



REMEDIAL INVESTIGATION/REMEDIAL ACTION WORKPLAN

OCTOBER 2019

**COLONIAL PIPELINE COMPANY – BEL AIR PUMP STATION
2942 CHARLES STREET, FALLSTON, HARFORD COUNTY, MARYLAND**

MDE CASE No. 18-0459HA

PREPARED FOR:

COLONIAL PIPELINE COMPANY
1185 SANCTUARY PARKWAY, SUITE 100
ALPHARETTA, GA 30009

PREPARED BY:

TRC ENVIRONMENTAL CORPORATION
1801 MARKET STREET, SUITE 1380
PHILADELPHIA, PA 19103

OCTOBER 14, 2019





October 7, 2019

Submitted Via FedEx

Lindley Campbell, Geologist, Oil Control Program
Maryland Department of the Environment
1800 Washington Blvd, Suite 620
Baltimore, MD 21230

**RE: Bel Air Station, Harford County, Maryland
MDE Case No. 18-0459HA
Remedial Investigation/Remedial Action Work Plan
(Station Well Modification, Monitoring Well Installations, and Supplemental Excavation)**

Ms. Campbell:

On behalf of Colonial Pipeline Company (Colonial) TRC Environmental Corporation (TRC) has prepared this workplan to complete three (3) tasks at Colonial's Bel Air Station (Site) for Maryland Department of the Environment (MDE) review. The three (3) tasks are: 1) modification and conversion of the on-site supply well to a deep monitoring well; 2) installation of three (3) downgradient monitoring wells, and 3) supplemental remedial excavation at the HA-3 Area. The purpose of this workplan is to expand the monitoring network to capture potential groundwater concentrations downgradient of the Site's substation, further delineate dissolved phase groundwater concentrations upgradient and down gradient of MW-6 and remove additional source area impacts associated with the HA-3 Area that appear to be contributing to dissolved phase groundwater concentrations at the MW-5 Area.

Task 1 – Station Well Modification and Conversion to a Monitoring Well

The existing Station Well consists of a six-inch diameter borehole with steel casing extending from approximately ground surface to 36-feet below ground surface (bgs). The borehole is open (uncased) hole from 36 ft bgs to a measured total depth (TD) of 203-feet bgs. TRC proposes converting this well into a deep monitoring well by retrofitting the well as shown on **Figure 1**. Bentonite chips will be used to seal the well from 203-feet to 60-feet bgs. The current 6-inch open well borehole will then be retrofitted with 10-feet of 4-inch diameter pre-packed screen from 60 to 50-feet bgs (with additional sand as needed) to capture the primary fracture zone identified during borehole geophysical logging conducted in August 2019 and detailed in the most recent Quarterly Monitoring Report. The well will then be extended to above grade with 52-feet of 4-inch PVC riser and protected by a steel stick-up casing set in concrete. Above the sand pack the well will be sealed with 5-feet of bentonite chips and grouted with a bentonite cement slurry to grade to seal the annular space between the current steel casing and the new screened section.

The well retrofitting will be completed by a Maryland-licensed well driller, and an updated well completion report will be filed with the Harford County Health Department.

Task 2 – Monitoring Well Installations

As shown on **Figure 2**, three (3) additional permitted monitoring wells designated MW-12, MW-13, and MW-14 will also be installed downgradient of the MW 5 Area (MW-12 and MW-13) and downgradient of MW-6 (MW-14). The locations are based on groundwater flow direction data collected from monthly gauging events, and with respect to MW-14 the well is targeted to intercept the buried historical stream channel down gradient of MW-6. The monitoring wells will be constructed of 4-inch diameter schedule 40 PVC casing and 20-slot screen and will be installed to intercept the groundwater table and the contact with fill material and in-situ geologic material (saprolite). The proposed locations are based on the following:

- MW-12 and MW-13 are located to evaluate groundwater concentrations downgradient from the MW-5 to capture potential groundwater concentrations that may have migrated under the Site's electric substation.

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- MW-14 is located downgradient of MW-6 to delineate groundwater concentrations that may have migrated beyond MW-6. The monitoring well is to be installed at the location shown on **Figure 3**, within the historical (pre-station) topographic valley streambed that was discussed in conceptual site model outlined in the previously submitted Subsurface Investigation Reports. The MW-14 location is located on a hillside and near overhead power lines. The well location will be sited in the field based on well driller feedback and safety concerns.

Prior to installation of the monitoring wells, soil cores will be collected from each location to confirm lithology and groundwater depth. All monitoring and recovery wells will be permitted and installed by a Maryland-licensed well driller, and permits will be obtained and filed with the Harford County Health Department.

Task 3 – Supplemental Remedial Investigation

The primary objective of this excavation is to remove remaining impacted soil northeast of the 2018 HA-3 LNAPL Excavation, northeast of Pump Unit 3, and below the station loop road. Light Non-Aqueous Phase Liquid (LNAPL) petroleum product (product) has occasionally been observed in recovery well RW-2 during periods of high water and high concentrations of dissolved-phase petroleum compounds have been documented in surrounding recovery and monitoring wells. TRC anticipates that the soil in this area, which could not be removed during the 2018 excavation activities due to logistics of the concurrent system integrity work, is a source for the observed product and elevated dissolved-phase compounds.

It is anticipated that the excavation, detailed on the attached **Figure 4**, will be an “L” shape measuring approximately 30-feet wide and 45-feet long, with a maximum depth of 8-feet below ground surface. Eight feet was the approximate depth of the saprolite interface observed during the primary HA-3 excavation. The proposed excavation is designed to stay a minimum of 5-feet off Pump Unit 3 to maintain geotechnical stability. The proposed excavation footprint may be field-adjusted due to subsurface pipeline utilities and field feedback from colonial technicians, project inspectors, and contractors, but attainment of the drawn extents will maximize removal of impacted source material.

The anticipated approximate volume of the excavation is 305-cubic yards of soil, which will be transported offsite for disposal at Soil Safe of Logan Township, New Jersey or another licensed soil recycling facility. This excavation encompasses three recovery wells (RW-2, RW-3, and RW-4). The recovery wells within and around the excavation will be utilized as vacuum extraction wells to dewater the excavation for sidewall stability and recover vapors for worker safety. Fluids recovered from the excavation and recovery wells will be transported offsite for disposal at Triumvirate of Baltimore, Maryland or another licensed recycling facility. Efforts will be made to excavate around the wells, keep them in place while the excavating and return them to recovery well status after excavation. Similar to the primary HA-3 Area excavation, the program will be conducted and backfilled in sections to minimize the amount of open excavation. After excavation, Sonotubes will be emplaced around the recovery wells for protection of the PVC casings during backfill and for re-placement of well gravel during backfill operations. Sonotubes will be withdrawn as the excavation is filled.

Once the final depth of the excavation has been achieved, TRC will collect one sidewall soil sample approximately every 10-feet, for a maximum number of twelve (12) sidewall samples, and at least four (4) soil samples from the bottom of the excavation. Soil samples will be field screened with a Photoionization detector (PID) and analyzed for VOCs, including naphthalene and fuel oxygenates by Method 8260, as well as gas and diesel range organics. Proposed sample locations are depicted on **Figure 5**.

Prior to and during backfilling, to enhance remediation of remaining dissolved phase compounds, the excavation will be seeded with a commercial chemical oxidation additive to be selected by Colonial. Further, because there are geotechnical considerations for Pump Unit 3 Colonial may further seed the excavation with microscale liquid carbon which will act as an absorbent for dilute emissions from source material that may remain below the Pump Unit. The excavation will be backfilled with washed stone in the groundwater column and finished with clean fill to grade. Two feet of washed stone will be used from the excavation to approximately 6-feet below ground surface. The washed

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stone will be capped with a geotextile to minimize infiltration of fine grain soil from above and topped with compacted clean fill to ground surface with the following exception. As shown on **Figure 5**, along the excavation northeast boundary (line extending through RW-3 and RW-4) the stone will be topped with 3-feet of clean fill to approximately 3-feet below ground surface (i.e. the frost line) for installation of remediation infrastructure, likely conduit pipe, to be associated with the pending groundwater pump and treat system. This will minimize the need for additional trenching work in the future. Once the remediation system infrastructure is installed, the excavation will be backfilled to grade and prepped for restoration to its original surface conditions.

If you have any questions regarding this Work Plan, please contact Stan Carpenter at 856-381-4683 or David Kudla at 610-506-1478.

Sincerely,

TRC Environmental Corporation

David Kudla
Project Manager

Attachments

cc: S. Bull, MDE
S. Carpenter, Colonial Pipeline Company
R. Shenk, Colonial Pipeline Company

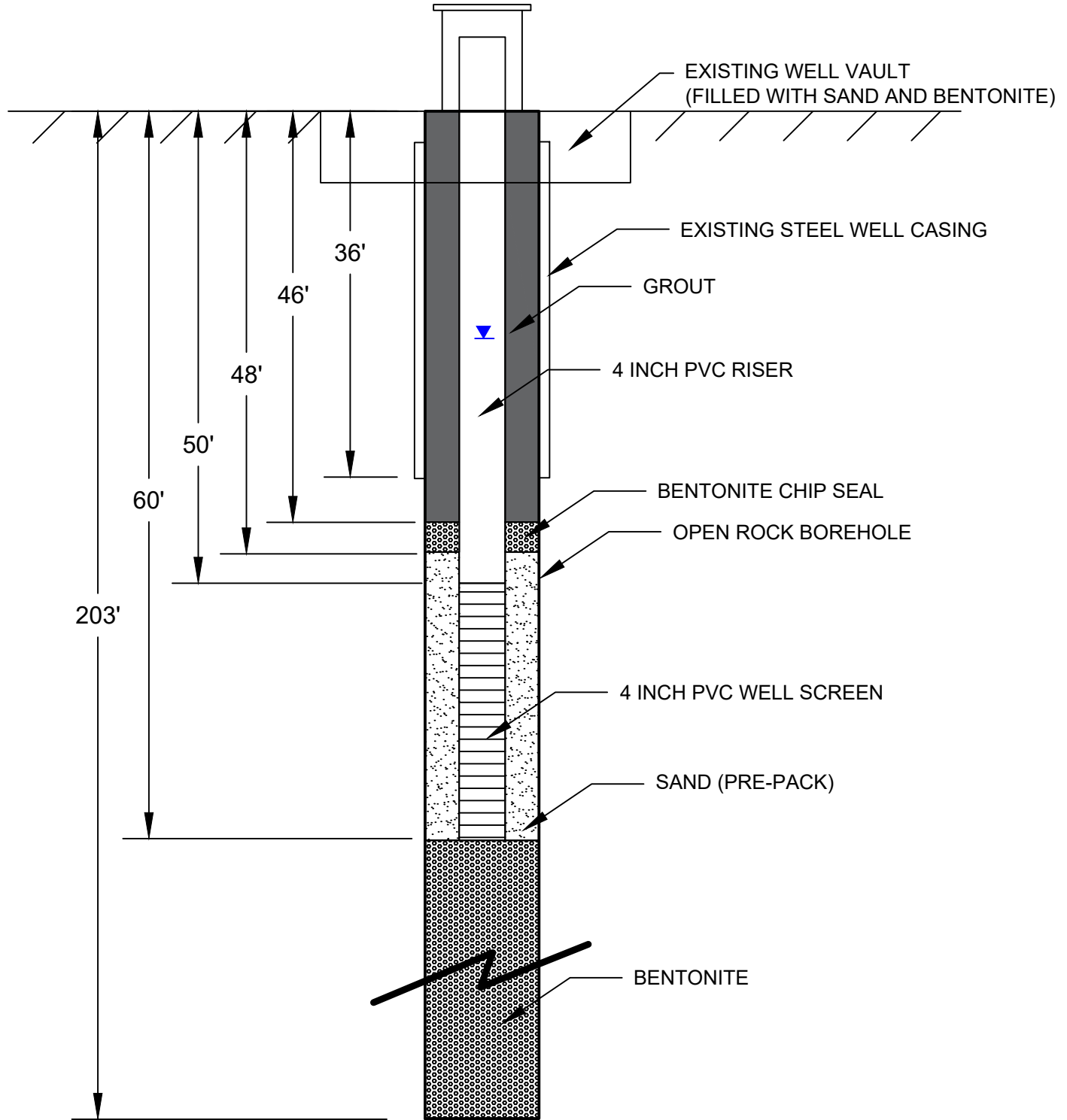


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FIGURES

Figure 1	Proposed Station Well Retrofit Specifications
Figure 2	Proposed Well Locations
Figure 3	Proposed Well Locations on Pre-Development Topography Map
Figure 4	Proposed Excavation Extents
Figure 5	Proposed Excavation Detail with Proposed Sample Locations

RETROFIT CONSTRUCTION DETAILS (NOT TO SCALE)



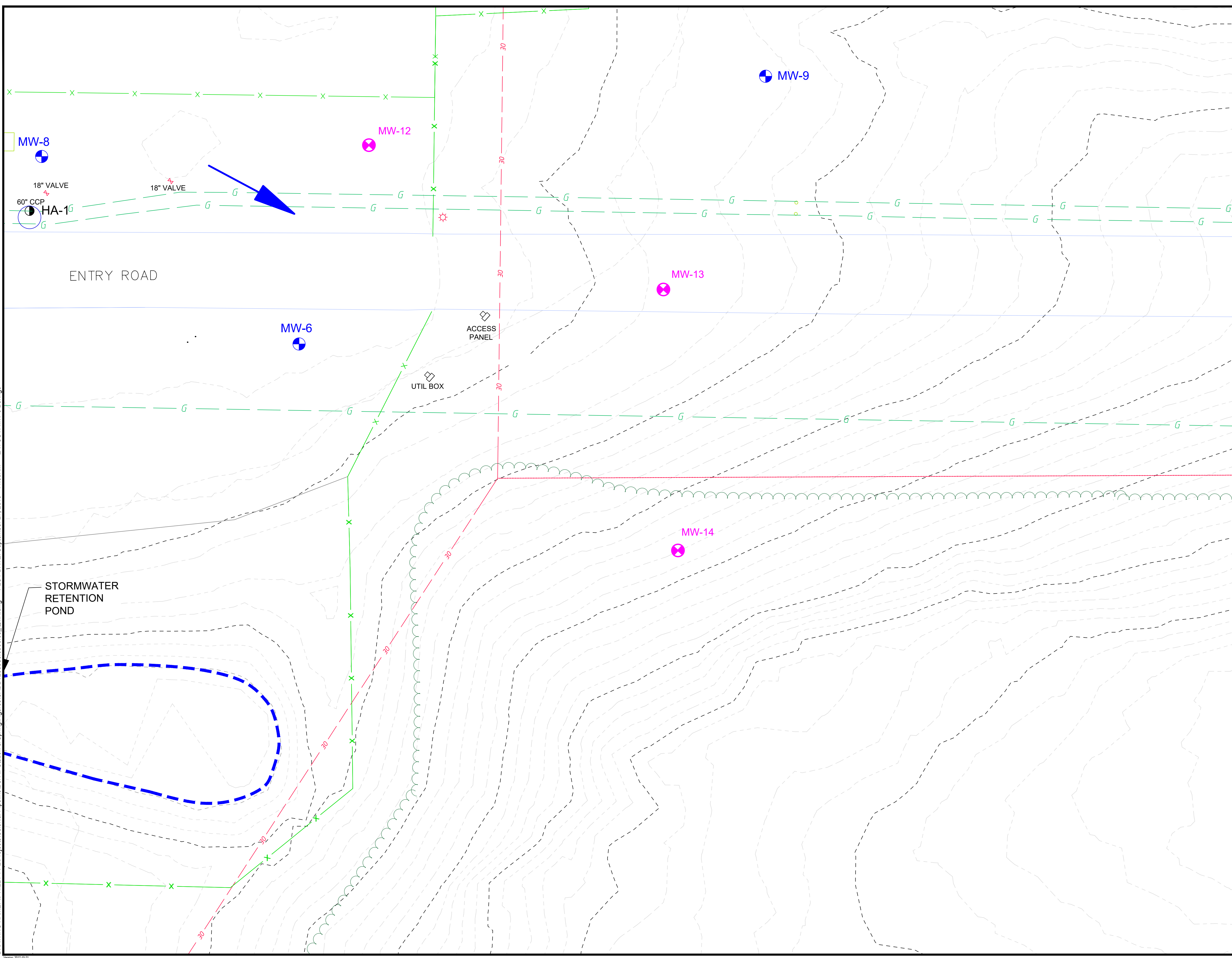
1801 Market Street
Suite 1380
Philadelphia, PA 19103
Phone: 215.563.2122

COLONIAL PIPELINE COMPANY
BEL AIR PUMP STATION
FALLSTON, HARFORD COUNTY, MARYLAND

DRAWN BY:	NR	APPROVED BY:	DC
CHECKED BY:	DK	DATE:	09/2019
FILE NO.:	299980.0000.03_RA.DWG		

PROPOSED STATION WELL RETROFIT SPECIFICATIONS	FIGURE
PROJ. NO.:	299980.0000.0000

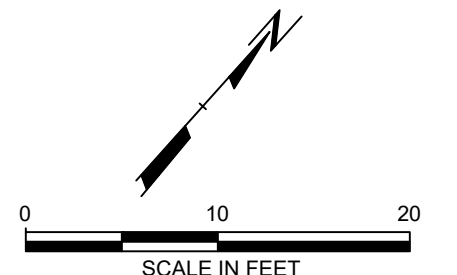
2024 ... USER: N.Rashid ... ATTACHED SHEETS: ... ATTACHED IMAGES: ...
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 Version: 2019.08.21



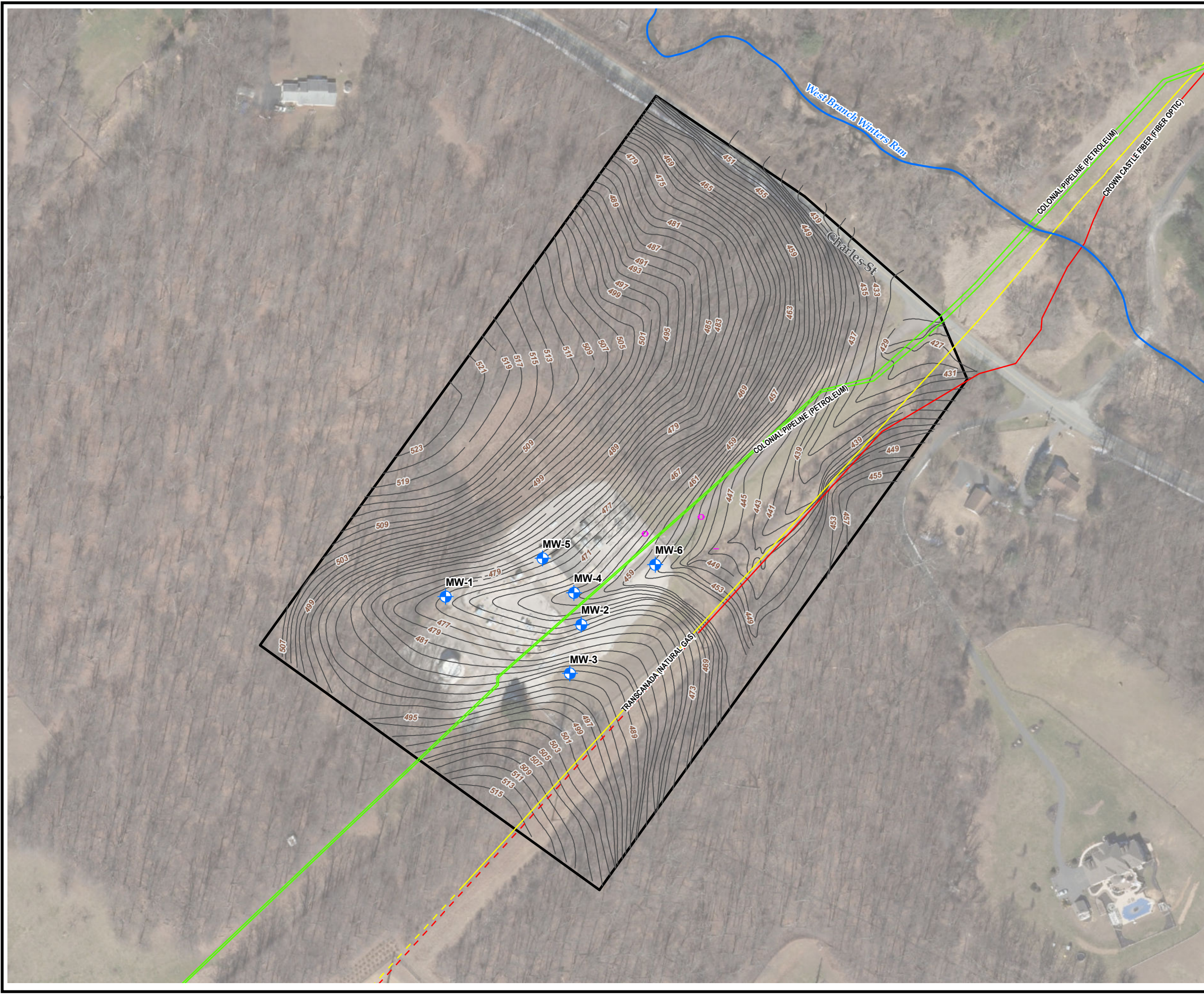
LEGEND	
	MONITORING WELL
	PROPOSED MONITORING WELL
	LIGHT POST
	HYDRANT
	FENCE
	OVERHEAD ELECTRIC LINE
	UNDERGROUND GAS LINE
	DIRECTION OF GROUNDWATER FLOW
	BRUSH LINE

OVERHEAD LINES ARE ESTIMATED TO BE AT LEAST 20' ABOVE GROUND SURFACE.

OSHA SAFETY REGULATIONS REQUIRE A MINIMUM APPROACH DISTANCE OF AT LEAST 10', WHICH INCREASES BASED ON LINE VOLTAGE.



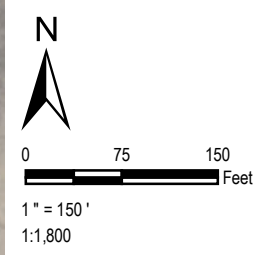
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TITLE:		PROPOSED WELL LOCATIONS	
DRAWN BY:	N. RASHID	PROJ. NO.:	299980.0000.0000
CHECKED BY:	D. KUDLA	FIGURE 2	
APPROVED BY:	D. CARLSON		
DATE:	AUGUST 2019		
		1801 Market Street Suite 1300 Philadelphia, PA 19103 Phone: 215.563.2122	
FILE NO.:	299980.0000.03_QMR.dwg		



LEGEND

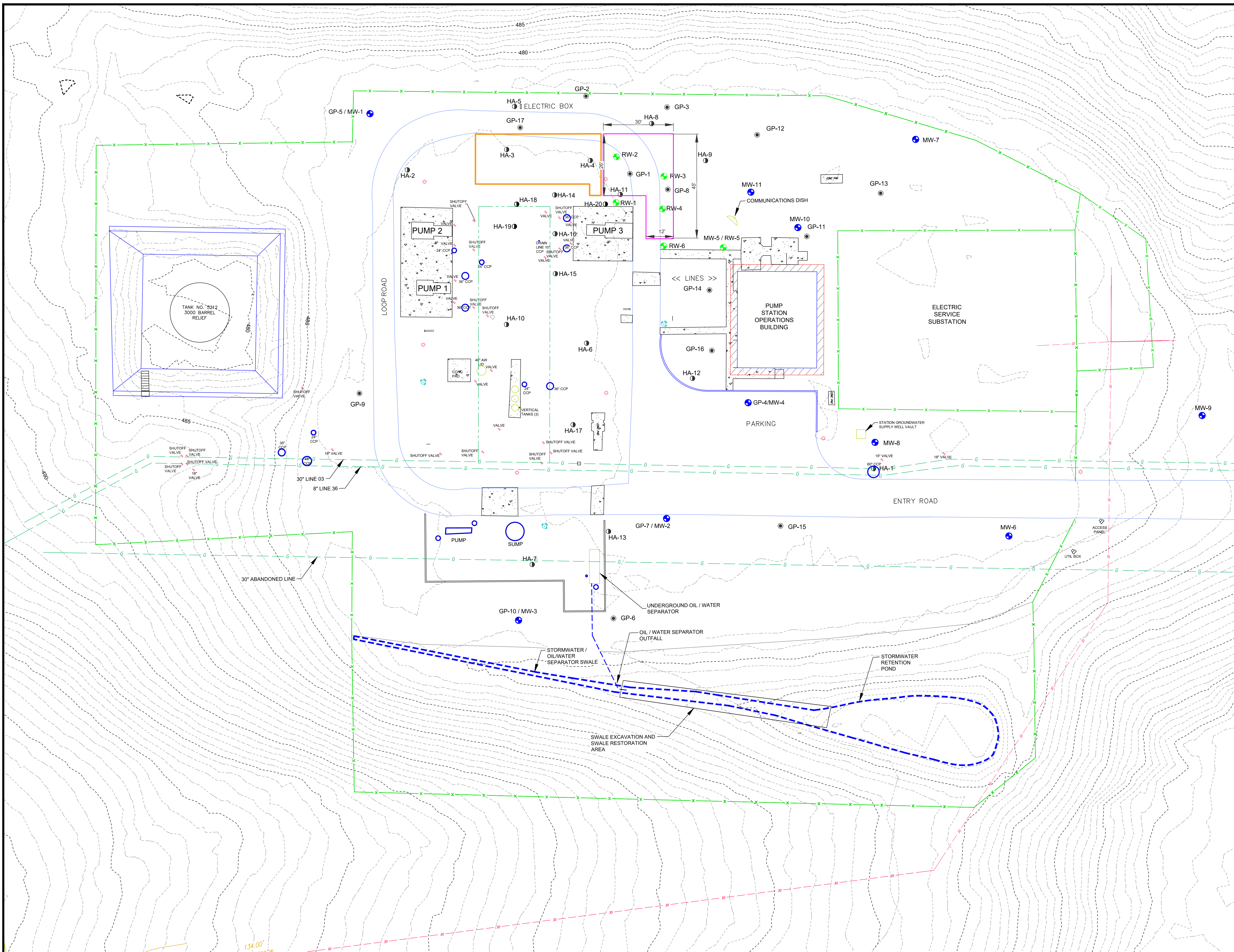
- MONITORING WELLS
- CREEK
- NATURAL GAS PIPELINE
- FIBER OPTIC CABLES
- PETROLEUM PIPELINE
- PROPERTY BOUNDARY
- 2' ELEVATION CONTOUR
- PROPOSED MONITORING WELL LOCATION

- NOTES**
1. BASE MAP IMAGERY FROM MARYLAND IMAP WEB SERVICE LAYER, 2016/2017.
 2. UTILITY LINE LOCATIONS ARE APPROXIMATE BASED ON SURFACE MARKINGS AND SITE OBSERVATIONS.



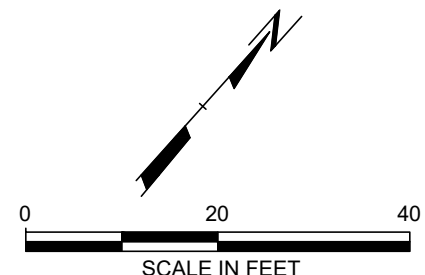
COLONIAL PIPELINE COMPANY BEL AIR PUMP STATION FALLSTON, HARFORD COUNTY, MARYLAND	
PROPOSED MONITORING WELL LOCATIONS ON PRE-DEVELOPMENT TOPOGRAPHY	
DRAWN BY: M. LOVELACE	PROJ. NO.: 299980.0000
CHECKED BY: D. KUDLA	FIGURE 3
APPROVED BY: D. CARLSON	
DATE: OCTOBER 2019	
1801 Market Street, Suite 1380 Philadelphia, PA 19103 Phone: 215.563.2122	
299980-0000-003.mxd	

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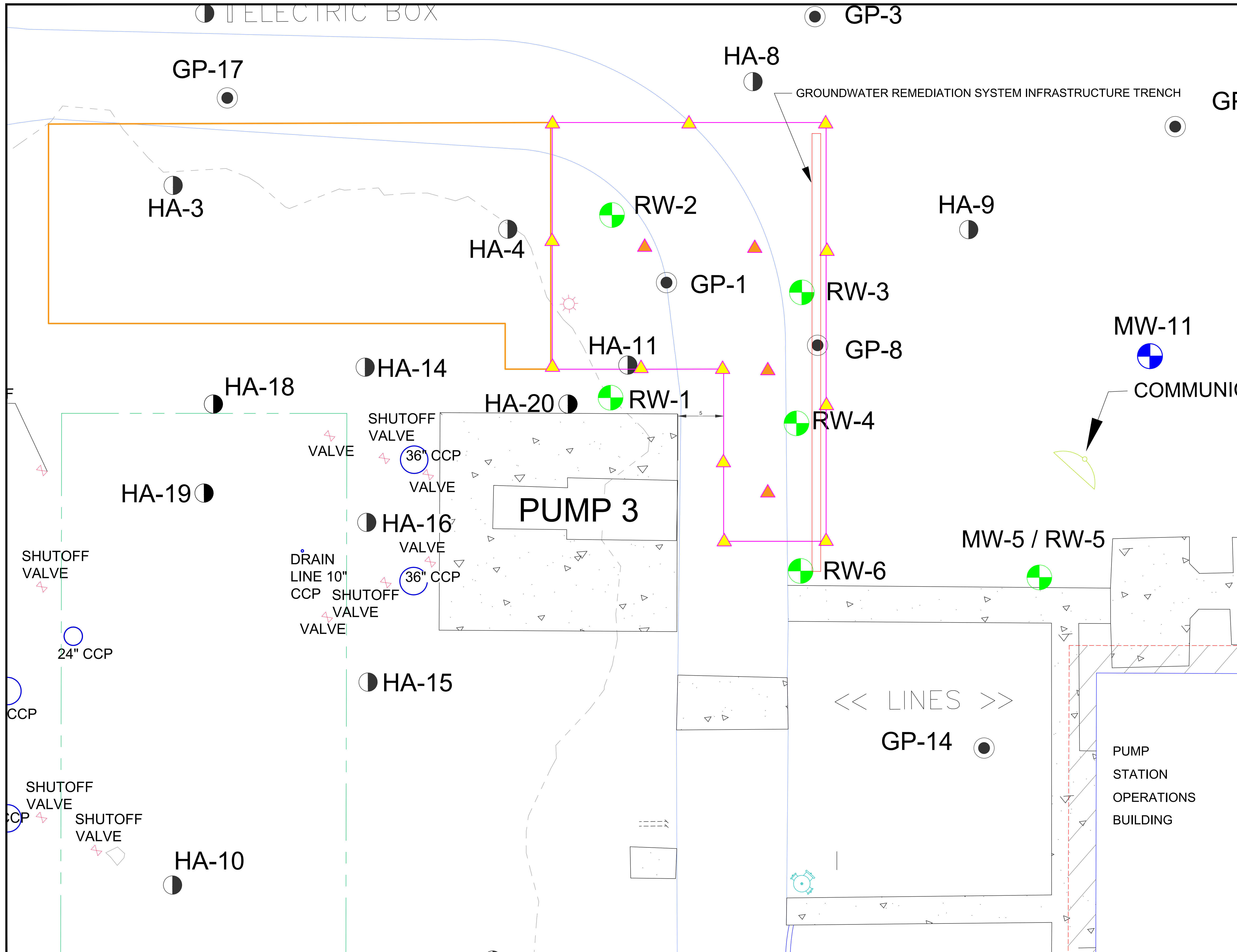
- LEGEND**
- GP-8 GEOPROBE BORING
 - MW-5 MONITORING WELL
 - HA-9 HAND AUGER BORING
 - RW-1 RECOVERY WELL
 - MW-8 MONITORING WELL
 - LIGHT POST
 - HYDRANT
 - APPROXIMATE LOOP LOCATION
 - FENCE
 - OVERHEAD ELECTRIC LINE
 - UNDERGROUND GAS LINE
 - EXTENTS OF 2018 HA-3 AREA EXCAVATION
 - PROPOSED EXCAVATION EXTENT

- NOTES:**
1. LOCATION OF YARD DRAIN EXCAVATION, STORMWATER SWALE, STORMWATER RETENTION POND, HAND AUGER SOIL BORINGS, AND POST EXCAVATION SOIL SAMPLES ARE APPROXIMATE.
 2. VALVE AND SHUTOFF VALVE LOCATIONS ARE SURVEYED GENERAL POINTS OF REFERENCE FOR PUMP STATION CONTROL POINTS AND PROCESS CONTROL FEATURES.
 3. AN ACCESS WELL IS AN OBSERVATION PORT TO SHALLOW SUBSURFACE VALVES AND CONTROL POINTS.
 4. THE PUMPING LOOP EXCAVATION AREA ADJACENT TO THE HA-3 EXCAVATION LIMITS IS SHOWN ON FIGURE 6 OF THE SIR II (TRC 2018c).



PROJECT:		COLONIAL PIPELINE COMPANY BEL AIR PUMP STATION FALLSTON, HARFORD COUNTY, MARYLAND	
TITLE:		PROPOSED EXCAVATION EXTENTS	
DRAWN BY:	N.RASHID	PROJ. NO.:	299980.0000.0000
CHECKED BY:	D.KUDLA	FIGURE 4	
APPROVED BY:	D.CARLSON		
DATE:	AUGUST 2019		
FILE NO.:	1801 Market Street Suite 1380 Philadelphia, PA 19103 Phone: 215.563.2122		
	299980.0000.03_RA.dwg		

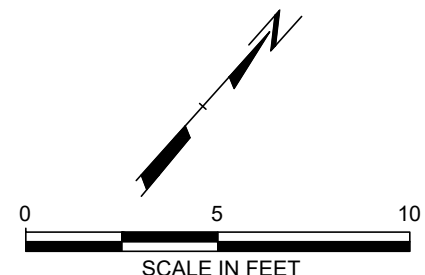
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LEGEND

● GP-8	GEOPROBE BORING
⊕ MW-5	MONITORING WELL
⊙ HA-9	HAND AUGER BORING
⊕ RW-1	RECOVERY WELL
⊕ MW-8	MONITORING WELL
⊙	LIGHT POST
⊕	HYDRANT
▲	PROPOSED EXCAVATION SIDEWALL SAMPLE
▲	PROPOSED EXCAVATION BOTTOM SAMPLE
---	APPROXIMATE LOOP LOCATION
---	FENCE
---	OVERHEAD ELECTRIC LINE
---	UNDERGROUND GAS LINE
---	EXTENTS OF 2018 HA-3 AREA EXCAVATION
---	PROPOSED RW-2 EXCAVATION EXTENT

- NOTES:**
1. LOCATION OF YARD DRAIN EXCAVATION, STORMWATER SWALE, STORMWATER RETENTION POND, HAND AUGER SOIL BORINGS, AND POST EXCAVATION SOIL SAMPLES ARE APPROXIMATE.
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 3. THE PUMPING LOOP EXCAVATION AREA ADJACENT TO THE HA-3 EXCAVATION LIMITS IS SHOWN ON FIGURE 6 OF THE SIR II (TRC 2018c).



PROJECT:		COLONIAL PIPELINE COMPANY BEL AIR PUMP STATION FALLSTON, HARFORD COUNTY, MARYLAND	
TITLE:		PROPOSED EXCAVATION DETAIL WITH PROPOSED SAMPLE LOCATIONS	
DRAWN BY:	RASHID	PROJ. NO.:	299980.0000.0000
CHECKED BY:	KUDLA	FIGURE 5	
APPROVED BY:	D. CARLSON		
DATE:	AUGUST 2019		
FILE NO.:		299980.0000.03_RA.dwg	

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