.392222° W79.848056°. Using the StreamStats application, the drainage area to this coordinate (e.g. the upstream invert of the stream enclosure) was determined to be approximately 0.44 square miles (281 acres). The StreamStats calculated peak discharge for to 100-year recurrence interval, as presented in Appendix A, was found to be 210 cubic feet per second (cfs).

HYDRAULIC MODELLING

The hydraulic model was created utilizing the results of the desktop topographic evaluation of the drainage area, a review of aerial imagery, as well as relevant information from the available FEMA Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) panels (Figure 2). Manning's roughness coefficients were derived from a review of the available information in conjunction with typical published values [e.g., as available in Hydrology and Floodplain Analysis (2008) and other standard textbooks].

A detailed FEMA study was completed for the Monongahela River and extends upstream into Turtle Creek. Therefore, existing regulatory cross sections are available in the immediate vicinity of the site. On the published FIRM Panel 42003C0388H, an established base flood elevation (BFE) of 740 feet occurs just upstream from where the unnamed tributary discharges from the enclosure. The enclosure discharge point is situated within the FEMA Zone AE floodplain of Turtle Creek. The known BFE was used to determine culvert flow characteristics during a 100-year return period.

The known invert elevations of the culvert and existing ground surface grade elevations were used with the HydraFlow Express software (within AutoCAD Civil 3D 2016) to calculate the 100-year water surface elevation (WSE) for the stream enclosure. The model results (Appendix B) also provide a hydraulic grade line (HGL) for the culvert based upon the Tailwater Depth (obtained from the FEMA Flood Insurance Rate Map mentioned above), which was determined to be 740 feet.

CONCLUSION

Under the 100-year flood condition per the HydraFlow results, this stream enclosure will operate under outlet control conditions, but will not overtop. As such, the proposed pipelines crossing the stream will not influence the 100-year water surface elevation or impact the inlets or outlets of the existing culvert.

LIMITATIONS

All conclusions and recommendations presented in this report are based on the appropriateness of available regression equations and historic data by others, the assumption that the topographic and geometric conditions do not deviate appreciably from those presented herein, and other factors presented in this report. In the event that the proposed construction and/or anticipated geometry change with respect to those currently proposed or assumed, if significant development or other activities that can increase stormwater runoff are known to occur in upstream locations, or in the event that conditions encountered during construction are different from those described herein, ARM should be notified so supplementary recommendations can be provided, if warranted.

CERTIFICATION

I, Brian C. Bonner, do hereby certify pursuant to the penalties of 18 Pa.C.S.A. Sec. 4904 to the best of my knowledge, information and belief, that the information contained in the accompanying plans, specifications and reports has been prepared in accordance with accepted engineering practice, is true and correct, and is in conformance with Chapter 105 of the rules and regulations of the Department of Environmental Protection.'' §105.315, §105.161 c(3) §105.13(j)

CLOSING

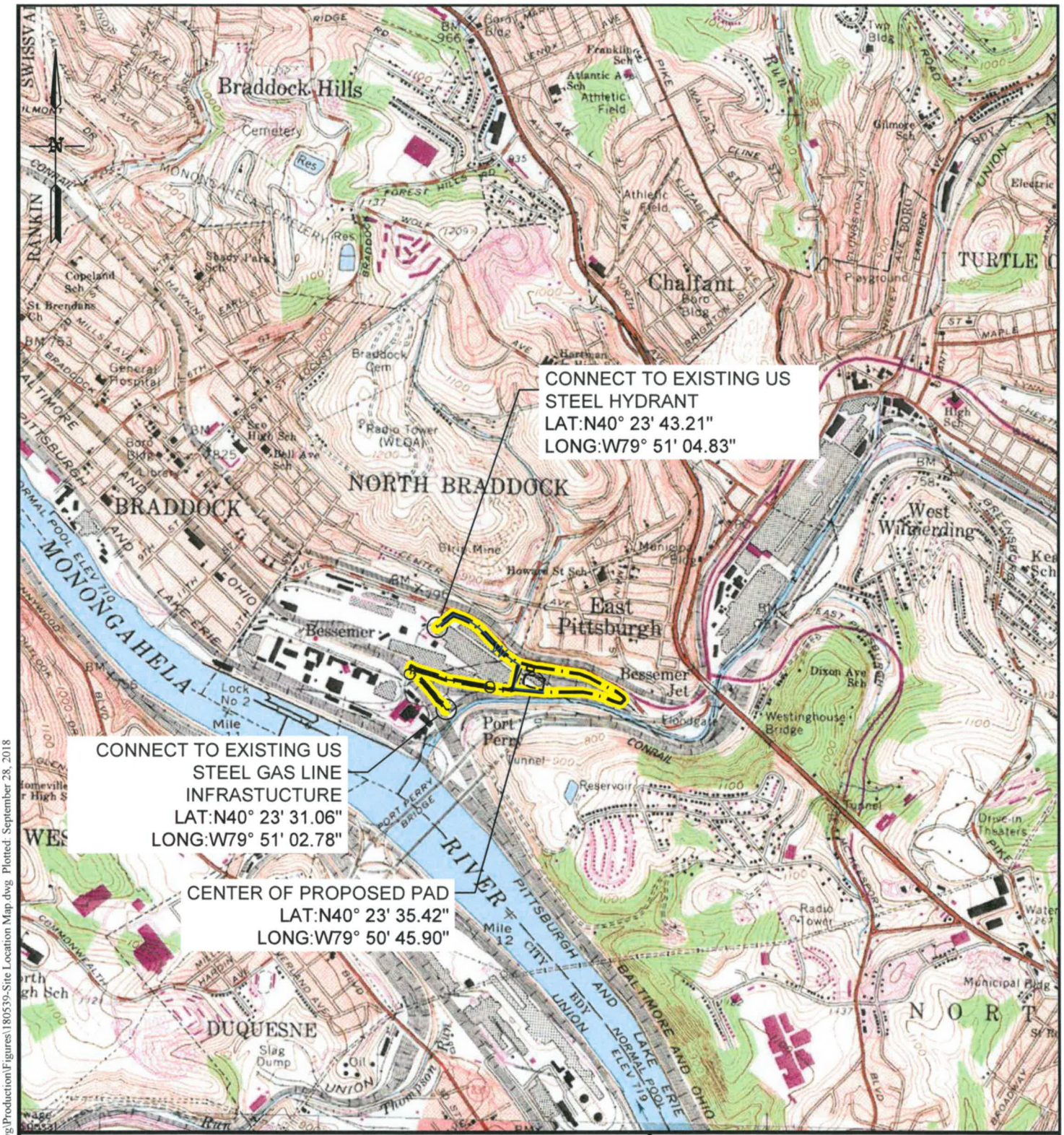
Please contact the undersigned at 814-272-0455 if you have any questions or comments regarding this summary. We appreciate your time and look forward to an efficient review.

Sincerely,
ARM Group Inc.

Brian Bonner, P.E.
Project Manager

Attachments

Figures



Base map from the following USGS 7½ minute quadrangles: Braddock in 1960 photorevised 1979.

LEGEND

W — PROPOSED WATERLINE	PROPOSED LOD
G — PROPOSED GASLINE	PROPOSED WELL PAD

0 2000 4000 6000

SCALE IN FEET

SITE LOCATION MAP

SOIL EROSION AND SEDIMENT POLLUTION CONTROL PLAN
MERRION OIL & GAS ET BRADDOCK
EAST PITTSBURGH BOROUGH, NORTH BRADDOCK BOROUGH,
NORTH VERSAILLES TOWNSHIP,
ALLEGHENY COUNTY, PENNSYLVANIA

09/28/2018	Scale: 1" = 2000'	180539

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Figure 1

P:\Merrion Oil & Gas\180539-1-1-ET Braddock 1H\Drwg\Production\Figures\180539-Site Location Map.dwg Plotted: September 28, 2018

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane Pennsylvania south zone (FIPSZONE 3702). The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the Allegheny County Geographic Information Systems Group. This information was photogrammetrically compiled at a scale of 1:2,400 from aerial photography dated 2004.

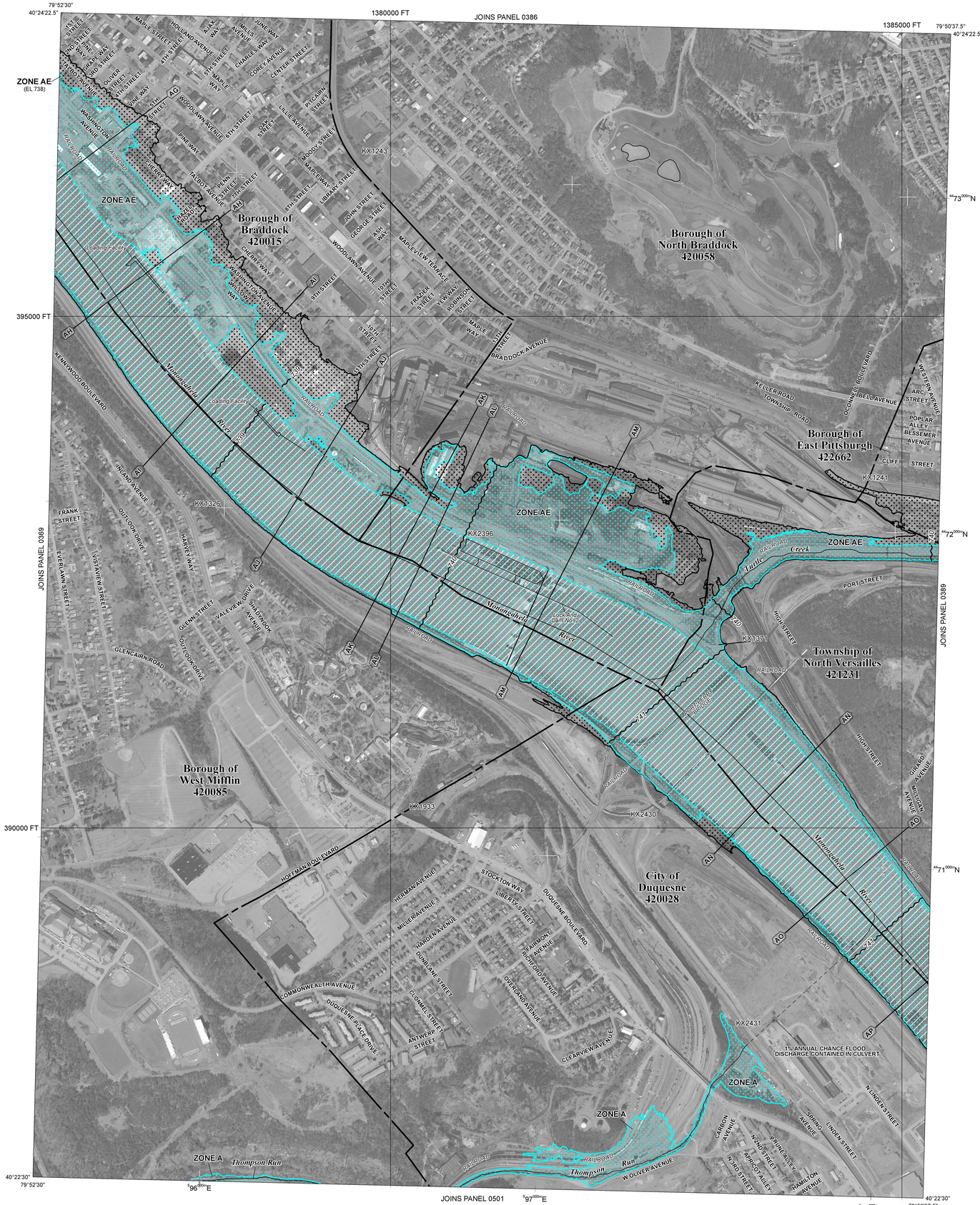
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the Map Service Center (MSC) website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have questions about this map, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange (FMIX) at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4276000mN — 1000-meter Universal Transverse Mercator grid values, zone 17N
- 600000 FT — 5000-foot grid values: Pennsylvania State Plane coordinate system, South zone (FIPSZONE 3702), Lambert Conformal Conic projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
October 4, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

See Notice To Users page in FIS Report

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0388H

FIRM

FLOOD INSURANCE RATE MAP

ALLEGHENY COUNTY, PENNSYLVANIA
(ALL JURISDICTIONS)

PANEL 388 OF 558

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BRADDOCK, BOROUGH OF	420015	0388	H
DUQUESNE, CITY OF	420028	0388	H
EAST PITTSBURGH, BOROUGH OF	422662	0388	H
NORTH BRADDOCK, BOROUGH OF	420058	0388	H
NORTH VERSAILLES, TOWNSHIP OF	421231	0388	H
WEST MIFFLIN, BOROUGH OF	420085	0388	H

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
42003C0388H

MAP REVISED
SEPTEMBER 26, 2014

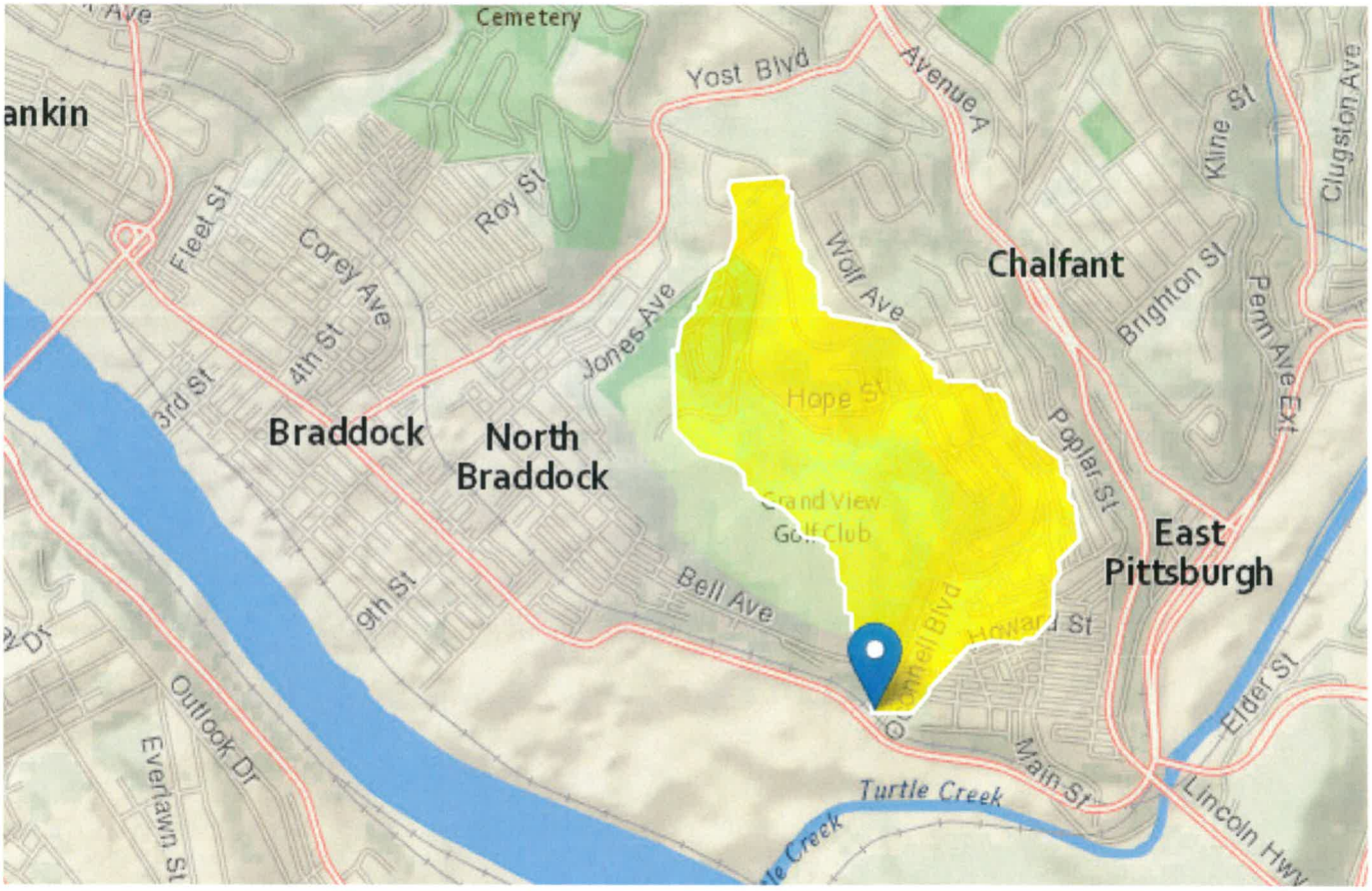
Federal Emergency Management Agency

APPENDIX A

StreamStats Output

StreamStats Report

Region ID: PA
Workspace ID: PA20181011171414822000
Clicked Point (Latitude, Longitude): 40.39508, -79.84784
Time: 2018-10-11 13:14:42 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.44	square miles
ELEV	Mean Basin Elevation	1059.2	feet
CARBON	Percentage of area of carbonate rock	0	percent
PRECIP	Mean Annual Precipitation	37	inches

Parameter Code	Parameter Description	Value	Unit
FOREST	Percentage of area covered by forest	45	percent
URBAN	Percentage of basin with urban development	51	percent
BSLOPD	Mean basin slope measured in degrees	9.1	degrees
BSLOPDRAW	Unadjusted basin slope, in degrees	9.32	degrees
CENTROXA83	X coordinate of the centroid, in NAD_1983_Albers, meters	-156841.6	meters
CENTROYA83	Basin centroid horizontal (y) location in NAD 1983 Albers	157375.9	meters
DRN	Drainage quality index from STATSGO	3.4	dimensionless
GLACIATED	Percentage of basin area that was historically covered by glaciers	0	percent
IMPNLCD01	Percentage of impervious area determined from NLCD 2001 impervious dataset	29	percent
LC01DEV	Percentage of land-use from NLCD 2001 classes 21-24	96	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	96.3	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	28.6	percent
LONG_OUT	Longitude of Basin Outlet	-79.84785	degrees
MAXTEMP	Mean annual maximum air temperature over basin area from PRISM 1971-2000 800-m grid	60	degrees F
OUTLETXA83	X coordinate of the outlet, in NAD_1983_Albers,meters	-156855	meters
OUTLETYA83	Y coordinate of the outlet, in NAD_1983_Albers, meters	156535	meters
ROCKDEP	Depth to rock	2.4	feet

Parameter Code	Parameter Description	Value	Unit
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	0	percent
STRDEN	Stream Density -- total length of streams divided by drainage area	0	miles per square mile
STRMTOT	total length of all mapped streams (1:24,000-scale) in the basin	0	miles

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.44	square miles	2.26	1400
ELEV	Mean Basin Elevation	1059.2	feet	1050	2580

Low-Flow Statistics Disclaimers [Low Flow Region 4]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Low-Flow Statistics Flow Report [Low Flow Region 4]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.00993	ft^3/s
30 Day 2 Year Low Flow	0.0198	ft^3/s
7 Day 10 Year Low Flow	0.00278	ft^3/s
30 Day 10 Year Low Flow	0.00627	ft^3/s
90 Day 10 Year Low Flow	0.013	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Bankfull Statistics Parameters [Statewide Bankfull Noncarbonate 2018 5066]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.44	square miles	2.62	207
CARBON	Percent Carbonate	0	percent		

Bankfull Statistics Disclaimers [Statewide Bankfull Noncarbonate 2018 5066]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Bankfull Statistics Flow Report [Statewide Bankfull Noncarbonate 2018 5066]

Statistic	Value	Unit
Bankfull Area	6.44	ft^2
Bankfull Streamflow	23.3	ft^3/s
Bankfull Width	9.8	ft
Bankfull Depth	0.699	ft

Bankfull Statistics Citations

Clune, J.W., Chaplin, J.J., and White, K.E.,2018, Comparison of regression relations of bankfull discharge and channel geometry for the glaciated and nonglaciated settings of Pennsylvania and southern New York: U.S. Geological Survey Scientific Investigations Report 2018–5066, 20 p. (https://doi.org/10.3133/sir20185066)

Annual Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.44	square miles	2.26	1720
ELEV	Mean Basin Elevation	1059.2	feet	130	2700
PRECIP	Mean Annual Precipitation	37	inches	33.1	50.4
FOREST	Percent Forest	45	percent	5.1	100
URBAN	Percent Urban	51	percent	0	89
CARBON	Percent Carbonate	0	percent	0	99

Annual Flow Statistics Disclaimers [Statewide Mean and Base Flow]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Annual Flow Statistics Flow Report [Statewide Mean and Base Flow]

Statistic	Value	Unit
Mean Annual Flow	0.559	ft^3/s
Harmonic Mean Streamflow	0.0937	ft^3/s

Annual Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Base Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.44	square miles	2.26	1720

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
PRECIP	Mean Annual Precipitation	37	inches	33.1	50.4
CARBON	Percent Carbonate	0	percent	0	99
FOREST	Percent Forest	45	percent	5.1	100
URBAN	Percent Urban	51	percent	0	89

Base Flow Statistics Disclaimers [Statewide Mean and Base Flow]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Base Flow Statistics Flow Report [Statewide Mean and Base Flow]

Statistic	Value	Unit
Base Flow 10 Year Recurrence Interval	0.179	ft^3/s
Base Flow 25 Year Recurrence Interval	0.159	ft^3/s
Base Flow 50 Year Recurrence Interval	0.147	ft^3/s

Base Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Peak-Flow Statistics Parameters [Peak Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.44	square miles	0.92	1720

Peak-Flow Statistics Disclaimers [Peak Flow Region 4]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Peak-Flow Statistics Flow Report [Peak Flow Region 4]

Statistic	Value	Unit
2 Year Peak Flood	33.3	ft^3/s
5 Year Peak Flood	63.4	ft^3/s
10 Year Peak Flood	90.1	ft^3/s
50 Year Peak Flood	168	ft^3/s
100 Year Peak Flood	210	ft^3/s
500 Year Peak Flood	332	ft^3/s

Peak-Flow Statistics Citations

Roland, M.A., and Stuckey, M.H.,2008, Regression equations for estimating flood flows at selected recurrence intervals for ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2008-5102, 57p. (http://pubs.usgs.gov/sir/2008/5102/)

Application Version: 4.2.1

APPENDIX B

HydraFlow Output

Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Oct 15 2018

MERRION OIL & GAS

Invert Elev Dn (ft)	= 713.80
Pipe Length (ft)	= 766.00
Slope (%)	= 2.43
Invert Elev Up (ft)	= 732.44
Rise (in)	= 48.0
Shape	= Circular
Span (in)	= 48.0
No. Barrels	= 1
n-Value	= 0.013
Culvert Type	= Circular Culvert
Culvert Entrance	= Smooth tapered inlet throat
Coeff. K,M,c,Y,k	= 0.534, 0.555, 0.0196, 0.9, 0.2

Embankment

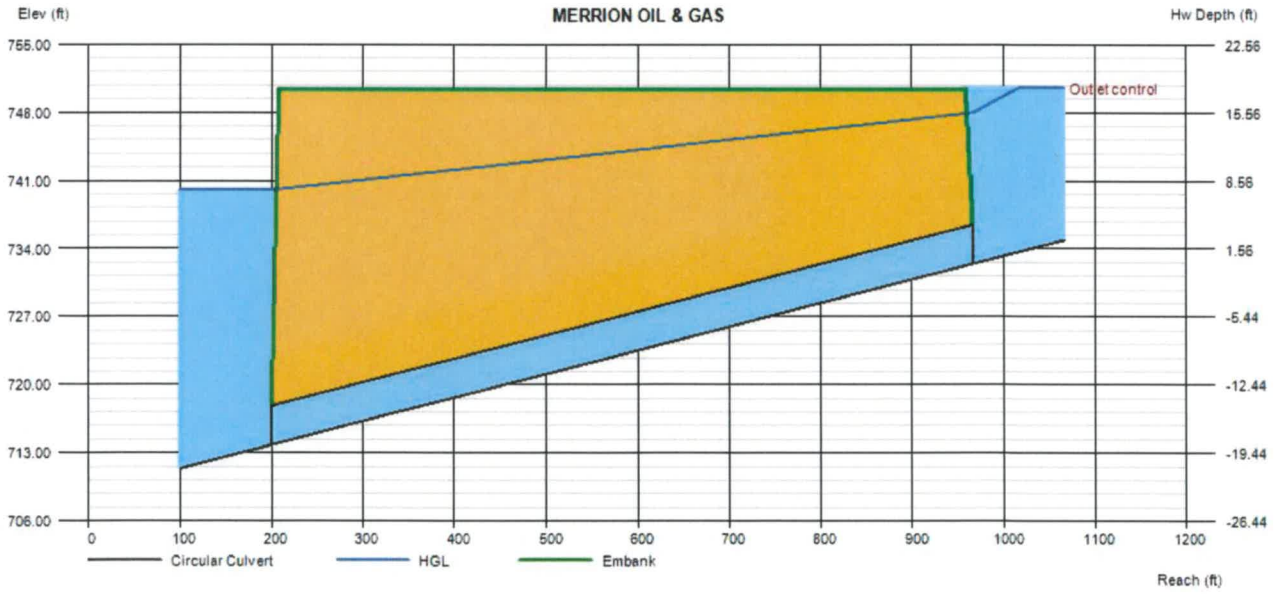
Top Elevation (ft)	= 750.44
Top Width (ft)	= 750.00
Crest Width (ft)	= 1000.00

Calculations

Qmin (cfs)	= 210.00
Qmax (cfs)	= 210.00
Tailwater Elev (ft)	= 740

Highlighted

Qtotal (cfs)	= 210.00
Qpipe (cfs)	= 146.52
Qovertop (cfs)	= 63.48
Veloc Dn (ft/s)	= 11.66
Veloc Up (ft/s)	= 11.66
HGL Dn (ft)	= 740.00
HGL Up (ft)	= 747.97
Hw Elev (ft)	= 750.51
Hw/D (ft)	= 4.52
Flow Regime	= Outlet Control



PA Fish and Boat Commission Clearance

A R M G r o u p I n c .

Pennsylvania Fish & Boat Commission

established 1866

Division of Environmental Services
Natural Gas Section
595 E Rolling Ridge Dr.
Bellefonte, PA 16823

June 11, 2018

IN REPLY REFER TO
SIR# 49603

Trant Corporation
Alexander Trant
11279 Perry Highway
Wexford, Pennsylvania 15090

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 657407_1
Merrion Oil & Gas ET Braddock 1H
ALLEGHENY County: East Pittsburgh Borough, North Braddock Borough, North Versailles Township

Dear Alexander Trant:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

Freshwater Mussels and Fish

Rare or protected freshwater mussel and fish species are known from the vicinity of the project area. Freshwater mussels are the most imperiled taxonomic group in North America. Nearly 20% of the species historically known to occur in the Commonwealth are now extirpated (locally extinct). Additionally 60% of Pennsylvania's remaining species are of conservation concern. We are concerned about direct and indirect (i.e., runoff) effects that the proposed project may have on the species of concern. Freshwater mussel and fish species are extremely vulnerable to physical (i.e., siltation, dredging, trenching, rip-rap) and chemical (i.e., pH, temperature, dissolved oxygen, organic contaminants, heavy metals) changes to their aquatic environment. Therefore, we recommend construction techniques that eliminate in-stream work, sedimentation and changes to water quality. I recommend that you avoid any in-stream disturbance or water quality degradation during and after the project installation. Storm sewers and retention basins should be designed so as to minimize/remove all silt from the water before it is released into the stream. Strict erosion and sedimentation control measures, as well as best management practices should be employed. Provided that these recommendations are followed, in-stream work is

avoided, strict E&S control measures are maintained, and best management practices are employed, we do not foresee any significant adverse impacts from the proposed activity to the freshwater mussel or fish species of concern.

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Gary Smith at 814-279-3080 and refer to the SIR # 49603. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Gary A. Smith

Gary Smith
Natural Gas Section

GAS/dn