



DEPARTMENT OF THE ARMY

OFFICE OF ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
U.S. ARMY FORT MONMOUTH
P.O. 148
OCEANPORT, NEW JERSEY 07757

15 June 2018

Mr. Ashish Joshi
New Jersey Department of Environmental Protection
Division of Remediation Management & Response
Northern Bureau of Field Operations
7 Ridgedale Avenue (2nd Floor)
Cedar Knolls, NJ 07927-1112

**SUBJECT: UST 800-20 Site Investigation Report
Request for Unrestricted Use, No Further Action Approval
Fort Monmouth, Monmouth County, Oceanport, New Jersey
PI G000000032**

Dear Mr. Joshi:

The U.S. Army Fort Monmouth (FTMM) Team has prepared this Site Investigation (SI) Report to summarize previous investigations and present the results of additional field sampling at former Underground Storage Tank (UST) 800-20 in Parcel 56.

1.0 OBJECTIVES

Field screening borings and groundwater sampling was conducted in 2017 and 2018 to address New Jersey Department of Environmental Protection (NJDEP) comments on our 16 March 2017 Site Investigation Report Addendum (**Attachment A, Correspondence 3**). Proposed field investigation activities were documented in our August 2017 work plan which was approved by NJDEP (**Attachment A, Correspondences 1 and 2**).

2.0 SITE DESCRIPTION

Former UST 800-20, a steel 1,000-gallon tank used to store No. 2 fuel oil, was removed in July 2003. Former UST 800-20 was located approximately 300 feet southwest of the former First Atlantic Credit Union (Building 1006) in the southern portion of the Main Post (MP) of FTMM as shown on **Figure 1**. During the removal of the tank, potentially contaminated soils were observed surrounding the tank and approximately 80 cubic yards of petroleum-contaminated soil were excavated. Discharge Investigation and Corrective Action Report (DICAR) No. 03-07-30-1431 was submitted to NJDEP in July 2003.

2.1 Site Land Use

Former UST 800-20 was in an open field which is currently unoccupied. Adjacent land in all directions are currently unoccupied open fields. Future land use is designated as low density residential according to the Fort Monmouth Reuse and Redevelopment Plan (EDAW, 2008).

2.2 Site Geology and Hydrogeology

The Hornerstown Formation underlies much of the MP including the former UST 800-20 area and is approximately 25 to 30 feet (ft) thick based on other MP soil borings. This formation is distinguished by varying proportions of glauconitic clay, silty clay, and minor sand. The Tinton Formation underlies the Hornerstown Formation and consists of dense fine sand and trace silt, glauconite, and clay.

During the November 2017 field investigation at former UST 800-20, soil borings encountered primarily brown, coarse to fine sand with some clay and gravel. Soil borings logs are provided in **Attachment B**. The depth to groundwater at former UST 800-20 from approximately 7 to 12 ft below ground surface (bgs) in the soil borings, and 10 to 11.5 ft bgs in monitoring wells (**Table 1**). Groundwater was typically encountered in the brown sands and flows north-northeast towards Oceanport Creek (**Figure 3**).

3.0 PREVIOUS INVESTIGATIONS

As previously documented (**Attachment A, Correspondences 4 and 8**), UST 800-20 was removed in July 2003 and post-excavation soil samples were collected along the sidewalls and bottom of the excavation and analyzed for total petroleum hydrocarbons (TPH). The initial post-excavation soil samples contained TPH concentrations above the then-current NJDEP criterion of 10,000 milligrams per kilogram (mg/kg) for total organic contaminants (N.J.A.C. 7:26E and revisions dated February 3, 1994). After further soil excavation, subsequent post-excavation soil sample results were non-detect (ND) to 181 mg/kg for TPH. NFA approval was requested by the Army in 2015 for former UST 800-20. However, NJDEP concluded (letter dated 10 November 2015) that a groundwater investigation was required (**Attachment A, Correspondence 7 and 8**).

In August 2016, the Army performed initial groundwater investigation work in response to NJDEP comments on our 3 March 2016 work plan (**Attachment A, Correspondence 5 and 6**). Temporary well ARE-800-TMW-08 was installed downgradient from former UST 800-20, sampled, and subsequently abandoned. As shown on **Table 2**, one VOC (1,1,2-trichloroethane), six SVOCs (2-methylnaphthalene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, and indeno[1,2,3-cd]pyrene) and the total sum SVOC tentatively identified compounds (TICs) exceeded NJDEP Ground Water Quality Criteria (GWQC).

Based on the August 2016 results, the Army and NJDEP agreed that additional remedial efforts for groundwater were necessary (**Attachment A, Correspondence 3 and 4**). As described below, the Army conducted additional soil and groundwater investigations in 2017 and 2018 to confirm and delineate groundwater contamination.

4.0 2017 AND 2018 SITE INVESTIGATION RESULTS

NJDEP approved the Army's 2017 August Supplemental Unregulated Heating Oil Tank work plan to continue the UST 800-20 groundwater investigation (**Attachment A, Correspondence 1**). In November 2017, six field screening borings (PAR-56-800-20-SCREEN1 through PAR-56-800-20-SCREEN6) were logged visually and with a PID. Indications of fill such as asphalt and coal were observed in borings PAR-56-800-20-SCREEN3 and PAR-56-800-20-SCREEN4 at varying depths from 0 to 3.5 ft below ground surface (bgs). Elevated PID readings were observed during the boring operations for PAR-55-800-12-SCREEN2 and PAR-55-800-12-SCREEN3 near the groundwater at a

depth of 7.5 ft bgs (**Figure 2** and **Attachment B**). The elevated PID results were consistent with a northeasterly plume migration direction from the former tank. Boring logs and field notes are provided in **Attachments B and C**. Analytical results were compared to NJDEP criteria in accordance with guidance for No. 2 fuel oil petroleum hydrocarbon mixtures (NJDEP, 2010 and Table 2-1 of NJDEP, 2012).

4.1 Groundwater Results

Three temporary monitor wells (PAR-56-800-20-TMW-01 through 03) were installed, sampled and abandoned approximately 60 ft downgradient of former UST 800-20. The location originally planned for PAR-56-800-20-TWM-01 was relocated 50 ft west of TWM-03 because, based on the field screening boring results, contaminant migration was interpreted to be towards the north-northeast, instead of towards the northwest as indicated in the 2017 work plan. A fourth temporary monitor well was planned further downgradient but was not installed because contamination was not observed at the first three temporary wells and there were no elevated PID readings noted on the boring logs (**Attachment B**).

In November/December 2017, two permanent monitoring wells were installed (**Table 1**, **Figure 2** and **Attachment B**). Permanent well PAR-56-800-20-MW-01 was placed in the vicinity of the former UST, and well PAR-56-800-20-MW-02 was placed approximately 80 ft downgradient of the former UST. A third well was planned further downgradient but was not installed because contamination was not observed during installation of the temporary or permanent wells. The two new permanent wells were sampled in January 2018 and the samples were analyzed for VOCs and SVOCs (**Table 3**) in accordance with the NJDEP requirements for No. 2 fuel oil.

4.1.1 Exceedances of NJDEP Comparison Criteria

An exceedance of the NJDEP GWQC occurred at only one of the temporary wells sampled during the 2017 sampling event (see **Table 2**). The bis(2-ethylhexyl)phthalate concentration of 9.6 J $\mu\text{g/L}$ (where “J” indicates an estimated concentration) in temporary well PAR-56-800-20-TMW-03 exceeded the NJDEP GWQC of 3 $\mu\text{g/L}$.

Only one analyte (benzo(a)anthracene) exceeded the NJDEP GWQC in one permanent well. The benzo(a)anthracene concentration of 0.19 J $\mu\text{g/L}$ in well PAR-56-800-20-MW-02 slightly exceeded the GWQC of 0.1 $\mu\text{g/L}$ during the 2018 permanent well sampling event (see **Table 3**).

4.1.2 Significance of Groundwater Results

Bis(2-ethylhexyl)phthalate and benzo(a)anthracene are not typically related to fuel oil contamination. Bis(2-ethylhexyl)phthalate, a common field and laboratory contaminant, was detected above the GWQC in one temporary well (PAR-56-800-20-TMW-03).

Benzo(a)anthracene and other polynuclear aromatic hydrocarbons (PAHs) have been encountered at other FTMM locations in surficial soils and fill that are unrelated to fuel oil. The slight exceedance of benzo(a)anthracene at PAR-56-800-20-MW-02 may be the result of entrainment of soil in the groundwater sample resulting from sample turbidity (see **Attachment C**). The multiple exceedances of fuel oil constituents that were detected at the former tank location in temporary well ARE-800-TMW-08 in 2016 (**Table 2**) were not confirmed with the permanent well results from PAR-56-800-20-MW-01 (**Table 3**). In comparison to temporary well results, the results from permanent wells are much

more representative of groundwater conditions because permanent wells are properly developed and purged prior to low flow groundwater sampling.

5.0 SUMMARY AND RECOMMENDATIONS

There were no GWQC exceedances in samples collected from the permanent wells, with the exception of one constituent (benzo(a)anthracene) that, as described in Section 4.1.1 only slightly exceeded the GWQC. As discussed in Section 4.1.2, benzo(a)anthracene is not typically related to fuel oil contamination. Based on the results of the groundwater investigation, the Army has determined that further remedial efforts are not warranted, and an Unrestricted Use, NFA determination is requested for former UST 800-20.

Thank you for reviewing this request; we look forward to your approval and/or comments. Our technical Point of Contact is Kent Friesen at (732) 383-7201; kent.friesen@parsons.com. I can be reached at (732) 380-7064; william.r.colvin18.civ@mail.mil.

Sincerely,



William R. Colvin
BRAC Environmental Coordinator

cc: Ashish Joshi (e-mail and 2 hard copies)
William Colvin, BEC (e-mail and 1 hard copy)
Joseph Pearson, Calibre (e-mail)
James Moore, USACE (e-mail)
Jim Kelly, USACE (e-mail)
Joseph Fallon, FMERA (e-mail)
Cris Grill, Parsons (e-mail)

Attachments:

Figure 1 – UST 800-20 Site Location

Figure 2 – Parcel 56 - UST 800-20 Site Layout and Sampling Location

Figure 3 – Parcel 56 – UST 800-20 Groundwater Contours – January 15, 2018

Table 1 - Groundwater Gauging Data and Elevations (January 15, 2018)

Table 2 – Ground Water Sampling Results for Temporary Wells – Comparison to NJDEP Ground Water Quality Criteria

Table 3 – Ground Water Sampling Results for Permanent Wells – Comparison to NJDEP Ground Water Quality Criteria

Attachment A - Regulatory Correspondence

Attachment B – Soil Boring Logs and Well Construction Details

Attachment C – Field Notes

REFERENCES CITED:

- EDAW, Inc., 2008. *Fort Monmouth Reuse and Redevelopment Plan, Final Plan*. Prepared for Fort Monmouth Economic Revitalization Planning Authority. August 22.
- NJDEP. 2010. *Protocol for Addressing Extractable Petroleum Hydrocarbons*. Site Remediation Program. Version 5.0, August 9.
- NJDEP. 2012. *New Jersey Administrative Code (NJAC) 7:26E, Technical Requirements for Site Remediation*. Last amended May 7, 2012.



New Jersey Department of Environmental Protection
Site Remediation Program

Report Certifications for RCRA GPRA 2020, CERCLA, and Federal Facility Sites

These certifications are to be used for reports submitted for RCRA GPRA 2020, CERCLA, and Federal Facility Sites. The Department has developed guidance for report certifications for RCRA GPRA 2020, CERCLA, and Federal Facility Sites under traditional oversight. The "Person Responsible for Conducting the Remediation Information and Certification" is required to be submitted with each report. For those sites that are required or opt to use a Licensed Site Remediation Professional (LSRP) the report must also be certified by the LSRP using the "Licensed Site Remediation Professional Information and Statement". For additional guidance regarding the requirement for LSRPs at RCRA GPRA 2020, CERCLA and Federal Facility Sites see http://www.nj.gov/dep/srp/srra/training/matrix/quick_ref/rcra_cercla_fed_facility_sites.pdf.

Document:

- "UST 800-20 Site Investigation Report, Request for Unrestricted Use, No Further Action Approval, Fort Monmouth, Monmouth County, Oceanport, New Jersey" (15 June 2018)

PERSON RESPONSIBLE FOR CONDUCTING THE REMEDIATION INFORMATION AND CERTIFICATION

Full Legal Name of the Person Responsible for Conducting the Remediation: William R. Colvin
 Representative First Name: William Representative Last Name: Colvin
 Title: Fort Monmouth BRAC Environmental Coordinator (BEC)
 Phone Number: (732) 380-7064 Ext: _____ Fax: _____
 Mailing Address: P.O. Box 148
 City/Town: Oceanport State: NJ Zip Code: 07757
 Email Address: william.r.colvin18.civ@mail.mil

This certification shall be signed by the person responsible for conducting the remediation who is submitting this notification in accordance with Administrative Requirements for the Remediation of Contaminated Sites rule at N.J.A.C. 7:26C-1.5(a).

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, including all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.

Signature: *William R. Colvin* Date: 15 June 2018

Name/Title: William R. Colvin
BRAC Environmental Coordinator

Completed form should be sent to:

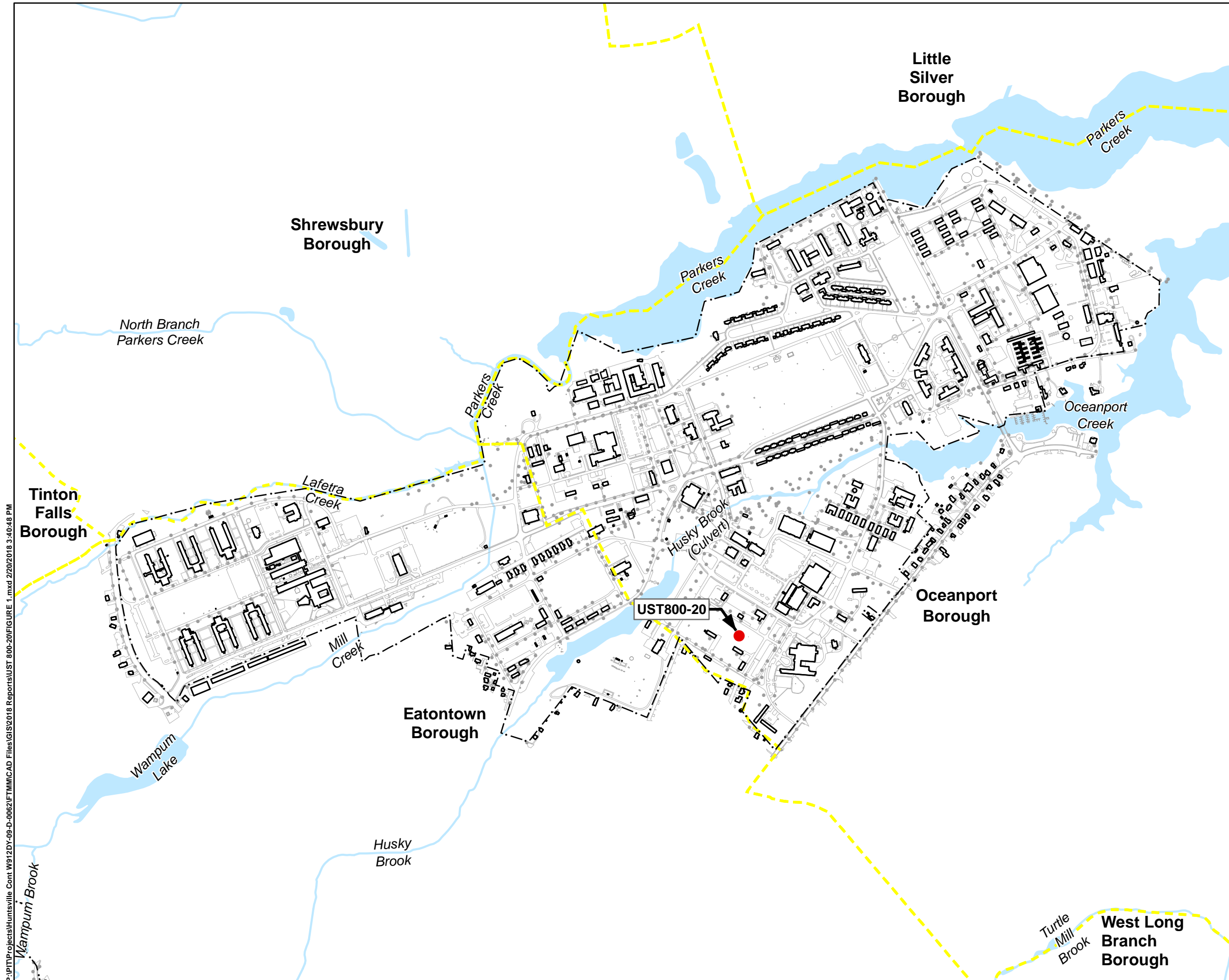
Mr. Ashish Joshi
 New Jersey Department of Environmental Protection
 Division of Remediation Management & Response
 Bureau of Northern Field Operations
 7 Ridgedale Avenue (2nd Floor)
 Cedar Knolls, New Jersey 07927-1112

FIGURES

Figure 1 –UST 800-20 Site Location

Figure 2 – Parcel 56 UST 800-20 Site Layout and Sampling Location

**Figure 3 – Parcel 56 – UST 800-20 Groundwater Contours –
January 15, 2018**

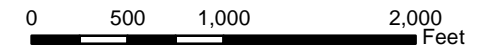


LEGEND:

- UHOT Location
- Installation Boundary
- Municipal Boundary
- Surface Water Feature



1 inch = 1,000 feet



Source: FTMM Supplied CAD, 2013; ESRI Data and Maps, 2011; USGS NHD, 2012.

PARSONS
401 Diamond Drive NW,
Huntsville AL

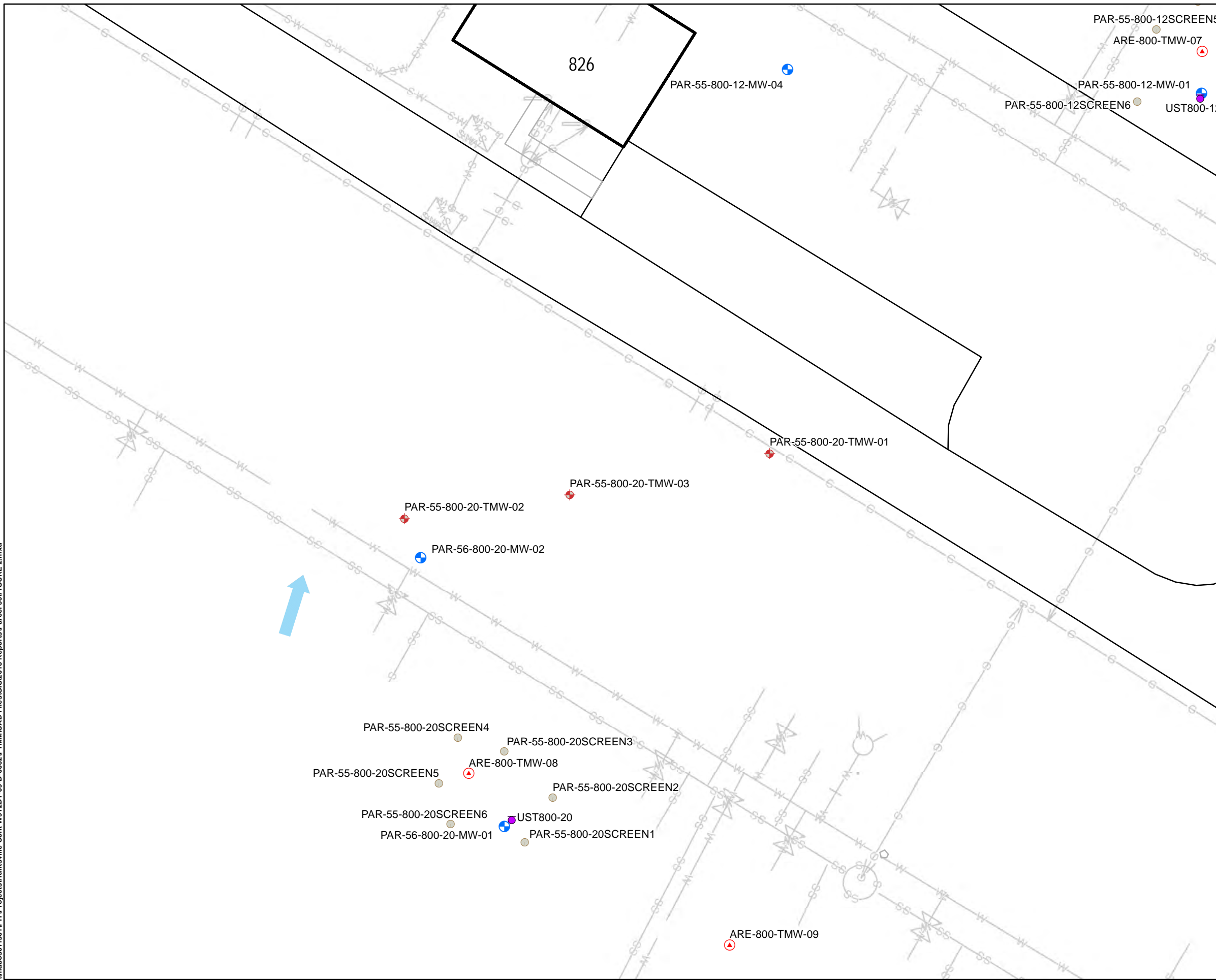
Fort Monmouth
New Jersey

UST800-20 SITE LOCATION

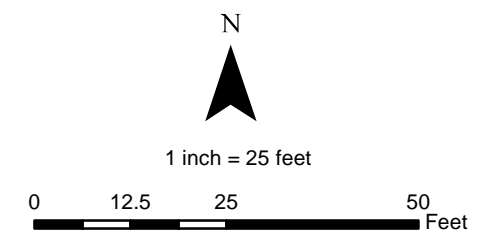
CREATED BY: RR	REVIEWED BY: JC
DATE: FEB. 2018	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-02130	FILE: FIGURE 1.mxd

P:\PTP\Projects\Huntsville_Cent W912DY-09-D-0062\FTMMCAD Files\GIS\2018 Reports\UST 800-20\FIGURE 1.mxd 2/20/2018 3:40:48 PM

\\mabos07fs01\PI\Projects\Huntsville Cont W\912DY-09-D-0062\FTMMCAD Files\GIS\2018 Reports\Parcel 56\Figure 2.mxd



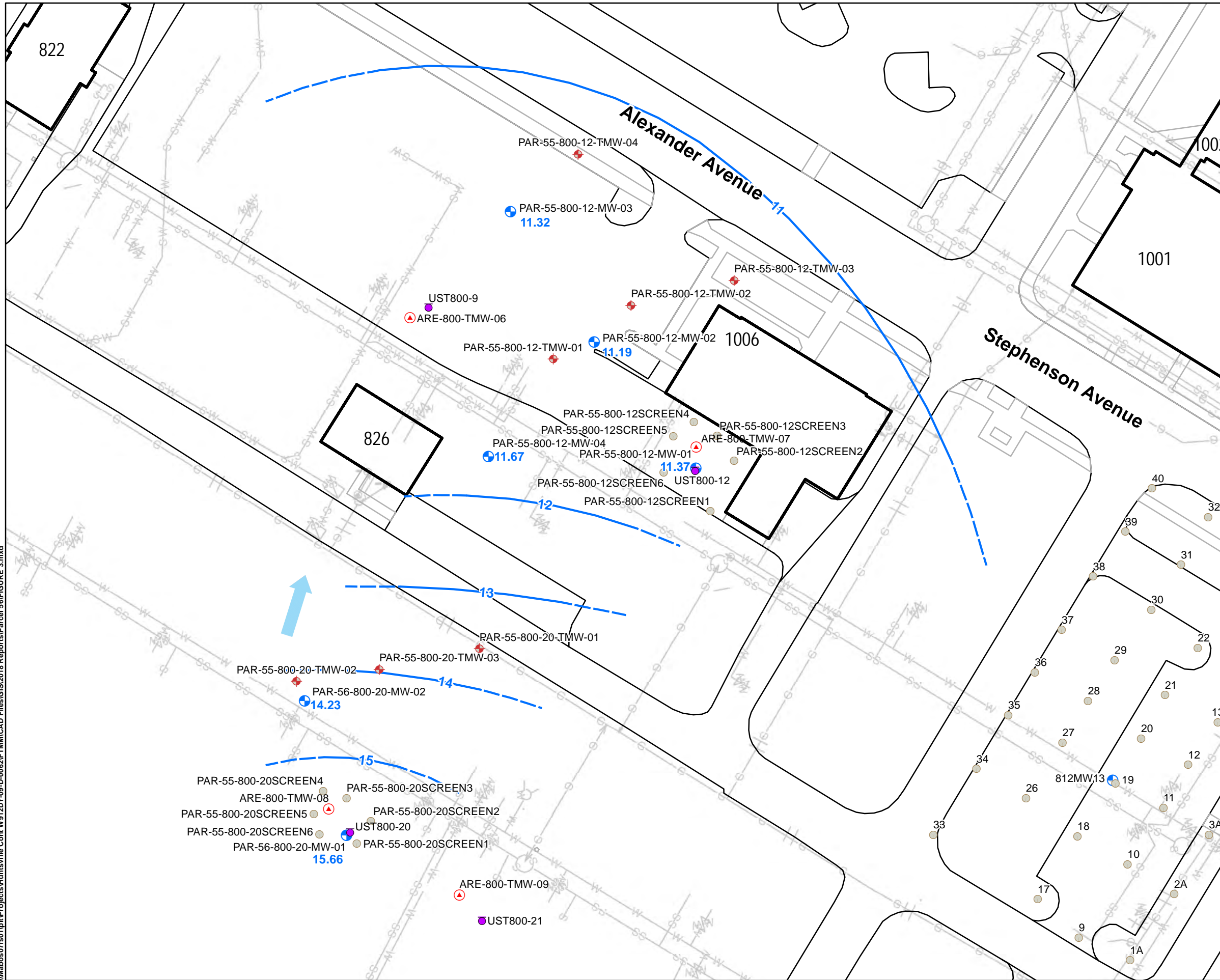
- LEGEND:**
- TEMPORARY MONITORING WELL
 - SOIL BORING
 - Groundwater Sample (2016)
 - Former UST Location
 - Shallow Monitoring Well
 - Water Line
 - Sanitary Sewer Line
 - Storm Sewer Line
 - Gas Line
 - Inferred Groundwater Flow Direction



Source: FTMM Supplied CAD, 2013.

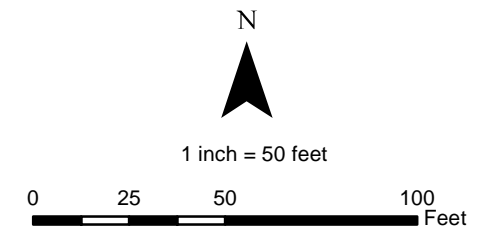
PARSONS 401 Diamond Drive NW, Huntsville AL		Fort Monmouth New Jersey	
PARCEL 56 UST 800-20 SITE LAYOUT AND SAMPLING LOCATION			
CREATED BY: RR	REVIEWED BY: KF	DATE: MAY. 2018	FIGURE NUMBER: FIGURE 2
PROJECT NUMBER: 748810-06031	FILE: FIGURE 2.mxd		

\\mabos07\fs01\p\Projects\Huntsville\Cont W\912DY-09-D-0062\FTMM\CAD Files\GIS\2018 Reports\Parcel 56\FIGURE 3.mxd



LEGEND:

- Temporary Monitoring Well
- Soil Boring
- Groundwater Sample (2016)
- Former UST Location
- Shallow Monitoring Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Groundwater Flow Direction
- Potentiometric Surface Elevation Contour
- Inferred Potentiometric Surface Elevation Contour
- 14.23 Groundwater Elevation Recorded on January 15, 2018 (NAD88) (ft)



Source: FTMM Supplied CAD, 2013.

PARSONS 401 Diamond Drive NW, Huntsville AL		Fort Monmouth New Jersey	
PARCEL 56 - UST800-20 GROUNDWATER CONTOURS - JANUARY 15, 2018			
CREATED BY: RR	REVIEWED BY: JC	DATE: APR. 2018	FIGURE NUMBER: FIGURE 3
PROJECT NUMBER: 748810-06031	FILE: FIGURE 3.mxd		

TABLES

Table 1 - Groundwater Gauging Data and Elevations (January 15, 2018)

**Table 2 – Ground Water Sampling Results for Temporary Wells –
Comparison to NJDEP Ground Water Quality Criteria**

**Table 3 – Ground Water Sampling Results for Permanent Wells –
Comparison to NJDEP Ground Water Quality Criteria**

Table 1
Groundwater Gauging Data and Elevations (January 15, 2018)
Parcel 56 UST 800-20
Fort Monmouth, New Jersey

Site	Well Permit #	Y Coord. (North)	X Coord. (East)	Installation Date	Depth	Well Riser Pipe Casing Length	Well Screen Length	Top of PVC Well Casing (elevation)	Slot Size	Flush Mount or Upright Protective Casing (FM or UR)	Protective Casing Elevation	Ground Surface Elevation	Gauge Time	Gauged Depth to Water	Gauged Depth to Bottom	Calculated Groundwater Elevation	Sampling Date
						(ft.)			inches					(ft. TOC)	(ft. TOC)	(ft.)	
PAR-56-800-20-MW-01	E201713115	537771.8	619994.2	11/17/2017	19.50	9.50	10.00	27.66	0.01	UR	28.13	24.93	13:46	12.00	20.49	15.66	1/17/2018
PAR-56-800-20-MW-02	E201713785	537840.7	619972.8	12/13/2017	20.00	10.00	10.00	27.03	0.01	UR	27.28	23.96	13:42	12.80	22.39	14.23	1/17/2018
PAR-55-800-12-MW-04	E201713783	537965.7	620066.8	12/13/2017	23.00	13.00	10.00	25.52	0.01	UR	25.82	22.79	13:21	13.85	22.80	11.67	1/17/2018

Notes:

- The synoptic round of water levels in the wells was collected on January 15, 2018.
- Well information were provided by FTMM for all wells installed before June 2013.
- ft = feet
- TOC = Top of Casing
- Elevation = feet above mean sea level
- N/A = information not available
- NS = Not Sampled
- **Bolded** top of casing elevations represent a mathematical adjustment between earlier NAD systems and the NAD 88 spatial system: the wells were reduced 1.09 feet to reflect the changes in the NAD systems.

TABLE 2
GROUND WATER SAMPLING RESULTS for TEMPORARY WELLS - COMPARISON TO NJDEP GROUND WATER QUALITY CRITERIA
SITE AREA 800, FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	A800-TMW-08	PAR-56-800-20-TMW-01	PAR-56-800-20-TMW-02	PAR-56-800-20-TMW-03	
Sample ID		ARE-800-TMW-08	PAR-56-800-20-TMW-01-13	PAR-56-800-20-TMW-02-13	PAR-56-800-20-TMW-03-13	
Sample Date		8/2/2016	11/8/2017	11/8/2017	11/8/2017	
Sample Round						
Filtered		Total		Total		Total
Volatiles Organic Compounds (µg/l)						
1,1,1,2-Tetrachloroethane	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,1,1-Trichloroethane	30	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,1,2,2-Tetrachloroethane	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,1,2-Trichloroethane	3	5.5	< 0.75	< 3.8 UJ	< 0.75	
1,1-Dichloroethane	50	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,1-Dichloroethene	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,1-Dichloropropene	100	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,2,3-Trichlorobenzene	100	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,2,3-Trichloropropane	0.03	< 2.5	< 2.5	< 12.5 UJ	< 2.5	
1,2,4-Trichlorobenzene	9	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,2,4-Trimethylbenzene	100	14.7	< 0.75	< 3.8 UJ	< 0.75	
1,2-Dibromo-3-chloropropane	0.02	< 2.5	< 2.5	< 12.5 UJ	< 2.5	
1,2-Dibromoethane	0.03	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,2-Dichlorobenzene	600	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,2-Dichloroethane	2	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,2-Dichloropropane	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,3,5-Trimethylbenzene	100	8.4	< 0.75	< 3.8 UJ	< 0.75	
1,3-Dichlorobenzene	600	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
1,3-Dichloropropane	100	< 0.75 UJ	< 0.75	< 3.8 UJ	< 0.75	
1,4-Dichlorobenzene	75	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
2,2-Dichloropropane	100	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
2-Chlorotoluene	100	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Acetone	6,000	4.8 J	3.3 J	< 18.8 UJ	5.7	
Benzene	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Bromobenzene	100	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Bromochloromethane	100	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Bromodichloromethane	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Bromoform	4	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Carbon tetrachloride	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Chlorobenzene	50	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Chlorodibromomethane	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Chloroethane	5	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Chloroform	70	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Cis-1,2-Dichloroethene	70	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Cis-1,3-Dichloropropene	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Cymene	100	4.7	< 0.75	< 3.8 UJ	< 0.75	
Dichlorodifluoromethane	1,000	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Ethyl benzene	700	2.8	< 0.75	< 3.8 UJ	< 0.75	
Hexachlorobutadiene	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75	
Isopropylbenzene	700	3.5	< 0.75	< 3.8 UJ	< 0.75	
Meta/Para Xylene	1,000	0.89 J	< 1.5	< 7.5 UJ	< 1.5	
Methyl bromide	10	< 0.75	< 0.75	< 3.8 UJ	0.41 J	
Methyl butyl ketone	300	< 3.8	< 3.8	< 18.8 UJ	< 3.8	
Methyl chloride	100	< 0.75	< 0.75	< 3.8 UJ	< 0.75	

Loc ID	NJ Ground Water Quality Criteria	A800-TMW-08	PAR-56-800-20-TMW-01	PAR-56-800-20-TMW-02	PAR-56-800-20-TMW-03
Sample ID		ARE-800-TMW-08	PAR-56-800-20-TMW-01-13	PAR-56-800-20-TMW-02-13	PAR-56-800-20-TMW-03-13
Sample Date		8/2/2016	11/8/2017	11/8/2017	11/8/2017
Sample Round					
Filtered		Total	Total	Total	Total
Volatile Organic Compounds (µg/l)					
Methyl ethyl ketone	300	< 3.8	< 3.8	< 18.8 UJ	< 3.8
Methyl isobutyl ketone	100	< 3.8	< 3.8	< 18.8 UJ	< 3.8
Methyl Tertbutyl Ether	70	< 0.75	< 0.75	< 3.8 UJ	< 0.75
Methylene chloride	3	< 0.75	< 0.75	< 3.8 UJ	< 0.75
Naphthalene	300	46.9	< 0.75	< 3.8 UJ	< 0.75
n-Butylbenzene	100	< 0.75	< 0.75	< 3.8 UJ	< 0.75
Ortho Xylene	1,000	< 0.75	< 0.75	< 3.8 UJ	< 0.75
p-Chlorotoluene	100	< 0.75	< 0.75	< 3.8 UJ	< 0.75
Propylbenzene	100	3.6	< 0.75	< 3.8 UJ	< 0.75
sec-Butylbenzene	100	6.8	< 0.75	< 3.8 UJ	< 0.75
Styrene	100	< 0.75	< 0.75	< 3.8 UJ	< 0.75
Tert Butyl Alcohol	100	< 12.5	< 12.5	< 62.5 UJ	< 12.5
tert-Butylbenzene	100	< 0.75	< 0.75	< 3.8 UJ	< 0.75
Tetrachloroethene	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75
Toluene	600	< 0.75	< 0.75	< 3.8 UJ	< 0.75
Total Xylenes	1,000	NA	< 2.3	< 11.3 UJ	< 2.3
Trans-1,2-Dichloroethene	100	< 0.75	< 0.75	< 3.8 UJ	< 0.75
Trans-1,3-Dichloropropene	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75
Trichloroethene	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75
Trichlorofluoromethane	2,000	< 0.75	< 0.75	< 3.8 UJ	< 0.75
Vinyl chloride	1	< 0.75	< 0.75	< 3.8 UJ	< 0.75
TIC VOCs (µg/l)					
Total TICs	500	232.1 JN	NA	NA	NA
Semivolatile Organic Compounds (µg/l)					
1,2,4-Trichlorobenzene	9	< 1.1	< 5	< 0.94	< 5
1,2-Dichlorobenzene	600	< 1.1	< 5	< 0.94	< 5
1,2-Diphenylhydrazine	20	< 1.1	< 5	< 0.94	< 5
1,3-Dichlorobenzene	600	< 1.1	< 5	< 0.94	< 5
1,4-Dichlorobenzene	75	< 1.1	< 5	< 0.94	< 5
2,4,5-Trichlorophenol	700	< 3.3	< 15	< 2.8	< 15
2,4,6-Trichlorophenol	20	< 1.1	< 5	< 0.94	< 5
2,4-Dichlorophenol	20	< 1.1	< 5	< 0.94	< 5
2,4-Dimethylphenol	100	< 5.5	< 25	< 4.7	< 25
2,4-Dinitrophenol	40	< 8.8	< 40	< 7.5	< 40
2,4-Dinitrotoluene	10	< 1.1	< 5	< 0.94	< 5
2,6-Dinitrotoluene	10	< 1.1	< 5	< 0.94	< 5
2-Chloronaphthalene	600	< 1.1	< 5	< 0.94	< 5
2-Chlorophenol	40	< 2.2	< 10	< 1.9	< 10
2-Methylnaphthalene	30	41.2	< 5	< 0.94	< 5
2-Methylphenol	100	< 1.1	< 5	< 0.94	< 5
2-Nitroaniline	100	< 1.1	< 5	< 0.94	< 5
2-Nitrophenol	100	< 2.2	< 10	< 1.9	< 10
3,3'-Dichlorobenzidine	30	< 3.3	< 15	< 2.8	< 15
3-Nitroaniline	100	< 2.2	< 10	< 1.9	< 10
4,6-Dinitro-2-methylphenol	1	< 5.5	< 25	< 4.7	< 25
4-Bromophenyl phenyl ether	100	< 1.1	< 5	< 0.94	< 5
4-Chloro-3-methylphenol	100	< 1.1	< 5	< 0.94	< 5
4-Chloroaniline	30	< 1.1	< 5	< 0.94	< 5
4-Chlorophenyl phenyl ether	100	< 1.1	< 5	< 0.94	< 5

Loc ID	NJ Ground Water Quality Criteria	A800-TMW-08	PAR-56-800-20-TMW-01	PAR-56-800-20-TMW-02	PAR-56-800-20-TMW-03
Sample ID		ARE-800-TMW-08	PAR-56-800-20-TMW-01-13	PAR-56-800-20-TMW-02-13	PAR-56-800-20-TMW-03-13
Sample Date		8/2/2016	11/8/2017	11/8/2017	11/8/2017
Sample Round					
Filtered		Total	Total	Total	Total
Semivolatile Organic Compounds (µg/l)					
4-Nitroaniline	5	< 1.1	< 5	< 0.94	< 5
4-Nitrophenol	100	< 5.5	< 25	< 4.7	< 25
Acenaphthene	400	< 1.1	< 5	< 0.94	< 5
Acenaphthylene	100	< 1.1	< 5	< 0.94	< 5
Anthracene	2,000	2 J	< 5	< 0.94	< 5
Benzidine	20	< 33 UJ	< 150	< 28.3	< 150
Benzo(a)anthracene	0.1	2.1 J	< 5	< 0.94	< 5
Benzo(a)pyrene	0.1	1.6 J	< 5	< 0.94	< 5
Benzo(b)fluoranthene	0.2	2.3	< 5	< 0.94	< 5
Benzo(ghi)perylene	100	0.72 J	< 5	< 0.94	< 5
Benzo(k)fluoranthene	0.5	0.83 J	< 5	< 0.94	< 5
Benzyl alcohol	2,000	< 2.2	< 10	< 1.9	< 10
Bis(2-Chloroethoxy)methane	100	< 1.1	< 5	< 0.94	< 5
Bis(2-Chloroethyl)ether	7	< 1.1	< 5	< 0.94	< 5
Bis(2-Chloroisopropyl)ether	300	< 1.1	< 5	< 0.94	< 5
Bis(2-Ethylhexyl)phthalate	3	< 1.1	1.4 J	2 J	9.6 J
Butyl benzyl phthalate	100	< 1.1	< 5	< 0.94	1.1 J
Carbazole	100	< 1.1	< 5	< 0.94	< 5
Chrysene	5	1.9 J	< 5	< 0.94	< 5
Cresol	NLE	< 1.1	< 5	< 0.94	< 5
Dibenz(a,h)anthracene	0.3	0.23 J	< 5	< 0.94	< 5
Dibenzofuran	100	6.6 J	< 5	< 0.94	< 5
Diethyl phthalate	6,000	< 1.1	< 5	0.35 J	< 5
Dimethyl phthalate	100	< 1.1	< 5	< 0.94	< 5
Di-n-butylphthalate	700	< 1.1	< 5	0.13 J	< 5
Di-n-octylphthalate	100	< 1.1	< 5	< 0.94	< 5
Fluoranthene	300	5.6	< 5	< 0.94	< 5
Fluorene	300	11.2	< 5	< 0.94	< 5
Hexachlorobenzene	0.02	< 1.1	< 5	< 0.94	< 5
Hexachlorobutadiene	1	< 1.1	< 5	< 0.94	< 5
Hexachlorocyclopentadiene	40	< 2.2	< 10	< 1.9	< 10
Hexachloroethane	7	< 1.1	< 5	< 0.94	< 5
Indeno(1,2,3-cd)pyrene	0.2	0.84 J	< 5	< 0.94	< 5
Isophorone	40	< 1.1	< 5	< 0.94	< 5
Naphthalene	300	16.2	< 5	< 0.94	< 5
Nitrobenzene	6	< 2.2	< 10	< 1.9	< 10
N-Nitrosodimethylamine	0.8	< 2.2	< 10	< 1.9	< 10
N-Nitroso-di-n-propylamine	10	< 1.1	< 5	< 0.94	< 5
N-Nitrosodiphenylamine	10	< 2.2	< 10	< 1.9	< 10
Pentachlorophenol	0.3	< 8.8	< 40	< 7.5	< 40
Phenanthrene	100	21.9	< 5	< 0.94	< 5
Phenol	2,000	< 1.1	< 5	< 0.94	< 5
Pyrene	200	5.7	< 5	< 0.94	< 5

Loc ID	NJ Ground Water Quality Criteria	A800-TMW-08	PAR-56-800-20-TMW-01	PAR-56-800-20-TMW-02	PAR-56-800-20-TMW-03
Sample ID		ARE-800-TMW-08	PAR-56-800-20-TMW-01-13	PAR-56-800-20-TMW-02-13	PAR-56-800-20-TMW-03-13
Sample Date	8/2/2016	11/8/2017	11/8/2017	11/8/2017	
Sample Round					
Filtered	Total	Total	Total	Total	
TIC SVOCs (µg/l)					
Total TICs	500	724 JN	NA	NA	NA

Footnote:

1) Number of Analyses is the number of detected and non-detected results excluding rejected results. Sample duplicate pairs have not been averaged.

2) NLE = no limit established.

3) NA = Not Applicable

4) µg/l = micrograms per Liter

5) Bold chemical detection

6) SS = Site Specific action level, see "Specific Chemical Class (or Parameter)" footnote for details.

7) Chemical result qualifiers are assigned by the laboratory and are evaluated and modified (if necessary) during the data validation.

[blank] = detect, i.e. detected chemical result value.

U = non-detect, i.e. not detected at or above this value.

JN = Tentatively identified compound, estimated concentration.

J = estimated detected value due to a concentration below the reporting limit or due to discrepancies in meeting certain analyte-specific quality control.

UJ = The compound was not detected; however, the results is estimated because of discrepancies in meeting certain analyte-specific QC criteria.

8) Specific Chemical Classes (or Parameters) comments or notes regarding how data is displayed, compared to Action Levels, or represented in this table.

9) Chemical results greater than or equal to the action level (depending on criteria) are highlighted based on the Criteria that are present.

- Cell Shade values represent a result that is above the NJ Ground Water Quality Criteria

###

NJDEP Interim Specific GWQC values are presented for the NJ GWQS where there is not a Specific Ground Water Quality Criteria. A full list of compounds is available at (http://www.nj.gov/dep/wms/bwqsa/gwqs_interim_criteria_table.htm).

NJDEP Interim Generic GWQC values are presented for the NJ GWQS where there is not a XXXXX or a NJDEP Interim Specific GWQC. Available at (http://www.nj.gov/dep/wms/bwqsa/gwqs_interim_criteria_table.htm).

10) Criteria action level source document and web address.

- The NJ Ground Water Quality Criteria refers to the NJDEP Groundwater Quality Standards - Adopted July 22, 2010

<http://www.state.nj.us/dep/wms/bwqsa/docs/njac79C.pdf>

**TABLE 3
GROUND WATER SAMPLING RESULTS for PERMANENT WELLS -
COMPARISON TO NJDEP GROUND WATER QUALITY CRITERIA
SITE AREA 800, FORT MONMOUTH, NEW JERSEY**

Loc ID	NJ Ground Water Quality Criteria	PAR-56-800-20-MW-01		PAR-56-800-20-MW-02	
Sample ID		PAR-56-800-20-GW-MW-01-14.5		PAR-56-800-20-GW-MW-02-15	
Sample Date		1/17/2018		1/17/2018	
Sample Round					
Filtered		Total		Total	
Volatile Organic Compounds (µg/l)					
1,1,1,2-Tetrachloroethane	1	< 0.75	UJ	< 0.75	
1,1,1-Trichloroethane	30	< 0.75	UJ	< 0.75	
1,1,2,2-Tetrachloroethane	1	< 0.75	UJ	< 0.75	
1,1,2-Trichloroethane	3	< 0.75	UJ	< 0.75	
1,1-Dichloroethane	50	< 0.75	UJ	< 0.75	
1,1-Dichloroethene	1	< 0.75	UJ	< 0.75	
1,1-Dichloropropene	100	< 0.75	UJ	< 0.75	
1,2,3-Trichlorobenzene	100	< 0.75	UJ	< 0.75	
1,2,3-Trichloropropane	0.03	< 2.5	UJ	< 2.5	
1,2,4-Trichlorobenzene	9	< 0.75	UJ	< 0.75	
1,2,4-Trimethylbenzene	100	< 0.75	UJ	< 0.75	
1,2-Dibromo-3-chloropropane	0.02	< 2.5	UJ	< 2.5	
1,2-Dibromoethane	0.03	< 0.75	UJ	< 0.75	
1,2-Dichlorobenzene	600	< 0.75	UJ	< 0.75	
1,2-Dichloroethane	2	< 0.75	UJ	< 0.75	
1,2-Dichloropropane	1	< 0.75	UJ	< 0.75	
1,3,5-Trimethylbenzene	100	< 0.75	UJ	< 0.75	
1,3-Dichlorobenzene	600	< 0.75	UJ	< 0.75	
1,3-Dichloropropane	100	< 0.75	UJ	< 0.75	
1,4-Dichlorobenzene	75	< 0.75	UJ	< 0.75	
2,2-Dichloropropane	100	< 0.75	UJ	< 0.75	
2-Chlorotoluene	100	< 0.75	UJ	< 0.75	
Acetone	6,000	< 3.8	UJ	3.9 J	
Benzene	1	< 0.75	UJ	< 0.75	
Bromobenzene	100	< 0.75	UJ	< 0.75	
Bromochloromethane	100	< 0.75	UJ	< 0.75	
Bromodichloromethane	1	< 0.75	UJ	< 0.75	
Bromoform	4	< 0.75	UJ	< 0.75	
Carbon tetrachloride	1	< 0.75	UJ	< 0.75	
Chlorobenzene	50	< 0.75	UJ	< 0.75	
Chlorodibromomethane	1	< 0.75	UJ	< 0.75	
Chloroethane	5	< 0.75	UJ	< 0.75	
Chloroform	70	< 0.75	UJ	< 0.75	
Cis-1,2-Dichloroethene	70	< 0.75	UJ	< 0.75	
Cis-1,3-Dichloropropene	1	< 0.75	UJ	< 0.75	
Cymene	100	< 0.75	UJ	< 0.75	
Dichlorodifluoromethane	1,000	< 0.75	UJ	< 0.75	
Ethyl benzene	700	< 0.75	UJ	< 0.75	
Hexachlorobutadiene	1	< 3.8	UJ	< 3.8	
Isopropylbenzene	700	< 0.75	UJ	< 0.75	
Meta/Para Xylene	1,000	< 1.5	UJ	< 1.5	
Methyl bromide	10	< 0.75	UJ	< 0.75	
Methyl butyl ketone	300	< 3.8	UJ	< 3.8	
Methyl chloride	100	< 0.75	UJ	< 0.75	
Methyl ethyl ketone	300	< 3.8	UJ	< 3.8	
Methyl isobutyl ketone	100	< 3.8	UJ	< 3.8	
Methyl Tertbutyl Ether	70	< 0.75	UJ	< 0.75	
Methylene chloride	3	< 0.75	UJ	< 0.75	
Naphthalene	300	< 0.75	UJ	< 0.75	
n-Butylbenzene	100	< 0.75	UJ	< 0.75	
Ortho Xylene	1,000	< 0.75	UJ	< 0.75	
p-Chlorotoluene	100	< 0.75	UJ	< 0.75	

Loc ID	NJ Ground Water Quality Criteria	PAR-56-800-20-MW-01		PAR-56-800-20-MW-02	
Sample ID		PAR-56-800-20-GW-MW-01-14.5		PAR-56-800-20-GW-MW-02-15	
Sample Date		1/17/2018		1/17/2018	
Sample Round					
Filtered		Total		Total	
Volatile Organic Compounds (µg/l)					
Propylbenzene	100	< 0.75	UJ	< 0.75	
sec-Butylbenzene	100	< 0.75	UJ	< 0.75	
Styrene	100	< 0.75	UJ	< 0.75	
Tert Butyl Alcohol	100	< 12.5	UJ	< 12.5	
tert-Butylbenzene	100	< 0.75	UJ	< 0.75	
Tetrachloroethene	1	< 0.75	UJ	< 0.75	
Toluene	600	< 0.75	UJ	< 0.75	
Total Xylenes	1,000	< 2.3	UJ	< 2.3	
Trans-1,2-Dichloroethene	100	< 0.75	UJ	< 0.75	
Trans-1,3-Dichloropropene	1	< 0.75	UJ	< 0.75	
Trichloroethene	1	< 0.75	UJ	< 0.75	
Trichlorofluoromethane	2,000	< 0.75	UJ	< 0.75	
Vinyl chloride	1	< 0.75	UJ	< 0.75	
TIC VOCs (µg/l)					
Total TICs	500		NA		NA
Semivolatile Organic Compounds (µg/l)					
1,2,4-Trichlorobenzene	9	< 0.94		< 0.95	
1,2-Dichlorobenzene	600	< 0.94		< 0.95	
1,2-Diphenylhydrazine	20	< 0.94		< 0.95	
1,3-Dichlorobenzene	600	< 0.94		< 0.95	
1,4-Dichlorobenzene	75	< 0.94		< 0.95	
2,4,5-Trichlorophenol	700	< 2.8		< 2.9	
2,4,6-Trichlorophenol	20	< 0.94		< 0.95	
2,4-Dichlorophenol	20	< 0.94		< 0.95	
2,4-Dimethylphenol	100	< 4.7		< 4.8	
2,4-Dinitrophenol	40	< 7.5		< 7.6	
2,4-Dinitrotoluene	10	< 0.94		< 0.95	
2,6-Dinitrotoluene	10	< 0.94		< 0.95	
2-Chloronaphthalene	600	< 0.94		< 0.95	
2-Chlorophenol	40	< 1.9		< 1.9	
2-Methylnaphthalene	30	< 0.94		< 0.95	
2-Methylphenol	100	< 0.94		< 0.95	
2-Nitroaniline	100	< 0.94		< 0.95	
2-Nitrophenol	100	< 1.9		< 1.9	
3,3'-Dichlorobenzidine	30	< 2.8		< 2.9	
3-Nitroaniline	100	< 1.9		< 1.9	
4,6-Dinitro-2-methylphenol	1	< 4.7		< 4.8	
4-Bromophenyl phenyl ether	100	< 0.94		< 0.95	
4-Chloro-3-methylphenol	100	< 0.94		< 0.95	
4-Chloroaniline	30	< 0.94		< 0.95	
4-Chlorophenyl phenyl ether	100	< 0.94		< 0.95	
4-Nitroaniline	5	< 0.94		< 0.95	
4-Nitrophenol	100	< 4.7		< 4.8	
Acenaphthene	400	< 0.94		< 0.95	
Acenaphthylene	100	< 0.94		< 0.95	
Anthracene	2,000	< 0.94		< 0.95	
Benzidine	20	< 28.2		< 28.6	
Benzo(a)anthracene	0.1	< 0.94		0.19 J	
Benzo(a)pyrene	0.1	< 0.94		< 0.95	
Benzo(b)fluoranthene	0.2	< 0.94		0.13 J	
Benzo(ghi)perylene	100	< 0.94		< 0.95	
Benzo(k)fluoranthene	0.5	< 0.94		< 0.95	
Benzyl alcohol	2,000	< 1.9		< 1.9	
Bis(2-Chloroethoxy)methane	100	< 0.94		< 0.95	
Bis(2-Chloroethyl)ether	7	< 0.94		< 0.95	
Bis(2-Chloroisopropyl)ether	300	< 0.94		< 0.95	
Bis(2-Ethylhexyl)phthalate	3	0.23 J		0.29 J	
Butyl benzyl phthalate	100	< 0.94		0.16 J	
Carbazole	100	< 0.94		< 0.95	
Chrysene	5	< 0.94		< 0.95	

Loc ID	NJ Ground Water Quality Criteria	PAR-56-800-20-MW-01		PAR-56-800-20-MW-02	
Sample ID		PAR-56-800-20-GW-MW-01-14.5		PAR-56-800-20-GW-MW-02-15	
Sample Date		1/17/2018		1/17/2018	
Sample Round					
Filtered		Total		Total	
Semivolatile Organic Compounds (µg/l)					
Cresol	NLE	< 0.94		< 0.95	
Dibenz(a,h)anthracene	0.3	< 0.94		< 0.95	
Dibenzofuran	100	< 0.94		< 0.95	
Diethyl phthalate	6,000	< 0.94		< 0.95	
Dimethyl phthalate	100	< 0.94		< 0.95	
Di-n-butylphthalate	700	< 0.94		0.17 J	
Di-n-octylphthalate	100	< 0.94		0.13 J	
Fluoranthene	300	< 0.94		< 0.95	
Fluorene	300	< 0.94		< 0.95	
Hexachlorobenzene	0.02	< 0.94		< 0.95	
Hexachlorobutadiene	1	< 0.94		< 0.95	
Hexachlorocyclopentadiene	40	< 1.9		< 1.9	
Hexachloroethane	7	< 0.94		< 0.95	
Indeno(1,2,3-cd)pyrene	0.2	< 0.94		< 0.95	
Isophorone	40	< 0.94		< 0.95	
Naphthalene	300	< 0.94		< 0.95	
Nitrobenzene	6	< 1.9		< 1.9	
N-Nitrosodimethylamine	0.8	< 1.9		< 1.9	
N-Nitroso-di-n-propylamine	10	< 0.94		< 0.95	
N-Nitrosodiphenylamine	10	< 1.9		< 1.9	
Pentachlorophenol	0.3	< 7.5		< 7.6	
Phenanthrene	100	< 0.94		< 0.95	
Phenol	2,000	< 0.94		< 0.95	
Pyrene	200	< 0.94		< 0.95	
TIC SVOCs (µg/l)					
Total TICs	500	6.3 JN		NA	

Footnote:

- Number of Analyses is the number of detected and non-detected results excluding rejected results. Sample duplicate pairs have not been averaged.
- NLE = no limit established.
- NA = Not Applicable
- µg/l = micrograms per Liter
- Bold chemical detection
- SS = Site Specific action level, see "Specific Chemical Class (or Parameter)" footnote for details.
- Chemical result qualifiers are assigned by the laboratory and are evaluated and modified (if necessary) during the data validation.

[blank] = detect, i.e. detected chemical result value.

U = non-detect, i.e. not detected at or above this value.

JN = Tentatively identified compound, estimated concentration.

J = estimated detected value due to a concentration below the reporting limit or due to discrepancies in meeting certain analyte-specific quality control.

UJ = The compound was not detected; however, the results is estimated because of discrepancies in meeting certain analyte-specific QC criteria.

- Specific Chemical Classes (or Parameters) comments or notes regarding how data is displayed, compared to Action Levels, or represented in this table.

- Chemical results greater than or equal to the action level (depending on criteria) are highlighted based on the Criteria that are present.

- Cell Shade values represent a result that is above the NJ Ground Water Quality Criteria

###

NJDEP Interim Specific GWQC values are presented for the NJ GWQS where there is not a Specific Ground Water Quality Criteria. A full list of compounds is available at (http://www.nj.gov/dep/wms/bwqsa/gwqs_interim_criteria_table.htm).

NJDEP Interim Generic GWQC values are presented for the NJ GWQS where there is not a XXXXX or a NJDEP Interim Specific GWQC. Available at (http://www.nj.gov/dep/wms/bwqsa/gwqs_interim_criteria_table.htm).

- Criteria action level source document and web address.

- The NJ Ground Water Quality Criteria refers to the NJDEP Groundwater Quality Standards - Adopted July 22, 2010

<http://www.state.nj.us/dep/wms/bwqsa/docs/njac79C.pdf>

Attachment A

Regulatory Correspondence:

1. New Jersey Department of Environmental Protection (NJDEP). 2017. Letter to the Army, *Supplemental Unregulated Heating Oil Tank (UHOT) Work Plan, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. October 13.
2. Department of the Army. 2017. *Supplemental Unregulated Heating Oil Tank (UHOT) Work Plan, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. August 15.
3. New Jersey Department of Environmental Protection (NJDEP). 2017. Letter to the Army, RE: *Request for No Further Action at Multiple 800 Area Underground Storage Tanks, Site Investigation Report Addendum, Fort Monmouth, Oceanport, Monmouth County*. March 16.
4. Department of the Army. 2017. *Request for No Further Action at Multiple 800 Area Underground Storage Tanks, Site Investigation Report Addendum, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. January 23.
5. New Jersey Department of Environmental Protection (NJDEP). 2016. Letter to the Army, RE: *800 Area Work Plan Addendum and Response to NJDEP's November 10, 2015 Comments on the June 2015 No Further Action Request, Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 & 56, Fort Monmouth & 800 Area Work Plan Addendum for Former UST Sites (March 2016), Fort Monmouth, Oceanport, Monmouth County*. April 4.
6. Department of the Army. 2016. Letter to the Army, *800 Area Work Plan Addendum and Response to NJDEP's November 10, 2015 Comments on the June 2015 No Further Action Request, Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 & 56, Fort Monmouth, Oceanport, Monmouth County*. March 3.
7. New Jersey Department of Environmental Protection (NJDEP). 2015. Letter to the Army, RE: *Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 & 56, Fort Monmouth, Oceanport, Monmouth County*. November 10.
8. Department of the Army. 2015. *No Further Action Request, Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 and 56, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. June 12.



State of New Jersey

CHRIS CHRISTIE
Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Northern Field Operations
7 Ridgedale Avenue
Cedar Knolls, NJ 07927
Phone #: 973-631-6401
Fax #: 973-656-4440

BOB MARTIN
Commissioner

KIM GUADAGNO
Lt. Governor

October 13, 2017

Mr. William Colvin
BRAC Environmental Coordinator
OACSIM – U.S. Army Fort Monmouth
P. O. Box 148
Oceanport, NJ 07757

Re: Supplemental Unregulated Heating Oil Tank Work Plan
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin,

The New Jersey Department of Environmental Protection (Department) has completed review of the Supplemental Unregulated Heating Oil Tank Work Plan (UST Workplan). The UST Workplan included proposal for further investigation(s) at various Underground Storage Tank (UST) locations. The Department offers the following comments:

- **UST 142B, UST 202A, UST 202D** – The proposal to install monitor wells (MWs) is approved. Please ensure that all approved sampling methodologies are utilized. Please also document field observations, including the presence of free product and/or sheen in any of the MWs. Please note that the proposal to install additional MW, as needed, is also approved as this may assist in further delineating the extent of ground water contamination.
- **UST 211** – Further investigation is approved as proposed. However, the Department recommends installing one temporary well south of boring locations SCREEN 5 and SCREEN 6.
- **UST 228B** – Further investigation is approved as proposed. Based on the findings from previous investigation(s) and subsequent sampling results (soils and ground water), the Department may recommend removing the UST.
- **UST 444** – The installation of borings (6), temporary wells (3) and permanent monitor wells (3) is approved. However, as other USTs were present in the area, please ensure that results from UST 444 and other USTs' results are not co-mingled.
- **UST 490** – Further investigation is approved as proposed. However, please indicate if any previous soil remediation in the form of soil removal was performed when this UST was removed in 1990 or thereafter.
- **UST 750J, UST 800-12, UST 800-20, UST 884, UST 906A and UST 3035** – Further investigations are approved as proposed at these locations.

Please submit all results of the findings to my attention for review. If possible, please have each UST findings, tables, figures and maps individually prepared. Thank you and please feel free to contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to be 'A.J. Joshi', enclosed within a hand-drawn circle.

A.J. Joshi

C: James Moore, USACE
Rich Harrison, FMERA
Joe Fallon, FMERA
Joe Pearson, Calibre
File



DEPARTMENT OF THE ARMY

OFFICE OF ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
U.S. ARMY FORT MONMOUTH
P.O. 148
OCEANPORT, NEW JERSEY 07757

15 August 2017

Mr. Ashish Joshi
New Jersey Department of Environmental Protection
Northern Bureau of Field Operations
7 Ridgedale Avenue
Cedar Knolls, NJ 07927

**SUBJECT: Supplemental Unregulated Heating Oil Tank (UHOT) Work Plan
Fort Monmouth, New Jersey
PI G000000032**

Figures:

- Figure 1 – UHOT Locations
- Figure 2 – UST 142B Sample Location
- Figure 3 – UST 202A and UST 202D Sample Locations
- Figure 4 – UST 211 Sample Locations
- Figure 5 – UST 228B Sample Location
- Figure 6 – UST 444 Sample Locations
- Figure 7 – UST 490 Sample Locations
- Figure 8 – UST 750J Sample Location
- Figure 9 – UST 800-12 Sample Locations
- Figure 10 – UST 800-20 Sample Locations
- Figure 11 – UST 884 Sample Locations
- Figure 12 – UST 906A Soil Sample Locations
- Figure 13 – UST 906A Groundwater Sample Locations
- Figure 14 – UST 3035 Sample Locations

Tables:

- Table 1 – Sampling Summary
- Table 2 – UST 906A Soil Sample Results
- Table 3 – UST 906A Groundwater Sample Results

Attachments:

- A. Groundwater Flow Direction Maps

Dear Mr. Joshi:

The U.S. Army Fort Monmouth (FTMM) Team has prepared this Work Plan to describe the proposed sampling and analyses activities to support environmental investigations at select unregulated heating oil tanks (UHOTs; also referred to as underground storage tanks [USTs] in this submittal) at FTMM (Figure 1).

The UHOTs described in this Work Plan are being evaluated in accordance with the New Jersey Administrative Code (NJAC) 7:26E *Technical Requirements for Site Remediation*. Most of these UHOTs require a remedial investigation (RI) in accordance with NJAC 7:26E-4.3 for delineation of an identified release of fuel oil constituents in groundwater. However, additional USTs have been included in this Work Plan that only require site investigation (SI) soil or groundwater sampling (NJAC 7:26E-3.4 or -3.5) to determine if a release has occurred, as designated below:

- UST 142B (SI)
- UST 202A (SI)
- UST 202D (RI)
- UST 211 (RI)
- UST 228B (SI)
- UST 444 (RI)
- UST 490 (RI)
- UST 750J (SI)
- UST 800-12 (RI)
- UST 800-20 (RI)
- UST 884 (RI)
- UST 906A (RI)
- UST 3035 (SI)

Specific data needs and proposed sampling at each UHOT site are described in the subsections below. Groundwater flow directions in the area where delineation in groundwater is required are generally not well established due to the distances to other nearby monitor wells. Therefore, regional groundwater flow directions from previous documents (Attachment A) were used as a basis for initial planning of groundwater sampling at each site.

The proposed groundwater assessment strategy includes a combination of field screening and groundwater sampling and analysis to delineate the groundwater plume. For a typical UHOT site without any previous plume assessment, Geoprobe soil borings will be placed in a ring around the former tank site, and each boring will be advanced to a depth below the shallow groundwater. Field screening using a photoionization detector (PID) and visual observation of the Geoprobe soil cores will be used to identify and assess areas impacted by fuel oil downgradient of the source area. Previous Geoprobe assessments at FTMM have successfully identified fuel oil contamination in areas downgradient of former UHOTs using these field screening techniques. The field screening results will be used to verify the contaminant migration direction (and by implication, the groundwater flow direction) for each UHOT site. Temporary groundwater monitoring wells will then be placed within and outside of the plume at each tank site using a Geoprobe, and the groundwater will be sampled to verify the nature and extent of groundwater contamination. Following receipt of analytical data from the temporary wells, permanent monitoring wells will be installed to establish a monitoring network with a minimum of three wells at each site: a source area well near the former tank site, a well downgradient of the source but within the plume, and a downgradient sentry well beyond the plume. Select existing monitoring wells will also be used for water level measurements to complement the monitoring network. All new permanent monitoring wells and the existing monitoring wells to be used for water level measurements will be surveyed by a New Jersey-licensed surveyor in accordance with the Sampling and Analysis Plan (SAP; Reference 23).

Sampling and analytical procedures will follow the protocols established for previous FTMM Work Plan submittals (Reference 24). All Site personnel will be required to read, understand, and comply with the safety guidelines in the Accident Prevention Plan (APP) including the Site Health and Safety Plan (SHASP), which is included as Appendix A of the APP (Reference 25). The detailed field procedures to be used for the activities described in this sampling plan are described in the SAP (Reference 23). Please let me know if you need these or any other documents referred to in this Work Plan to be sent to you.

Specific sampling and analytical requirements are summarized in Table 1, and are described for each UHOT in the subsections below.

1. UST 142B

UST 142B was a steel 550-gallon No. 2 fuel oil UST that was removed in July 1994, along with approximately 30 cubic yards of contaminated soil, as presented in Attachment H of *USTs Within ECP Parcel 79* (Reference 2). Subsequently, NJDEP required a groundwater investigation to be performed (Reference 13); a temporary well was installed, sampled and abandoned in August 2016. Multiple polynuclear aromatic hydrocarbons (PAHs) were detected in the groundwater sample, which was attributed to sample turbidity rather than a release of fuel oil to groundwater (as reported in Reference 10). NJDEP (Reference 22) then recommended resampling using a method to reduce turbidity due to the high concentrations for PAHs detected.

To address this data need, a 2-inch diameter permanent monitoring well will be installed at the former UST 142B tank location, as shown on Figure 2. This approach is expected to result in a low-turbidity groundwater sample without PAH exceedances. The well will be installed within a Geoprobe boring and will be completed with a 10-foot well screen to approximately 7 feet (ft) below the water table (estimated at approximately 4 ft below ground surface [bgs]). The well will be developed to meet the criteria specified in NJDEP's most recent *Field Sampling Procedures Manual*. Low-flow sampling methods will be used to sample this well and the sample will be analyzed for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) in accordance with the requirements for No. 2 fuel oil in Table 2-1 of the NJAC 7:26E *Technical Requirements for Site Remediation*. The Field Geologist will note any indications of fill within the soil column such as cinders, coal, or other debris. A letter report will be prepared for UST 142B that either requests a No Further Action (NFA) determination or recommends additional investigation or action, as warranted from the analytical data.

2. UST 202A

UST 202A was a fiberglass 1,000-gallon heating oil UST that was removed in October 2001, along with an unspecified quantity of contaminated soil, as presented in Attachment J of *USTs Within ECP Parcel 79* (Reference 2). NJDEP (Reference 13) subsequently required a groundwater investigation for the UST 202A and UST 202D area. One temporary well and two existing permanent wells were sampled in May and August 2016 (Reference 10). NJDEP then recommended installation of a permanent well nearby to assess UST 202D (Reference 22); at the same time, NFA was not approved for UST 202A. Additional data are needed to delineate groundwater contamination associated with UST 202A and to delineate groundwater contamination at nearby UST 202D (described in Section 3 below).

To address the UST 202A data need, one temporary monitoring well will be installed at the former UST 202A tank location, as shown on Figure 3. The well will be installed within a Geoprobe boring and will be completed with a 5-foot well screen to approximately 4 ft below the water table (estimated at approximately 2 ft bgs). This well will be sampled and the sample will be analyzed for VOCs and SVOCs in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E. The Army may also install and sample additional permanent wells based on the temporary well results. A letter report will be prepared for UST 202A that either requests a No Further Action (NFA) determination or recommends additional investigation or action.

3. UST 202D

UST 202D was a steel 500-gallon heating oil UST that was removed in May 2005 along with approximately 20 cubic yards of contaminated soil (Attachment L of Reference 2). A temporary well was sampled at the former UST 202D location in June 2011; benzene (1.61 µg/L) and 2-methylnaphthalene (109 to 233 µg/L) were detected at concentrations greater than NJDEP Ground Water Quality Criteria (GWQC). NJDEP subsequently required a groundwater investigation for UST 202D (Reference 13). One temporary well and two existing permanent wells were sampled in May and August 2016 (Reference 10). NJDEP then recommended installation of a permanent well to assess UST 202D with low-flow sampling and analysis for VOCs and SVOCs (Reference 22).

To address this data need, one permanent monitoring well and at least three temporary wells will be installed at the former UST 202D tank location, as shown on Figure 3. Recent temporary well results (Reference 10) suggest that fuel oil constituents have not migrated more than approximately 50 ft downgradient of the former tank location (Figure 3). Therefore, two additional downgradient temporary wells and one field screening boring will be installed for verification at offset locations approximately 50 feet downgradient of the former tank location to verify that the plume was not missed. A third temporary well will be installed at the former UST 202A location as described in Section 2.0 above. These temporary wells will be installed within a Geoprobe boring and will typically be completed with a 5-foot well screen to approximately 4 ft below the water table (estimated to be 2 ft bgs). Samples will be collected from the temporary wells for VOCs and SVOCs analyses, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E. Additional temporary wells may be installed as needed based on the groundwater sampling described above.

It is anticipated that existing well M16MW02 will be utilized as a downgradient sentry monitor well for the UST 202D site. New well 202MW02 will be developed. Both new well 202MW02 and existing well M16MW02 will be sampled using low-flow methods; the samples will be analyzed for VOCs and SVOCs in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Water level measurements will be collected from monitoring wells 202MW01, 202MW02, M16MW01, and M16MW02 (Figure 3) to determine the local groundwater flow direction. It is anticipated that a remedial investigation report will be prepared for UST 202D.

4. UST 211

UST 211 was a fiberglass 2000-gallon No. 2 fuel oil UST that was removed in November 2001. As presented in Attachment F.1 of Reference 8, one closure soil sample contained 3,968 mg/kg Total Petroleum Hydrocarbons (TPH). A temporary well was sampled at the former UST 211 location in August 2016; multiple analytes were detected at concentrations greater than the GWQCs including 1,2,4-trimethylbenzene (543 $\mu\text{g/L}$), benzene (2.8 $\mu\text{g/L}$), naphthalene (1,450 $\mu\text{g/L}$), 2-methylnaphthalene (6,680 $\mu\text{g/L}$), total VOC Tentatively Identified Compounds (TICs; 1,302 $\mu\text{g/L}$) and total SVOC TICs (14,322 $\mu\text{g/L}$) (Attachment D of Reference 8). NJDEP stated that additional remedial efforts were required for this site (Reference 19). Additional data are needed to delineate groundwater contamination at UST 211.

To address this data need, multiple field screening borings, temporary monitoring wells and permanent monitoring wells will be installed near the former UST 211 tank location, as shown on Figure 4. Field screening Geoprobe borings SCREEN1 through SCREEN6 (Figure 4) will be advanced at locations around the former UST 211 location to provide field verification of the groundwater flow direction, which is assumed to be towards the north-northwest based on regional groundwater maps (Attachment A). These borings will be advanced past the water table, which is assumed to be approximately 12 ft bgs based on previous drilling at PAR-72-211-TMW-01. The field screening borings will be logged visually and with a PID, which has proven useful for identifying fuel oil contamination at FTMM. The field results will be used to validate the locations for subsequent temporary wells to assist with delineating the groundwater plume.

A total of four additional temporary monitor wells are proposed at UST 211. A line of three temporary monitor wells (TMW-02 through TMW-04) will be installed along Russel Avenue (approximately 60 ft downgradient of the tank) to verify the direction and lateral boundaries of the plume. A fourth temporary monitor well (TMW-05) will be installed further downgradient to establish the downgradient extent of the plume prior to installing a downgradient permanent sentry well. As with the field screening borings, the borings for temporary wells will be logged visually and with a PID to estimate the extent of the plume in the field. Additional field screening borings (like SCREEN7 on Figure 4) may be used to determine the downgradient extent of the plume. The temporary wells will be installed within Geoprobe borings and will typically be completed with a 5-foot well screen to approximately 4 ft below the water table (estimated at approximately 12 ft bgs). Samples will be collected from each temporary well and analyzed for VOCs and SVOCs in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Based on the analytical results of the temporary well samples, three permanent monitoring wells will be installed for groundwater monitoring: one at the source area (MW-01); one within the plume (MW-02); and one downgradient sentry location (MW-03). The new wells will be developed and sampled using low-flow methods, and the groundwater samples will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Water level measurements will be collected from the three new monitoring wells, and from nearby wells 200MW01 (located south of Building 216; see Attachment A), 200MW06 (located north of Building 228; Figure 5), and B5MW05B (located southeast of Building 261), to determine the local groundwater flow direction. It is anticipated that a remedial investigation report will be prepared for UST 211.

5. UST 228B

UST 228B is a steel 1,000-gallon No. 2 fuel oil UST that was partially uncovered in December 2010, and then re-buried and left in place. Therefore, UST 228B has not been administratively closed. The Army has conducted soil sampling along the tank to determine if a release has occurred at UST 228B, and the results were described in Attachment G.4 of Reference 8. One soil sample from the 7 to 7.5 foot interval of boring PAR-72-228-SB-03 had a 2-methylnaphthalene concentration of 23.9 mg/kg which exceeded the NJDEP Impact to Ground Water (IGW) screening level, but not the Residential Direct Contact Soil Remediation Standard (RDCSRS). Synthetic Precipitation Leachate Procedure (SPLP) analysis for 2-methylnaphthalene was not performed (as prescribed by NJDEP guidance) on this soil sample due to exceedance of holding times. However, a temporary well located about 10 ft downgradient of boring PAR-72-228-SB-03 was sampled and 2-methylnaphthalene was notably absent in this sample. NJDEP agreed that additional remedial efforts were required (Reference 19). Further evaluation of the soil boring log for PAR-72-228-SB-03 indicates that groundwater was encountered at approximately 7 ft bgs, and therefore this sample may have been from the saturated zone and, if so, IGW screening levels would not apply, and there would be no soil exceedances at this site. Additional data, as described below, are needed to assess the potential for unsaturated soil to exceed the SPLP criteria for 2-methylnaphthalene.

To address this data need, one Geoprobe soil boring (SB-04) will be advanced at the location of the previous boring PAR-72-228-SB-03 where the IGW screening level for 2-methylnaphthalene was exceeded (Figure 5). An unsaturated soil sample (from above the water table) will be collected from approximately 7 to 7.5 ft bgs for 2-methylnaphthalene analysis using the SPLP procedure. A letter report will be prepared for UST 228B that reports the results of this additional investigation.

6. UST 444

UST 444 was a steel 1,000-gallon No. 2 fuel oil UST that was removed in January 2010; an unreported quantity of contaminated soil was removed the following month (Attachment U of Reference 2). NJDEP required a groundwater investigation for the UST 444 area (Reference 13). A temporary well was sampled at the former UST 444 location in August 2016; multiple analytes were detected at concentrations greater than the GWQCs, including benzene (1.7 J $\mu\text{g/L}$), 2-methylnaphthalene (30.6 J $\mu\text{g/L}$), and total SVOC TICs (1,758 $\mu\text{g/L}$) (Reference 10). NJDEP commented that further investigation was necessary for this site (Reference 22). Additional data are needed to delineate groundwater contamination at UST 444.

To address this data need, multiple field screening borings, temporary monitoring wells and permanent monitoring wells will be installed around the former UST 444 tank location, as shown on Figure 6. Field screening Geoprobe borings SCREEN1 through SCREEN6 (Figure 6) will be advanced at locations around the former UST 444 location to determine the groundwater flow direction which is assumed to be towards the north based on regional groundwater maps (Attachment A). These borings will be advanced past the water table, which is assumed to be at approximately 6 ft bgs based on previous drilling at PAR-79-MP-TMW-02. The field screening borings will be logged visually and with a PID, which has proven useful for identifying fuel oil contamination at FTMM. The field results will be used to verify the field locations for subsequent temporary wells to assist with delineating the groundwater plume.

A total of three additional temporary monitor wells are proposed at UST 444. A line of two additional temporary monitor wells (TMW-01 and TMW-02) will be installed approximately 100 ft downgradient of the tank to verify the direction and lateral boundaries of the plume. Results from a temporary well (PAR-79-MP-TMW03) installed in August 2016 for another former UST investigation will be used to complete this line of temporary wells (there were no exceedances of GWQC in this well). A third temporary monitor well (TMW-03) will be installed approximately 100 feet farther downgradient to establish the downgradient extent of the plume prior to installing a permanent downgradient sentry well. As with the field screening borings, the borings for temporary wells will be logged visually and with a PID to estimate the extent of the plume in the field. Additional field screening borings may be used to determine the downgradient extent of the plume. The temporary wells will be installed within Geoprobe borings and will be completed with a 5-foot well screen to approximately 4 feet below the water table (estimated at approximately 6 ft bgs). Each temporary well will be sampled and the groundwater samples will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Three new permanent monitoring wells will be installed for groundwater monitoring at the source area (MW-01), within the plume (MW-02), and at a downgradient sentry location (MW-03). These wells will be installed after the analytical data for the temporary wells have been evaluated; therefore the actual locations may be adjusted from those shown on Figure 6 based on these data. The new wells will be developed and sampled using low-flow methods, and the groundwater samples will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Water level measurements will be collected from the three new monitoring wells and from nearby well 430MW-1 (Figure 6) to determine the local groundwater flow direction. It is anticipated that a remedial investigation report will be prepared for UST 444.

7. UST 490

UST 490 was a steel 1,000-gallon No. 2 fuel oil UST that was removed in May 1990 (Attachment CC of Reference 2). NJDEP subsequently required additional characterization of groundwater contamination for the UST 490 area (Reference 13). Multiple rounds of Geoprobe soil sampling performed from 2005 through 2016 verified the presence of petroleum contaminated soils near the former UST location. Groundwater was sampled in August 2016 from a temporary well (PAR-79-490-TMW-03) located downgradient of the former UST location and just south of Building 490; 2-methylnaphthalene (63.5 µg/L) and total SVOC TICs (1,323 µg/L) were detected at concentrations greater than the GWQCs (Reference 10). NJDEP commented that additional groundwater investigations must also include analyses for PAHs (Reference 22). As described below, additional data are needed to estimate the nature and extent of groundwater contamination at UST 490.

Previous sampling results have been used to select additional field screening borings, temporary monitoring wells and permanent monitoring wells which will be installed downgradient of the former UST 490 location (Figure 7). Field screening Geoprobe borings will be advanced at two locations (SCREEN1 and SCREEN2; Figure 7) south of Building 490 to determine the groundwater flow direction which is assumed to be towards the southeast based on regional groundwater maps (Attachment A). The field screening borings will be advanced past the water table, which is assumed to be at approximately 3 ft bgs based on previous drilling at PAR-79-490-TMW-03. The field

screening borings will be logged visually and with a PID, which has proven useful for identifying fuel oil contamination at FTMM. The field results will be used to select the field locations of temporary wells to be installed to delineate the groundwater plume.

A total of four additional temporary monitor wells are proposed at UST 490. Two temporary monitor wells (TMW-04 and TMW-05) will be installed approximately 50 ft from the previous PAR-79-490-TMW-03 location to locate the lateral (cross-gradient) boundaries of the plume. Two temporary monitor wells (TMW-06 and TMW-07) will be installed approximately 70 and 120 ft farther downgradient from Building 490 to establish the downgradient extent of the plume, prior to installing a permanent downgradient sentry well. As with the field screening borings, the borings for temporary wells will be logged visually and with a PID to estimate the extent of the plume in the field. Additional field screening borings may be used to determine the downgradient extent of the plume. The temporary wells will be installed within Geoprobe borings and will typically be completed with a 5-ft well screen to approximately 4 ft below the water table (estimated at approximately 3 ft bgs). Samples will be collected from each temporary well for VOC and SVOC analyses, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Existing well 490MW01 will be maintained as a source area well at the former UST 490 location. Two new permanent monitoring wells will be installed for groundwater monitoring within the plume (MW-02) and at a downgradient sentry location (MW-03). These wells will be installed after the analytical data for the temporary wells have been evaluated; therefore the actual locations may be adjusted from those shown on Figure 7. The two new wells will be developed. These two new wells and existing well 490MW01 will be sampled using low-flow methods and the groundwater samples will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Water level measurements will be collected from the three new monitoring wells, from the new well at former UST 142B (Figure 2), and from existing well M16MW01 (Figure 3) to determine the local groundwater flow direction. It is anticipated that a remedial investigation report will be prepared for UST 490.

8. UST 750J

UST 750J was a steel 1,000-gallon heating oil UST that was removed in August 2009, along with approximately 24 cubic yards of contaminated soil (Attachment M of Reference 6). NJDEP commented that a groundwater investigation was warranted (Reference 21).

One temporary monitoring well (TMW-01) will be installed at the former UST 750J tank location (Figure 8). The well will be installed within a Geoprobe boring and will be completed with a 5 foot well screen to approximately 4 ft below the water table (approximately 6.5 ft bgs). A sample from this well will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E. A letter report will be prepared for UST 750J that either requests a NFA determination or recommends additional investigation or action.

9. UST 800-12

UST 800-12 was a steel 1,000-gallon No. 2 fuel oil UST located in the parking lot of the former First Atlantic Credit Union (Building 1006). This UST was removed in May 2003 along with

approximately 18 cubic yards of contaminated soil (Attachment J of Reference 3). NJDEP commented that a groundwater investigation for the UST 800-12 area was necessary (Reference 15). Temporary well ARE-800-TMW-07 was installed and sampled at the former UST 800-12 location in August 2016; 2-methylnaphthalene (148 µg/L) and total SVOC TICs (510 µg/L) were detected at concentrations greater than the GWQCs (Reference 9). Based on these groundwater results, NJDEP (Reference 20) commented that further groundwater investigation was necessary. Further delineation of groundwater contamination at UST 800-12 will be performed as described below.

Multiple field screening borings, temporary monitoring wells and permanent monitoring wells will be installed around the former UST 800-12 tank location (Figure 9). Field screening Geoprobe borings SCREEN1 through SCREEN6 (Figure 9) will be advanced at locations around the former UST 800-12 location to determine the local groundwater flow direction, which is assumed to be towards the north-northwest based on regional groundwater maps (Attachment A). These borings will be advanced past the water table, which is assumed to be approximately 8.5 ft bgs based on previous drilling at ARE-800-TMW-07 (Reference 9). The field screening borings will be logged visually and the soils will be monitored with a PID which has proven useful for identifying fuel oil contamination at FTMM. The field results will be used to select the field locations for temporary wells to assist with delineating the groundwater plume.

A total of four temporary monitor wells are proposed at UST 800-12. A line of three temporary monitor wells (TMW-01 through TMW-03) will be installed approximately 80 ft downgradient of the location of the former tank to determine the direction and lateral boundaries of the plume. A fourth temporary monitor well (TMW-04) will be installed approximately 80 ft farther downgradient to establish the downgradient extent of the plume; this temporary well will be installed and sampled prior to installing a permanent downgradient sentry well. As with the field screening borings, the borings for temporary wells will be logged visually and with a PID to estimate the extent of the plume in the field. Additional field screening borings may be used to determine the downgradient extent of the plume. The temporary wells will be installed within Geoprobe borings and will typically be completed with a 5 foot well screen to approximately 4 ft below the water table (approximately 8.5 ft bgs). Each temporary well will be sampled and the groundwater samples will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Three new permanent monitoring wells will be installed to monitor groundwater at the source area (MW-01), within the plume (MW-02), and at a downgradient sentry location (MW-03). These wells will be installed after the analytical data for the temporary wells have been evaluated; the actual locations may be adjusted from those shown on Figure 9 based on these data. The new permanent wells will be developed and sampled using low-flow methods. The groundwater samples will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Water level measurements will be collected from the three new monitoring wells and from nearby existing wells 812MW05 and 812MW13 (Figure 2 of Attachment A) to determine the local groundwater flow direction. It is anticipated that a remedial investigation report will be prepared for UST 800-12.

10. UST 800-20

UST 800-20 was a steel 1,000-gallon No. 2 fuel oil UST that was removed in July 2003 along with approximately 80 cubic yards of contaminated soil (Attachment O of Reference 3). NJDEP commented that a groundwater investigation for the UST 800-20 area was necessary (Reference 15). A temporary well was sampled at the former UST 800-20 location in August 2016; 1,1,2-trichloroethane (5.5 µg/L), 2-methylnaphthalene (41 µg/L) and total SVOC TICs (724 µg/L) were detected at concentrations greater than the GWQCs (Reference 9). Based on these groundwater results, NJDEP commented that additional groundwater investigation was necessary for this site (Reference 20). Further delineation of groundwater contamination at UST 800-20 will be performed as described below.

Multiple field screening borings, temporary monitoring wells and permanent monitoring wells will be installed around the former UST 800-20 tank location (Figure 10). Field screening Geoprobe borings SCREEN1 through SCREEN6 (Figure 10) will be advanced at locations around the former UST 800-20 location to determine the local groundwater flow direction, which is assumed to be towards the north-northwest based on regional groundwater maps (Attachment A). These borings will be advanced past the water table which is assumed to be at approximately 7 ft bgs based on previous drilling at ARE-800-TMW-08 (Reference 9). The field screening borings will be logged visually and with a PID which has proven useful for identifying fuel oil contamination at FTMM. The field results will be used to select the locations for temporary wells to assist with delineating the groundwater plume.

A total of four additional temporary monitor wells are proposed at former UST 800-20. A line of three temporary monitor wells (TMW-01 through TMW-03) will be installed approximately 60 ft downgradient of the former tank to verify the direction and lateral boundaries of the plume. A fourth temporary monitor well (TMW-04) will be installed approximately 80 ft farther downgradient to establish the downgradient extent of the plume, prior to installing a downgradient permanent sentry well. As with the field screening borings, the borings for temporary wells will be logged visually and with a PID to estimate the extent of the plume in the field. Additional field screening borings may be used to determine the downgradient extent of the plume. The temporary wells will be installed within Geoprobe borings and will typically be completed with a 5 foot well screen approximately 4 ft below the water table (approximately 7 ft bgs). Samples from each temporary well will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Three new permanent monitoring wells will be installed to monitor groundwater at the source area (MW-01), within the plume (MW-02), and at a downgradient sentry location (MW-03). These wells will be installed after the analytical data for the temporary wells have been evaluated; the actual locations may be adjusted from those shown on Figure 10 based on these data. The new wells will be developed and sampled using low-flow methods. The groundwater samples will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Water level measurements will be collected from the three new monitoring wells, and from nearby existing wells 812MW05 and 812MW13 (Figure 2 of Attachment A), to determine the local

groundwater flow direction. It is anticipated that a remedial investigation report will be prepared for UST 800-20.

11. UST 884

UST 884 was a steel 1,000-gallon No. 2 fuel oil UST that was removed in October 2003 along with an unspecified amount of contaminated soil (Attachment U of the Reference 3). NJDEP commented that a groundwater investigation was necessary for the UST 884 area (Reference 15). A temporary well was sampled at the former UST 884 location in April 2016; 2-methylnaphthalene (150 µg/L) and total VOC TICs (981 µg/L) were detected at concentrations greater than the GWQCs (Reference 9). Based on these groundwater results, NJDEP commented additional groundwater investigation was necessary (Reference 20). Further delineation of groundwater contamination at UST 884 will be performed as described below.

Multiple field screening borings, temporary monitoring wells and permanent monitoring wells will be installed around the former UST 884 tank location (Figure 11). Field screening Geoprobe borings SCREEN1 through SCREEN6 (Figure 11) will be advanced at locations around the former UST 884 location to determine the local groundwater flow direction, which is assumed to be towards the northwest based on regional groundwater maps (Attachment A). These borings will be advanced past the water table, which is assumed to be at approximately 6 ft bgs based on previous drilling at ARE-800-TMW-05 (Reference 9). The field screening borings will be logged visually and with a PID which has proven useful for identifying fuel oil contamination at FTMM. The field results will be used to select the locations for temporary wells to assist with delineating the groundwater plume.

A total of four additional temporary monitor wells are proposed at UST 884. A line of three temporary monitor wells (TMW-01 through TMW-03) will be installed approximately 60 ft downgradient of the tank to verify the direction and lateral boundaries of the plume. A fourth temporary monitor well (TMW-04) will be installed approximately 60 ft farther downgradient to establish the downgradient extent of the plume, prior to installing a downgradient permanent sentry well. As with the field screening borings, the borings for temporary wells will be logged visually and with a PID to estimate the extent of the plume in the field. Additional field screening borings may be used to determine the downgradient extent of the plume. The temporary wells will be installed within Geoprobe borings and will typically be completed with a 5-foot well screen to approximately 4 ft below the water table (approximately 6 ft bgs). Samples will be collected from each temporary well and analyzed for VOCs and SVOCs in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Three new permanent monitoring wells will be installed to monitor groundwater at the source area (MW-01), within the plume (MW-02), and at a downgradient sentry location (MW-03). These wells will be installed after the analytical data for the temporary wells have been evaluated; based on these data, the actual locations may be adjusted from those shown on Figure 11. The new wells will be developed, and sampled using low-flow methods. The samples will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Water level measurements will be collected from the three new monitoring wells and from nearby existing wells 800MW01 and 800MW02 (located west and north of Building 800), to determine the

local groundwater flow direction. It is anticipated that a remedial investigation report will be prepared for UST 884.

12. UST 906A

UST 906A was a steel 1,000-gallon No. 2 fuel oil UST that was removed in June 1990 (Attachment D of Reference 1). NJDEP did not approve the Army's NFA request for UST 906A due to elevated TPH levels in soil and 2-methylnaphthalene in groundwater at a concentration greater than the GWQC (Reference 14). The Army subsequently prepared a Work Plan for the UST 906A area (Reference 4), which was approved by NJDEP (Reference 16).

Field work at the UST 906A site was performed in April, May, and August 2016 and consisted of Geoprobe soil sampling near the former tank area and temporary well sampling from within and downgradient of the former UST 906A tank area. Soil sample results are presented in Table 2 and Figure 12, and as indicated, Extractable Petroleum Hydrocarbons (EPH) concentrations were greater than the NJDEP cleanup criteria of 5,100 mg/kg are present near the former tank area. The soil EPH exceedance has not been delineated in the northwest direction from the former tank site. One soil sample from boring PAR-68-SB-04 (Figure 12) was also analyzed for SVOCs and 2-methylnaphthalene in this sample (35 mg/kg) exceeded the NJDEP IGW screening level.

Groundwater analyses are presented in Table 3 and Figure 13. The groundwater sample at PAR-68-TMW-01 from the former UST 906A source area exceeded the GWQC for 1,2,2-trichloroethane (present at 4.6 µg/L) and total SVOC TICs (present at 2,719 µg/L). The groundwater sample further downgradient at PAR-68-TMW-02 exceeded the GWQC for 1,2,4-trimethylbenzene (102 µg/L), 2-methylnaphthalene (386 µg/L) and total SVOC TICs (2,319 µg/L). Based on these groundwater results, it is apparent that a groundwater plume associated with UST 906A has migrated in the north-northwest direction below Building 906 and farther downgradient an unknown distance. Therefore, additional data, as described below, are needed to delineate groundwater contamination at former UST 906A.

Multiple soil borings, temporary monitoring wells and permanent monitoring wells will be installed around the former UST 906A tank location, as shown on Figures 12 and 13. Field screening Geoprobe borings (locations PAR-68-TMW-2-1 through TMW-2-4 shown on Figure 13) were previously used in April 2016 to verify the north-northwest direction of plume migration; therefore, additional field screening borings are not proposed for the future work.

One additional soil boring (SB-07 on Figure 12) will be advanced to the northwest of the former UST 906A excavation for collection of soil samples to delineate the EPH exceedances in this direction. Three soil samples will be collected from this boring to characterize the soil with depth: one from above, one from within, and one from below the most contaminated soil interval within the boring. The soil samples will be analyzed for EPH and the sample with the highest field indications of contamination will be analyzed for the SVOCs 2-methylnaphthalene and naphthalene, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

A total of three temporary monitoring wells will be installed. A line of two temporary monitoring wells (TMW-03 and TMW-04 on Figure 13) will be installed approximately 100 ft downgradient of the tank to verify the lateral boundaries of the plume. The previous temporary well PAR-68-TMW-02 established the plume migration direction. An additional temporary monitoring well (TMW-05)

will be installed approximately 70 ft further downgradient to verify the downgradient extent of the plume, prior to installing a permanent downgradient sentry well. The borings for temporary wells will be logged visually and with a PID to estimate the extent of the plume in the field. Additional field screening borings may be used to determine the downgradient extent of the plume. The temporary wells will be installed within Geoprobe borings and will typically be completed with a 5 foot well screen to approximately 4 ft below the water table (approximately 5 ft bgs). Groundwater samples will be collected from each temporary well and will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Three new permanent monitoring wells will be installed to monitor groundwater at: the source area (MW-01, same location as new soil boring SB-07); within the plume (MW-02, same location as previous temporary well PAR-68-TMW-02); and at a downgradient sentry location (MW-03). These wells will be installed after the analytical data from the new temporary wells have been evaluated; the actual locations may be adjusted from those shown on Figure 13 based on these data. The new wells will be developed and sampled using low-flow methods and the groundwater samples will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Water level measurements will be collected from the three new monitoring wells and from nearby existing well M12MW14 (Figure 13) to determine the local groundwater flow direction. It is anticipated that a remedial investigation report will be prepared for UST 906A.

13. UST 3035

UST 3035 was a steel 5,000-gallon No. 2 fuel oil UST that was removed in 1989. The location of former UST 3035 is not well documented and has been estimated based on the location of the former boiler room at Building 3035 (Figure 14).

As described in Reference 5, closure soil samples were not collected when former UST 3035 was removed. The SI Report Addendum was submitted to NJDEP along with a request for a NFA determination. NJDEP was unable to approve the NFA request without analytical data (Reference 17) and the Army proposed additional sampling (Reference 7) which was approved by NJDEP (Reference 18) and is the basis of the work described below.

Soil samples will be collected from three borings (SB-01, SB-02, and SB-03) (Figure 14) to support a future NFA request. Two soil samples will be collected from each boring. At each boring, a sample will be collected from approximately 8.0-8.5 ft bgs (or another interval representative of the soil below the removed tank) and from a 6-inch interval just above the water table (approximately 2 ft bgs). One of these two soil samples will be collected from the most contaminated interval encountered based on field evidence (visual, olfactory, or PID screening). If there is no field evidence of petroleum contamination, then the two soil samples will be collected from 8.0-8.5 ft bgs and from just above the water table (approximately 3 ft bgs). Each soil sample will be analyzed for total EPH with additional contingency SVOCs analyses (25 percent) for naphthalene and 2-methylnaphthalene if EPH concentrations exceed 1,000 mg/kg. These soil analyses are consistent with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E. A letter report will be prepared for UST 3035 that reports the results of this investigation.

14. SUMMARY

We look forward to your review of this Work Plan and approval or comments. The technical Point of Contact (POC) for this matter is Kent Friesen at (732) 383-7201 or by email at kent.friesen@parsons.com. Should you have any questions or require additional information, please contact me by phone at (732) 380-7064 or by email at william.r.colvin18.civ@mail.mil.

Sincerely,



William R. Colvin, PMP, PG, CHMM
BRAC Environmental Coordinator

cc: Ashish Joshi, NJDEP (e-mail and 2 hard copies)
William Colvin, BEC (e-mail and 1 hard copy)
Joseph Pearson, Calibre (e-mail)
James Moore, USACE (e-mail)
Jim Kelly, USACE (e-mail)
Cris Grill, Parsons (e-mail)

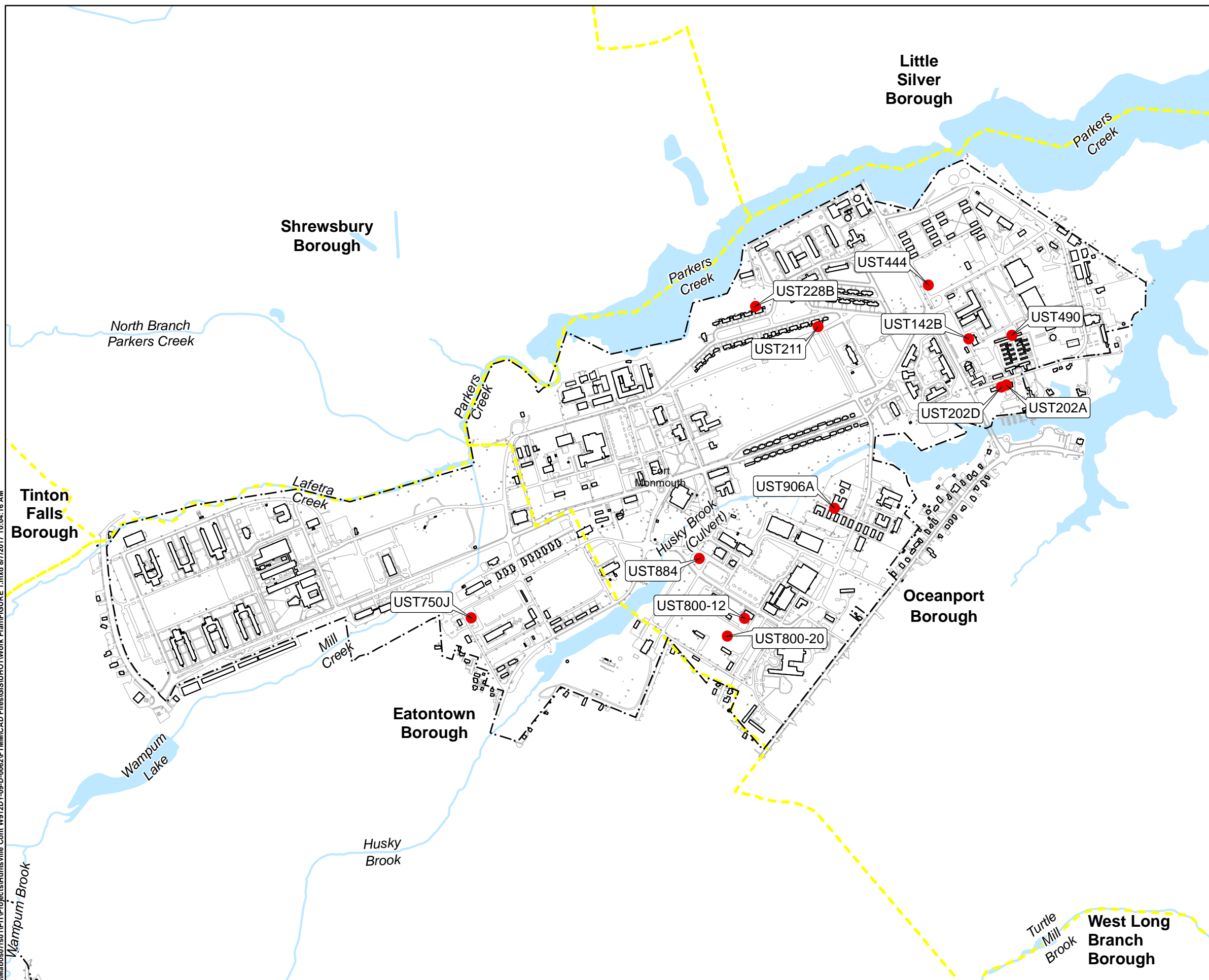
REFERENCES CITED:

1. Department of the Army. 2015. *Underground Storage Tanks Within Parcel 68, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. April 14.
2. Department of the Army. 2015. *Underground Storage Tanks Within ECP Parcel 79, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. April 22.
3. Department of the Army. 2015. *No Further Action Request, Site Investigation Report Addendum for the 800 Area Including, ECP Parcels 55 and 56, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. June 12.
4. Department of the Army. 2016. *Parcel 68 Work Plan Addendum for a Former UST Site, Fort Monmouth, Oceanport, Monmouth County, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. March 2.
5. Department of the Army. 2016. *No Further Action Request, Site Investigation Report Addendum for the Howard Commons Underground Storage Tanks, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. April 26.
6. Department of the Army. 2016. *No Further Action Request, Site Investigation Report Addendum for the Building 750 Motor Pool Area Including Underground Storage Tanks, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. October 28.
7. Department of the Army. 2016. *Clarification of Underground Storage Tanks at Howard Commons, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. December 6.
8. Department of the Army. 2016. *No Further Action Request, Site Investigation Report Addendum, ECP Parcel 72 Underground Storage Tanks, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. December 13.
9. Department of the Army. 2017. *Request for No Further Action at Multiple 800 Area Underground Storage Tanks, Site Investigation Report Addendum, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. January 23.
10. Department of the Army. 2017. *Request for No Further Action at Multiple Parcel 79 Storage Tank Site Investigation Report Addendum, Fort Monmouth, Oceanport, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. February 8.

11. New Jersey Department of Environmental Protection (NJDEP). 2007. Letter to the Army, RE: *Underground Storage Tank Closure & Remedial Investigation Reports, 800 Area UST No. 9, 800 Area UST No. 12, Fort Monmouth, NJ*. December 31.
12. New Jersey Department of Environmental Protection (NJDEP). 2010. *Protocol for Addressing Extractable Petroleum Hydrocarbons*. Site Remediation Program. Version 5.0. August 9.
13. New Jersey Department of Environmental Protection (NJDEP). 2015. Letter to the Army, RE: *Underground Storage Tanks Within ECP Parcel 79 dated April 2015, Fort Monmouth, Oceanport, Monmouth County*. August 25.
14. New Jersey Department of Environmental Protection (NJDEP). 2015. Letter to the Army, RE: *Underground Storage Tanks Within ECP Parcel 68, 74, and 77 dated April 2015, Fort Monmouth, Oceanport, Monmouth County*. September 24.
15. New Jersey Department of Environmental Protection (NJDEP). 2015. Letter to the Army, RE: *Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 & 56, Fort Monmouth, Oceanport, Monmouth County*. November 10.
16. New Jersey Department of Environmental Protection (NJDEP). 2016. Letter to the Army, RE: *Parcel 68 Work Plan Addendum and Response to NJDEP's September 24, 2015 Comments on the April 2015 Underground Storage Tanks Within ECP Parcels 68, 74 and 77, Fort Monmouth, New Jersey & Parcel 68 Work Plan Addendum for a Former UST Site (March 2016)*. March 29.
17. New Jersey Department of Environmental Protection (NJDEP). 2016. Letter to the Army, RE: *No Further Action Request Site Investigation Report Addendum for the Howard Commons Underground Storage Tanks dated April 2016, Fort Monmouth, Oceanport, Monmouth County*. November 28.
18. New Jersey Department of Environmental Protection (NJDEP). 2016. Letter to the Army, RE: *Clarification of Underground Storage Tanks at Howard Commons dated December 6, 2016, Fort Monmouth, Oceanport, Monmouth County*. December 20.
19. New Jersey Department of Environmental Protection (NJDEP). 2017. Letter to the Army, RE: *No Further Action Request Site Investigation Report Addendum ECP Parcel 72 Underground Storage Tanks dated December 13, 2016, Fort Monmouth, Oceanport, Monmouth County*. February 7.
20. New Jersey Department of Environmental Protection (NJDEP). 2017. Letter to the Army, RE: *Request for No Further Action at Multiple 800 Area Underground Storage Tanks, Site Investigation Report Addendum, Fort Monmouth, Oceanport, Monmouth County*. March 16.
21. New Jersey Department of Environmental Protection (NJDEP). 2017. Letter to the Army, RE: *No Further Action Request Site Investigation Report Addendum for the Building 750 Motor Pool Area Including Underground Storage Tanks, Fort Monmouth, Oceanport, Monmouth County*. April 4.

22. New Jersey Department of Environmental Protection (NJDEP). 2017. Letter to the Army, RE: *Request for No Further Action at Multiple Parcel 79 Storage Tanks Site Investigation Report Addendum, Fort Monmouth, Oceanport, Monmouth County*. May 8.
23. Parsons. 2013. *Final Sampling and Analysis Plan, Remedial Investigation/Feasibility Study/Decision Documents, Fort Monmouth, Oceanport, Monmouth County, New Jersey*. Prepared for the U.S. Army Engineering and Support Center, Huntsville, AL. Revision 0. March.
24. Parsons. 2015. *Final Environmental Condition of Property Supplemental Phase II Site Investigation Work Plan for Parcels 28, 38, 39, 49, 57, 61 and 69*. Prepared for the U.S. Army Engineering and Support Center, Huntsville, AL. Revision 1. August.
25. Parsons. 2016. *Final Accident Prevention Plan, Remedial Investigation/Feasibility Study/Decision Documents, Fort Monmouth, Oceanport, Monmouth County, New Jersey*. Prepared for the U.S. Army Engineering and Support Center, Huntsville, AL. Revision 1. November.

\\mabos071s01\PT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\UHOT\Work Plan\FIGURE 1.mxd 8/7/2017 10:04:16 AM

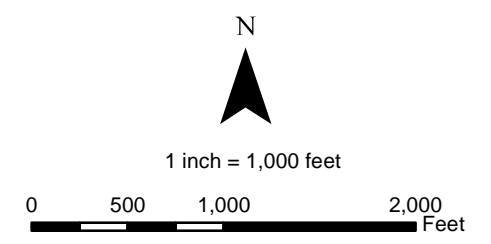


LEGEND:

- UHOT Location
- Installation Boundary
- Municipal Boundary
- Surface Water Feature

NOTE:

UST3035 is located within the Charles Woods area, see text.



Source: FTMM Supplied CAD, 2013; ESRI Data and Maps, 2011; USGS NHD, 2012.

PARSONS 401 Diamond Drive NW, Huntsville AL		Fort Monmouth New Jersey	
UHOT LOCATIONS			
CREATED BY: RR	REVIEWED BY: KF	DATE: AUG. 2017	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-06031	FILE: FIGURE 1.mxd		

**TABLE 1
SAMPLING SUMMARY FOR SUPPLEMENTAL UHOT WORK PLAN
FORT MONMOUTH, NEW JERSEY**

Parcel	Location and General Rationale (see text)	Field Installation				Field Meter Readings ^{a/}	VOCs + TICs by Method 8260C ^{b/}	SVOCs + TICs by Method 8270D ^{c/}	Non-Fractionated EPH ^{d/ e/}
		SCRN	TMW	MW	SB				
Groundwater									
79	UST 142B (Figure 2) - 1 permanent well for low turbidity groundwater sample for release detection	--	--	1	--	1	1	1	0
81	USTs 202A and 202D (Figure 3) - Multiple groundwater samples for release detection (UST 202A) and delineation (UST 202D)	1	3	1	--	5	5	5	0
72	UST 211 (Figure 4) - multiple field screening borings and groundwater samples for delineation	7	4	3	--	14	7	7	0
79	UST 444 (Figure 6) - multiple field screening borings and groundwater samples for delineation	6	3	3	--	12	6	6	0
79	UST 490 (Figure 7) - multiple field screening borings and groundwater samples for delineation	2	4	2	--	7	7	7	0
51	UST 750J (Figure 8) - One groundwater sample for release detection	--	1	--	--	1	1	1	0
55	UST 800-12 (Figure 9) - multiple field screening borings and groundwater samples for delineation	6	4	3	--	13	7	7	0
56	UST 800-20 (Figure 10) - multiple field screening borings and groundwater samples for delineation	6	4	3	--	13	7	7	0
54	UST 884 (Figure 11) - multiple field screening borings and groundwater samples for delineation	6	4	3	--	13	7	7	0
68	UST 906A (Figure 13) - multiple groundwater samples for delineation	0	3	3	--	6	6	6	0
Soil									
72	UST 228B (Figure 5) - 1 soil sample for 2-methylnaphthalene analysis by SPLP ^{f/}	--	--	--	1	1	0	1 (SPLP)	0
68	UST 906A (Figure 12) - 1 additional soil boring for delineation	--	--	--	1	1	0	1	3
1	UST 3035 (Figure 14) - 3 soil borings for release detection	--	--	--	3	3	0	2	6
QA/QC samples (see SAP for additional details) ^{g/}									
Field Duplicates (5% Sampling Frequency per media)		NA ^{h/}	NA	NA	NA	NA	3	4	1
Matrix Spike (5% Sampling Frequency per media)		NA	NA	NA	NA	NA	3	4	1
Matrix Spike Duplicate (5% Sampling Frequency per media)		NA	NA	NA	NA	NA	3	4	1
Trip Blank (1 per cooler of VOCs per media)		NA	NA	NA	NA	NA	3	0	0
QA Split (5% per media)		NA	NA	NA	NA	NA	3	4	1
Equipment Blank (5% Sampling Frequency per media)		NA	NA	NA	NA	NA	3	4	1
TOTAL		34	30	22	10	NA	72	77	14

Notes:

- ^{a/} SCRN = Geoprobe boring for field screening; TMW = temporary monitor well; MW = Permanent monitor well; SB = soil boring for soil analyses
- ^{a/} Field meter readings include, in soil samples: photoionization detector (PID) readings along entire soil column; and in groundwater: PID headspace pH, temperature, electrical conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity.
- ^{b/} VOCs = volatile organic compounds; TICs = tentatively identified compounds.
- ^{c/} SVOCs = semivolatile organic compounds; TICs = tentatively identified compounds.
- ^{d/} EPH = extractable petroleum hydrocarbons.
- ^{e/} If any EPH concentrations in soil exceed 1000 mg/kg in any of the site samples, then minimum 25% of the samples where EPH exceeds 1000 mg/kg.
- ^{f/} SPLP = Synthetic Precipitation Leachate Procedure method SW1312
- ^{g/} QA/QC = quality assurance/quality control; SAP = Sampling and Analysis Plan.
- ^{h/} NA = not applicable.



State of New Jersey

CHRIS CHRISTIE
Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Case Management
401 East State Street
P.O. Box 420/Mail Code 401-05F
Trenton, NJ 08625-0028
Phone #: 609-633-1455
Fax #: 609-292-2117

BOB MARTIN
Commissioner

KIM GUADAGNO
Lt. Governor

March 16, 2017

William Colvin
BRAC Environmental Coordinator
OACSIM – U.S. Army Fort Monmouth
PO Box 148
Oceanport, NJ 07757

Re: *Request for No Further Action at Multiple 800 Area Underground Storage Tanks, Site Investigation Report Addendum*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin,

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced report, received January 25, 2017, prepared by the Department of the Army's Office of Assistant Chief of Staff for Installation Management in response to the NJDEP letter correspondence of November 10, 2015 and to present the results of additional field sampling at nine former underground storage tanks (USTs). A ground water investigation was performed at each of the nine former UST locations, as required. The report is approved; comments are as follows:

USTs Requiring No Additional Action

Following review of the information provided in the referenced submittal, it is agreed no further action is necessary for the following #2 fuel USTs:

UST 800-1
UST 800-9
UST 800-21
UST 813
UST 814
UST 888

USTs Requiring Additional Remedial Efforts

The ground water analytical results from temporary well points at each of the following former UST locations exceed applicable Ground Water Quality Standards, N.J.A.C. 7:9-6. As indicated in the submittal, additional remediation is necessary at each of the following USTs:

UST 800-12

UST 800-20

UST 884

This office looks forward to receipt of your anticipated course of action to address the elevated levels of ground water.

Please contact this office if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads "Linda S. Range". The signature is fluid and cursive, with the first name being the most prominent.

Linda S. Range

C: James Moore, USACE
Joseph Pearson, Calibre
Joseph Fallon, FMERA
Rick Harrison, FMERA



DEPARTMENT OF THE ARMY

OFFICE OF ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
U.S. ARMY FORT MONMOUTH
P.O. 148
OCEANPORT, NEW JERSEY 07757

23 January 2017

Ms. Linda Range
New Jersey Department of Environmental Protection
Bureau of Case Management
401 East State Street
PO Box 420/Mail Code 401-05F
Trenton, NJ 08625-0028

**Re: Request for No Further Action at Multiple 800 Area Underground Storage Tanks
Site Investigation Report Addendum
Fort Monmouth, New Jersey**

Attachments:

- A. Figure 1 Study Area Location (800 Area) and Figure 2 – Study Area 800 Sample Locations (showing exceedances)
- B. Tables: Validated Laboratory Data Results for Groundwater, Area 800
- C. Field Notes
- D. Boring Logs
- E. Analytical Data

Previous Correspondence (not attached):

1. Army letter to NJDEP dated 12 June 2015, re: *No Further Action Request Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 and 56, Fort Monmouth, New Jersey.*
2. NJDEP letter to the Army dated 10 November 2015, re: *Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 & 56 Fort Monmouth, Oceanport, Monmouth County.*
3. Army letter to NJDEP dated 3 March 2016, Subject: *800 Area Work Plan Addendum and Response to NJDEP's November 10, 2015 Comments on the June 2015 No Further Action Request, Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 and 56, Fort Monmouth, New Jersey.*
4. NJDEP letter to Army dated 4 April 2016, re: *800 Area Work Plan Addendum and Response to NJDEP's November 10, 2015 Comments on the June 2015 No Further Action Request, Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 and 56, Fort Monmouth, New Jersey.*

Dear Ms. Range:

The U.S. Army Fort Monmouth (FTMM) Team has prepared this addendum to present the results of additional field sampling at nine former Underground Storage Tanks (USTs) 800-1, 800-9, 800-12, 800-20, 800-21, 813, 814, 884, and 888). These USTs were unregulated heating oil tanks (UHOTs) and were located within Environmental Condition of Property (ECP) Parcels 54, 55, 56 and 57 (designated as the 800 Area). In the previous 1993 through 2011 field investigations, soil contamination was found to extend within the proximity of the groundwater table. The Army's 03 March 2016 Work Plan (Correspondence 3) that described the groundwater investigation to be performed in April 2016 was determined to be acceptable by the NJDEP (Correspondence 4). The Work Plan did not include additional soil sampling at the nine UST locations.

One temporary groundwater monitoring well was installed with a Geoprobe[®] rig immediately downgradient of the limits of excavation at each of the nine UST locations. Temporary monitoring wells ARE-800-TMW05 and ARE-800-TMW06 were sampled on 18 and 19 April 2016. Temporary monitoring wells ARE-800-TMW01, ARE-800-TMW02, ARE-800-TMW03, ARE-800-TMW04, ARE-800-TMW07, ARE-800-TMW08, and ARE-800-TMW09 were sampled on 1, 2, and 4 August 2016. A groundwater sample was collected from each temporary well and analyzed for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) plus tentatively identified compounds (TICs), in accordance with the requirements for No. 2 fuel oil in Table 2-1 of the New Jersey Administrative Code (NJAC) 7:26E Technical Requirements for Site Remediation.

The locations of the field samples are presented in **Attachment A**. The analytical results and exceedances of applicable NJDEP criteria are provided in **Attachment B**. Field notes are provided in **Attachment C**, and boring logs are provided in **Attachment D**. The samples were analyzed by ALS Environmental; analytical data packages are provided in **Attachment E**.

The results of the groundwater sampling and analyses are provided below for each of the nine UST sites.

UST 800-1

UST 800-1 was a residential fuel oil tank that was removed in 2003 as described in Attachment F of Correspondence 1. Temporary well ARE-800-TMW-04 was installed, sampled, and subsequently abandoned (**Attachment A**). Groundwater was encountered at approximately 4 feet below ground surface (bgs); please see **Attachment D**. As shown on Table 2 of **Attachment B**, there were no exceedances of the NJDEP Ground Water Quality Criteria (GWQC).

UST 800-9

UST 800-9 was a residential fuel oil tank that was removed in 2004 as described in Attachment H of Correspondence 1. Temporary well ARE-800-TMW-06 was installed, sampled, and subsequently abandoned (**Attachment A**). As indicated in **Attachment D**, groundwater was

encountered at approximately 9 feet below ground surface (bgs). As shown on Table 2 of **Attachment B**, there were no exceedances of the GWQC.

UST 800-12

UST 800-12 was a residential fuel oil tank that was removed in 2004 as described in Attachment J of Correspondence 1. Temporary well ARE-800-TMW-07 was installed, sampled, and subsequently abandoned (**Attachment A**). As indicated in **Attachment D**, groundwater was encountered at approximately 8.5 feet bgs. As shown on Table 2 of **Attachment B**, two SVOCs (2-methylnaphthalene and benzo[a]anthracene) exceeded the GWQC. SVOC TICs also exceeded the GWQC.

UST 800-20

UST 800-20 was a residential fuel oil tank that was removed in 2003 as described in Attachment O of Correspondence 1. Temporary well ARE-800-TMW-08 was installed, sampled, and subsequently abandoned (**Attachment A**). As indicated in **Attachment D**, groundwater was encountered at approximately 7 feet bgs. As shown on Table 2 of Attachment B, one VOC (1,1,2-trichloroethane) and six SVOCs (2-methylnaphthalene, benzo[a]anthracene, benzo[a]pyrene, benzo[ghi]perylene, benzo[k]fluoranthene, and indeno[1,2,3-cd]pyrene) exceeded the GWQC. SVOC TICs also exceeded the GWQC.

UST 800-21

UST 800-21 was a residential fuel oil tank that was removed in 2003 as described in Attachment P of Correspondence 1. Temporary well ARE-800-TMW-09 was installed, sampled, and subsequently abandoned (**Attachment A**). As indicated in **Attachment D**, groundwater was encountered at approximately 8.5 feet bgs. As shown on Table 2 of **Attachment B**, there were no exceedances of the GWQC.

UST 813

UST 813 was a residential fuel oil tank that was removed in 2010 as described in Attachment R of Correspondence 1. Temporary well ARE-800-TMW-02 was installed, sampled, and subsequently abandoned (**Attachment A**). As indicated in **Attachment D**, groundwater was encountered at approximately 5.5 feet bgs. As shown on Table 2 of **Attachment B**, the SVOC benzo(a)anthracene (0.2 µg/l) and benzo(a)pyrene (0.11 µg/l) slightly exceeded the GWQC (0.1 µg/l). However, this detection was estimated ("J" flagged) due to the low concentrations encountered. These analytes are polycyclic aromatic hydrocarbons (PAHs) that have been encountered at other FTMM locations within surficial soils and fill. These low level groundwater exceedances are considered to have resulted from entrainment of soil from other anthropogenic, non-UST related sources (such as surficial soils or fill) resulting in sample turbidity which is common with temporary well groundwater samples. There were no exceedances of the GWQC indicative of fuel oil.

UST 814

UST 814 was a residential fuel oil tank that was removed in 1990 as described in Attachment S of Correspondence 1. Temporary well ARE-800-TMW-01 was installed, sampled, and subsequently abandoned (**Attachment A**). As indicated in **Attachment D**, groundwater was encountered at approximately 5 feet bgs. As shown on Table 2 of **Attachment B**, there were no exceedances of the GWQC.

UST 884

UST 884 was a residential fuel oil tank that was removed in 2003 as described in Attachment U of Correspondence 1. Temporary well ARE-800-TMW-05 was installed, sampled, and subsequently abandoned (**Attachment A**). As indicated in **Attachment D**, groundwater was encountered at approximately 6 feet bgs. As shown on Table 2 of **Attachment B**, the sum of VOC TICs concentrations (981 µg/l) and the SVOC 2-methynaphthalene (150 µg/l) exceeded the GWQC (500 and 30 µg/l, respectively). The SVOC naphthalene was also detected (86 µg/l), but it did not exceed the GWQC (300 µg/l).

UST 888

UST 888 was a residential fuel oil tank that was removed in 2011 as described in Attachment V of Correspondence 1. Temporary well ARE-800-TMW-03 was installed, sampled, and subsequently abandoned (**Attachment A**). As indicated in **Attachment D**, groundwater was encountered at approximately 5 feet bgs. As shown on Table 2 of **Attachment B**, there were no exceedances of the GWQC.

In summary, we request No Further Action determinations for USTs 800-1, 800-9, 800-21, 813, 814, and 888. Additional work would be needed for NFA determinations to be made for USTs 800-12, 800-20, and 884. Our technical Point of Contact (POC) is Kent Friesen; (732) 383-7201 or kent.friesen@parsons.com. Should you have any questions or require additional information, please contact me by phone at (732) 380-7064 or by email at william.r.colvin18.civ@mail.mil.

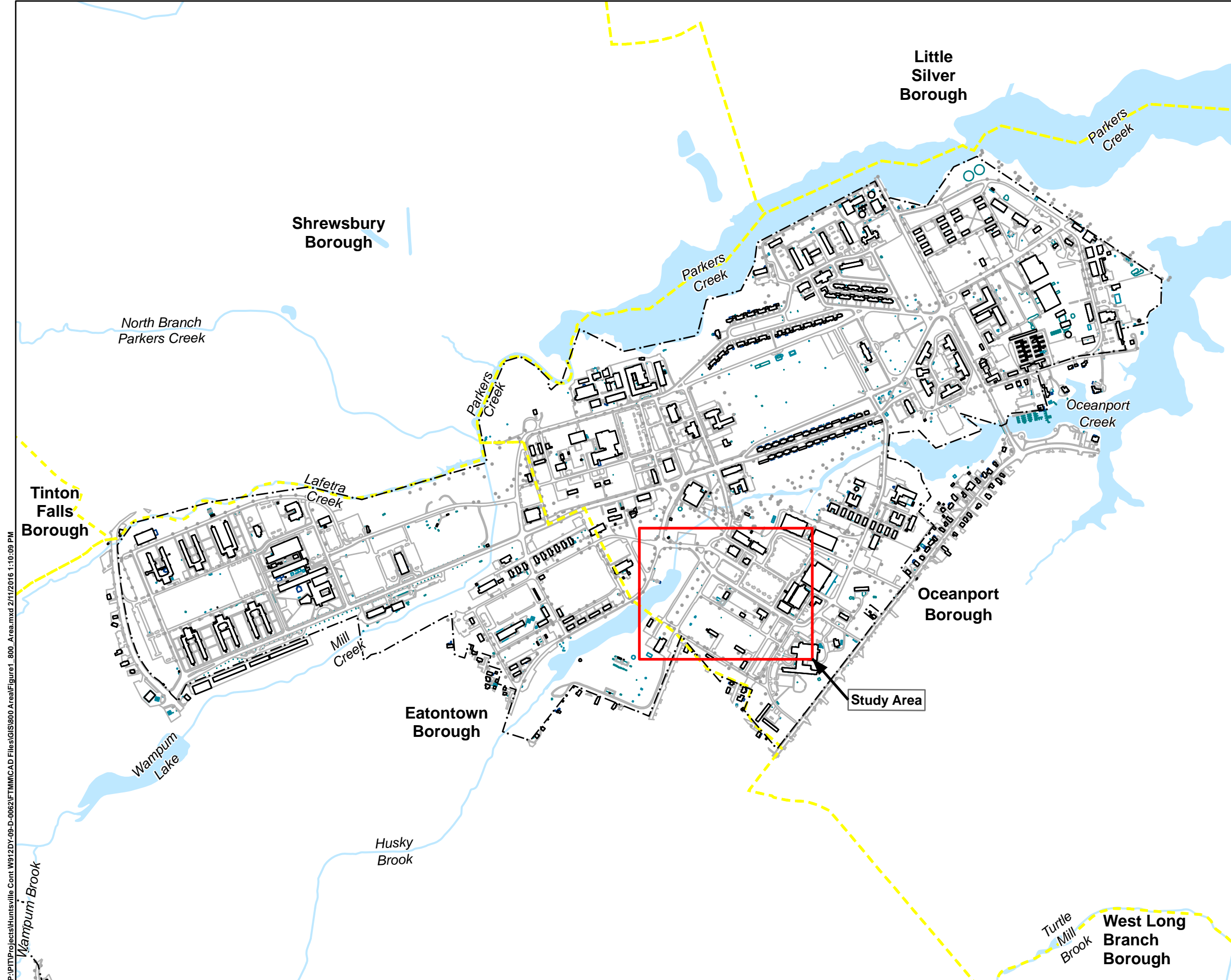
Sincerely,



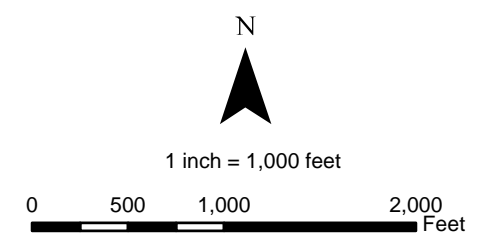
William R. Colvin, PMP, PG, CHMM
BRAC Environmental Coordinator

cc: Linda Range, NJDEP (e-mail and 3 hard copies)
Delight Balducci, HQDA ACSIM (e-mail)
Joseph Pearson, Calibre (e-mail)
James Moore, USACE (e-mail)
Jim Kelly, USACE (e-mail)
Cris Grill, Parsons (e-mail)

Attachment A
Figure 1 Study Area Location (800 Area) and Figure 2 Study Area 800
Sample Locations (showing exceedances)



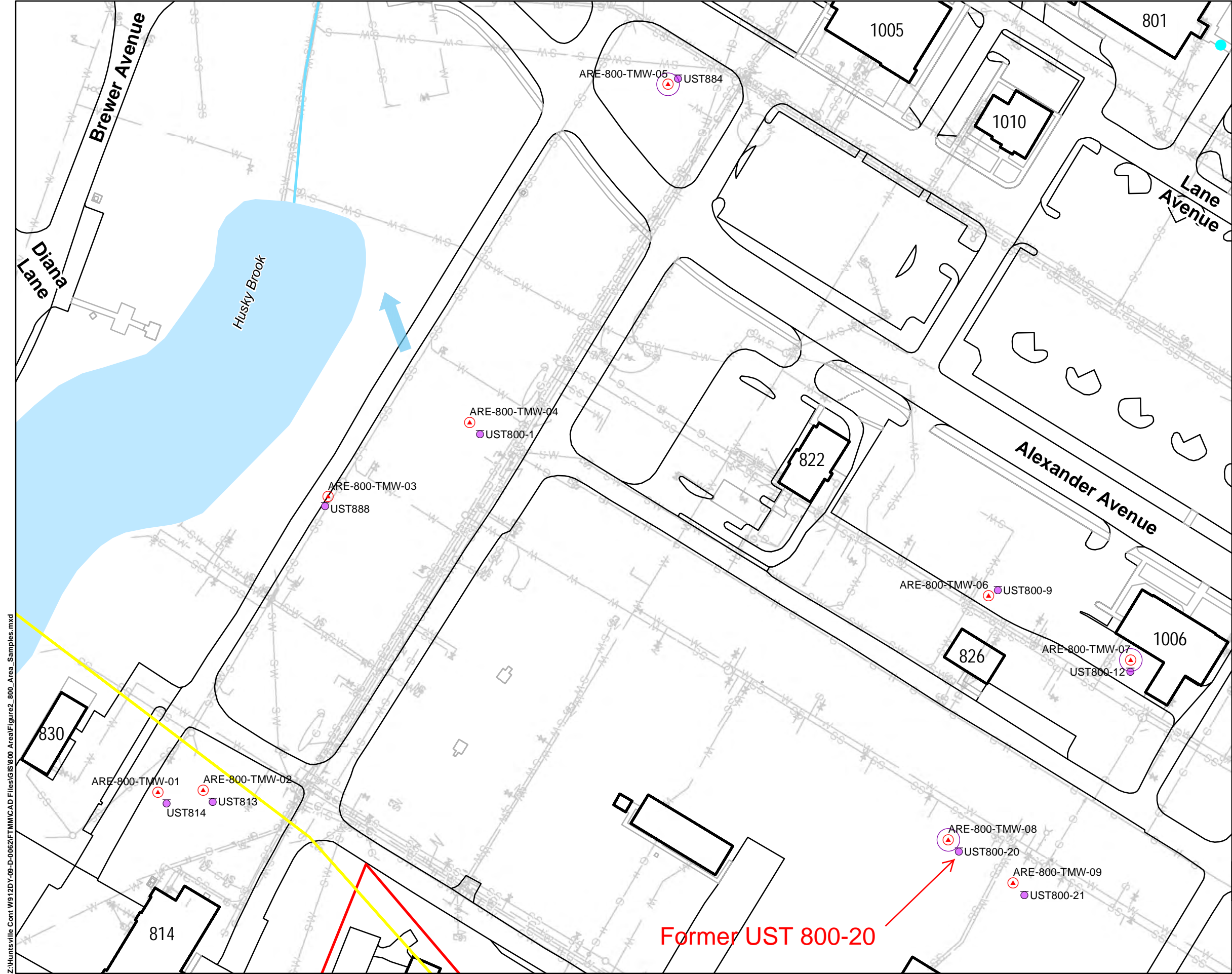
- LEGEND:**
- Parcel Boundary
 - Installation Boundary
 - Municipal Boundary
 - Surface Water Feature



Source: FTMM Supplied CAD, 2013; ESRI Data and Maps, 2011; USGS NHD, 2012.

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
STUDY AREA LOCATION (800 AREA)	
CREATED BY: RR	REVIEWED BY: KF
DATE: FEB. 2016	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-01000	FILE: Figure1_800_Area.mxd

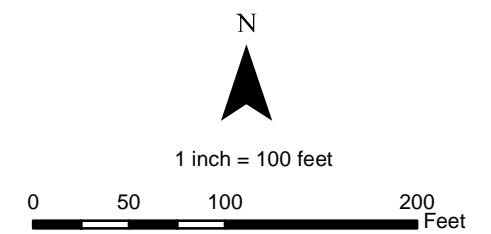
P:\PT\Projects\Huntsville.Cont.W912DY-09-D-0062\FTMMCAD Files\GIS\800 Area\Figure1_800_Area.mxd 2/11/2016 1:10:09 PM



- LEGEND:**
- Groundwater Sample
 - Exceedance of Groundwater Quality Criteria
 - Former UST Location
 - + Shallow Monitoring Well
 - Municipal Boundary
 - Installation Boundary
 - W Water Line
 - S Sanitary Sewer Line
 - SW Storm Sewer Line
 - G Gas Line
 - ➔ Estimated Groundwater Flow Direction

NOTE:

- Groundwater samples will be collected from temporary wells.



Source: FTMM Supplied CAD, 2013.

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
--	------------------------------------

**STUDY AREA 800
SAMPLE LOCATIONS**

CREATED BY: TS	REVIEWED BY: KF
DATE: JAN. 2017	FIGURE NUMBER: FIGURE 2
PROJECT NUMBER: 748810-02060	FILE: Figure2_800_Area_Samples.mxd

Z:\Huntsville Cont W912DY-08-D-0062\FTMMCAD Files\GIS\800 Area\Figure2_800_Area_Samples.mxd



State of New Jersey

CHRIS CHRISTIE
Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Case Management
401 East State Street
P.O. Box 420/Mail Code 401-05F
Trenton, NJ 08625-0028
Phone #: 609-633-1455
Fax #: 609-633-1439

BOB MARTIN
Commissioner

KIM GUADAGNO
Lt. Governor

April 4, 2016

William R. Colvin
BRAC Environmental Coordinator
OACSIM – U.S. Army Fort Monmouth
PO Box 148
Oceanport, NJ 07757

Re: *800 Area Work Plan Addendum and Response to NJDEP's November 10, 2015
Comments on the June 2015 No Further Action Request, Site Investigation Report
Addendum for the 800 Area Including ECP Parcel 55 and 56, Fort Monmouth &
800 Area Work Plan Addendum for Former UST Sites (March 2016)*

Dear Mr. Colvin,

The New Jersey Department of Environmental Protection (NJDEP) has completed review of the referenced submittals. The ground water investigation as proposed for the USTs referenced in Section 4.0 of the Work Plan is acceptable.

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

C: Joe Pearson, Calibre
Rick Harrison, FMERA
Joe Fallon, FMERA
James Moore, USACE
Cris Grill, Parsons,
Frank Barricelli, RAB



DEPARTMENT OF THE ARMY

OFFICE OF ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
U.S. ARMY FORT MONMOUTH
P.O. 148
OCEANPORT, NEW JERSEY 07757

March 3, 2016

Ms. Linda Range
New Jersey Department of Environmental Protection
Bureau of Case Management
401 East State Street
PO Box 420/Mail Code 401-05F
Trenton, NJ 08625-0028

SUBJECT: 800 Area Work Plan Addendum and Response to NJDEP's November 10, 2015 Comments on the June 2015 *No Further Action Request, Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 and 56, Fort Monmouth, New Jersey*
PI G000000032

Dear Ms. Range:

Fort Monmouth and Parsons have reviewed the New Jersey Department of Environmental Protection (NJDEP) comments on the subject submittal for the 800 Area including ECP Parcels 55 and 56, as documented in your letter dated November 10, 2015. We appreciate this opportunity to work with you on the 800 Area. Responses to your comments are provided below:

A. USTs Requiring No Additional Action

A1. COMMENT: *Underground storage tanks within these parcels previously granted a designation of no further action (NFA) include the following:*

Parcel 55

UST 1006-159

UST 826-134

UST 828-136

Parcel 56

UST 875-234

UST 876-139

UST 876-138

UST 864-136

UST 866-137

A1. RESPONSE: Agreed.

A2: COMMENT: *Following review of the referenced information, it is agreed no further action is necessary for the following #2 fuel USTs:*

UST 800-2 (Attachment G)

UST-800-10 (Attachment I)

UST-800-14 (Attachment K)

UST 800-15 (Attachment L)

UST-800-16 (Attachment M)

UST-800-19 (Attachment N)

UST 800-22 (Attachment Q)

UST 850 (Attachment T)

A2: RESPONSE: Agreed.

B. USTs Requiring Additional Remedial Efforts

B1. COMMENT: *Based upon soil contamination extending to within 2' of, and in some cases, into the ground water table (GWT), a ground water investigation in accordance with Technical Rules for Site Remediation is necessary at the following UST locations. Unless otherwise indicated, analytical parameters are to include VOs+TICs and SVOs+TICs (N.J.A.C. 7:26E-2.1, Table 2-1).*

UST 800-1 – Attachment F – Parcel 55 - #03-07-30-1431

UST 800-9 – Attachment H – Parcel 55 - #04-05-20-1615-42

UST 800-12 – Attachment J – Parcel 55 - #04-05-25-1623-31

UST-800-20 – Attachment O – Parcel 56 - #03-07-30-1431

UST 800-21 – Attachment P – Parcel 56 - #03-09-11-0906-50

UST 813 – Attachment R – Parcel 54 - #10-12-17-1533-15

UST 814 – Attachment S – Parcel 54 – It is agreed the submitted soil analytical results, which indicate no exceedences are present, were likely collected at Building 814. Although ground water analytical results indicate no exceedences of #2 fuel related constituents, the anomalous Oct '92 GW results cannot be dismissed. Therefore, collection of a ground water sample for VOs+TICs analyses is required.

UST 884 – Attachment U – Parcel 57 - #03-10-07-1347-49

UST 888 – Attachment V – Parcel 56 - #11-01-05-1416-41

B1. RESPONSE: Additional groundwater sampling is proposed to assess the potential for impacts to groundwater from each of the nine UST sites listed above, as described in the attached **800 Area Work Plan Addendum**. A total of nine groundwater samples will be collected from temporary well locations downgradient of these former USTs.

Linda S. Range, NJDEP
Response to Comments
SI Report Addendum for the 800 Area Including ECP Parcels 55 and 56
March 3, 2016
Page 3 of 3

We look forward to your review of these responses and approval or additional comments. The technical Point of Contact (POC) for this matter is Kent Friesen at (732) 383-7201 or by email at kent.friesen@parsons.com. Should you have any questions or require additional information, please contact me by phone at (732) 380-7064 or by e-mail at william.r.colvin18.civ@mail.mil.

Sincerely,



William R. Colvin, PMP, PG, CHMM
BRAC Environmental Coordinator

Attachment:

800 Area Work Plan Addendum for Former UST Sites

cc: Linda Range, NJDEP (e-mail and 3 hard copies)
Delight Balducci, HQDA ACSIM (e-mail)
Joseph Pearson, Calibre (e-mail)
James Moore, USACE (e-mail)
Jim Kelly, USACE (e-mail)
Cris Grill, Parsons (e-mail)

Fort Monmouth
Oceanport, Monmouth County, New Jersey
800 Area Work Plan Addendum for Former UST Sites
Date: March 2016

1.0 PURPOSE

The purpose of this 800 Area Work Plan Addendum is to outline the site-specific Scope of Work (SOW) for the environmental investigation of former No. 2 fuel oil underground storage tank (UST) sites within the 800 Area (which includes Parcels 55 and 56) at Fort Monmouth. In general, the scope consists of groundwater sampling at nine UST sites to assess the potential for impacts to groundwater. The field activities will involve installation of temporary monitor wells within Geoprobe borings at 9 former UST sites, and collection of “grab” groundwater samples for chemical analysis for petroleum constituents.

2.0 REFERENCE DOCUMENTS

HEALTH AND SAFETY - All Site personnel are required to read, understand, and comply with the safety guidelines in the Accident Prevention Plan (APP) including the Site Health and Safety Plan (SHASP), which is included as Appendix A of the APP.

FIELD PROCEDURES – The detailed field procedures to be used for the activities described in this sampling plan are described in the March 2013 Final Sampling and Analysis Plan (SAP).

3.0 SITE BACKGROUND

The 800 Area is located within the south-central portion of the Main Post at Fort Monmouth (**Figure 1**). Available information for multiple USTs at the 800 Area was previously provided to NJDEP in the Army’s submittal dated June 12, 2015 and entitled *No Further Action Request, Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 and 56, Fort Monmouth, New Jersey*. The NJDEP determined No Further Action (NFA) was required for 16 USTs in their letter dated November 10, 2015; however, they also required assessment of groundwater at an additional nine UST sites that are the subject of this work plan addendum. Groundwater flow directions are interpreted to be towards the north-northwest in this area (**Figure 2**).

4.0 SAMPLING LOCATIONS

Locations for sampling are shown on **Figure 2**. A summary of the field sampling and analytical activities is presented in **Table 1**. Sampling of groundwater is proposed from immediately downgradient of the limits of excavation at former tank locations UST 800-1, 800-9, 800-12, 800-20, 800-21, 813, 814, 884, and 888. A Geoprobe® boring will be completed to approximately 4 feet below the water table at each location shown on **Figure 2**. Groundwater from these locations will be sampled using temporary wells

Fort Monmouth
800 Area Work Plan Addendum

within the Geoprobe borings, and then the borings will be abandoned. Eight groundwater samples will be analyzed for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) plus tentatively identified compounds (TICs), as specified in Table 2-1 of the NJAC 7:26E Technical Requirements for Site Remediation. The groundwater sample from UST 814 will only be analyzed for VOCs plus TICs.

TABLE 1
SAMPLING SUMMARY FOR 800 AREA WORK PLAN ADDENDUM
FORT MONMOUTH, NEW JERSEY

Parcel	Location	Field Meter Readings ^{a/}	VOCs + TICs by Method 8260C ^{b/}	SVOCs + TICs by Method 8270D ^{c/}	Non-Fractionated EPH ^{d/}
Groundwater					
54, 55, 56, 57	USTs 800-1, 800-9, 800-12, 800-20, 800-21, 813, 814, 884, and 888 (Figure 2) - 1 groundwater sample each; VOCs only for UST 814	9	9	8	0
QA/QC samples (see SAP for additional details) ^{e/}					
Field Duplicates (5% Sampling Frequency per media)		NA	1	1	0
Matrix Spike (5% Sampling Frequency per media)		NA	1	1	0
Matrix Spike Duplicate (5% Sampling Frequency per media)		NA	1	1	0
Trip Blank (1 per cooler of VOCs per media)		NA	1	0	0
QA Split (5% per media)		NA	1	1	0
Equipment Blank (5% Sampling Frequency per media)		NA	1	1	0
TOTAL		NA	15	13	0

Notes:

NA = not applicable.

TBD = to be determined.

^{a/} Field meter readings include, in soil samples: photoionization detector (PID) readings along entire soil column; and in groundwater: PID headspace, pH, temperature, electrical conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity.

^{b/} VOCs = volatile organic compounds; TICs = tentatively identified compounds.

^{c/} SVOCs = semivolatile organic compounds; TICs = tentatively identified compounds.

^{d/} EPH = extractable petroleum hydrocarbons.

^{e/} QA/QC = quality assurance/quality control; SAP = Sampling and Analysis Plan. The requirement for QA/QC samples may be fulfilled with samples from other parcels.



State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Case Management
401 East State Street
P.O. Box 420/Mail Code 401-05F
Trenton, NJ 08625-0028
Phone #: 609-633-1455
Fax #: 609-633-1439

BOB MARTIN
Commissioner

November 10, 2015

John Occhipinti
BRAC Environmental Coordinator
OACSIM – U.S. Army Fort Monmouth
PO Box 148
Oceanport, NJ 07757

Re: *Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 & 56*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Occhipinti:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced report, received June 22, 2015, prepared by the Department of the Army's Office of Assistant Chief of Staff for Installation Management to provide responses to NJDEP letters of September 5, 2007 and December 31, 2007.

USTs Requiring No Additional Action

Underground storage tanks within these parcels previously granted a designation of no further action (NFA) include the following:

Parcel 55

UST 1006-159
UST 826-134
UST 828-136

Parcel 56

UST 875-234
UST 876-139
UST 876-138
UST 864-136
UST 866-137

Following review of the referenced information, it is agreed no further action is necessary for the following #2 fuel USTs:

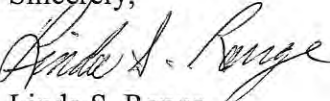
UST 800-2 (Attachment G)
UST-800-10 (Attachment I)
UST-800-14 (Attachment K)
UST 800-15 (Attachment L)
UST-800-16 (Attachment M)
UST-800-19 (Attachment N)
UST 800-22 (Attachment Q)
UST 850 (Attachment T)

USTs Requiring Additional Remedial Efforts

Based upon soil contamination extending to within 2' of, and in some cases, into the ground water table (GWT), a ground water investigation in accordance with the Technical Rules for Site Remediation is necessary at the following UST locations. Unless otherwise indicated, analytical parameters are to include VOs+TICs and SVOs+TICs (N.J.A.C. 7:26E-2.1, Table 2-1).

UST 800-1 – Attachment F – Parcel 55 - #03-07-30-1431
UST 800-9 – Attachment H – Parcel 55 – #04-05-20-1615-42
UST 800-12 – Attachment J – Parcel 55 - #04-05-25-1623-31
UST-800-20 – Attachment O – Parcel 56 - #03-07-30-1431
UST 800-21 – Attachment P – Parcel 56 - #03-09-11-0906-50
UST 813 – Attachment R – Parcel 54 - #10-12-17-1533-15
UST 814 – Attachment S – Parcel 54 – It is agreed the submitted soil analytical results, which indicate no exceedences are present, were likely collected at Building 814. Although ground water analytical results indicate no exceedences of #2 fuel related constituents, the anomalous Oct '92 GW results cannot be dismissed. Therefore, collection of a ground water sample for VOs+TICs analyses is required.
UST 884 – Attachment U – Parcel 57 - #03-10-07-1347-49
UST 888 – Attachment V – Parcel 56 - #11-01-05-1416-41

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

C: Joe Pearson, Calibre
Rich Harrison, FMERA
Joe Fallon, FMERA
James Moore, USACE
Frank Barricelli, RAB



DEPARTMENT OF THE ARMY

OFFICE OF ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
U.S. ARMY FORT MONMOUTH
P.O. 148
OCEANPORT, NEW JERSEY 07757

June 12, 2015

Ms. Linda Range
New Jersey Department of Environmental Protection
Case Manager
Bureau of Southern Field Operations
401 East State Street, 5th Floor
PO Box 407
Trenton, NJ 08625

**Re: No Further Action Request
Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55
and 56, Fort Monmouth, New Jersey**

Attachments:

- A. Correspondence
- B. Site Layout Drawings of 800 Area (Recent and Historical)
- C. Summary Table of 800 Area Underground Storage Tanks
- D. No Further Action Letters from NJDEP
- E. Geophysical Survey Reports
- F. UST 800-1 Report
- G. UST 800-2 File Review and Analyses
- H. UST 800-9 Report
- I. UST 800-10 File Review and Analyses
- J. UST 800-12 Report
- K. UST 800-14 File Review and Analyses
- L. UST 800-15 File Review and Analyses
- M. UST 800-16 File Review and Analyses
- N. UST 800-19 File Review and Analyses
- O. UST 800-20 File Review and Analyses
- P. UST 800-21 Report
- Q. UST 800-22 File Review and Analyses
- R. UST 813 File Review and Analyses
- S. UST 814 File Review and Analyses
- T. UST 850 File Review and Analyses
- U. UST 884 File Review and Analyses
- V. UST 888 File Review and Analyses
- W. 800 Area Excerpts from the 2005 Residential Communities Initiative (RCI) Remedial Action Report
- X. 800 Area Groundwater Monitoring Results

Previous Correspondence:

1. NJDEP letter to the Army dated September 5, 2007, re: *Remedial Action Report for the 800, 700, and 400 Areas, Ft Monmouth, NJ.*
2. NJDEP letter to the Army dated December 31, 2007, re: *Underground Storage Tank Closure & Remedial Investigation Reports, 800 Area UST No. 9, 800 Area UST No. 12, Ft Monmouth, NJ.*

References Cited:

1. Tetra Tech EM Inc. 2005. *Final Remedial Action Report for the 800, 700, and 400 Areas, U.S. Army Installation Fort Monmouth, Fort Monmouth, New Jersey.* October.

Dear Ms. Range:

The U.S. Army Fort Monmouth (FTMM) has reviewed existing file information for underground storage tank (UST) sites at Fort Monmouth within Environmental Condition of Property (ECP) Parcels 55, 56, and the surrounding 800 Area (which also includes portions of Parcels 54, 57, 58, 59, 63, 64, and 65). The purpose of this submittal is to provide comprehensive documentation of the location and updated closure status of all USTs identified within this parcel. Previous investigation results associated with the Residential Communities Initiative (RCI) activities within Parcel 56 (also referred to as the RCI 800 Area) have been reviewed, as well as the 2007 New Jersey Department of Environmental Protection (NJDEP) comments on the RCI Report (Correspondence 1; provided in Attachment A). This submittal provides a comprehensive response to NJDEP's previous comments on the RCI 800 Area (Correspondence 1). This information may be useful for the future Phase II property transfer.

The 800 Area includes that portion of the Main Post generally bounded by Razor Avenue to the north, Todd Avenue to the west, Cockayne Avenue and the Base boundary to the south, and Stephenson Avenue to the east (see recent and historical layout drawings presented in Attachment B). There are three designated Installation Restoration Program (IRP) sites located within the 800 Area, including the following:

- FTMM-47 Building 1002 Former PCB Transformer Site (located within Parcel 55),
- FTMM-64 Site 812 Former Leaking UST Site (also designated as Parcel 64), and
- FTMM-66 Site 886 Former Aboveground Storage Tank (also designated as Parcel 65).

These IRP sites are not specifically addressed within this submittal, although reference has been made to the sites as appropriate within the context of the 800 Area USTs.

Extensive soil sampling and numerous UST removals were conducted as part of the Army's RCI and Enhanced Use Leasing (EUL) programs within Parcel 56. Currently there are no buildings within Parcel 56; however, historically there were up to 28 barracks and other buildings within this area (see the historical layout map in Attachment B). The purpose of the RCI and EUL programs was to assess specific Fort Monmouth site areas for privatized housing and associated support buildings; subsequently the program was discontinued after closure of Fort Monmouth was announced in 2005.

A final report was prepared in 2005 under the RCI program that summarized the results of soils investigation and remediation activities within the 400, 700, and 800 Areas of Fort Monmouth, and requested No Further Action (NFA) for all three areas. In 2007, NJDEP commented

(Attachment A) that NFA could not be approved for the following reasons (*current Army responses concerning the 800 Area are provided in bold italics*):

- There was no documentation provided concerning the remediation and closure of USTs removed from the site (*documentation of UST closure activities for the entire 800 Area is presented in Section 1.0 below*); and
- A site investigation for groundwater was required (*a description of the 800 Area groundwater investigations is presented in Section 4.0 below*).

1.0 UNDERGROUND STORAGE TANKS

The locations of the USTs within the 800 Area are presented in Attachment B, and a summary table of these USTs is provided in Attachment C. All of the USTs identified within the 800 Area have been removed. Most of these USTs were either used for residential heating oil, or were less than 2000 gallons in size and used to store heating oil for nonresidential buildings, and are therefore considered unregulated heating oil tanks (UHOTs).

Multiple UHOTs within the 800 Area were previously approved for No Further Action (NFA) by NJDEP; documentation of this approval is provided in Attachment D, and referenced below. In these cases, there is generally a supporting investigation report that was previously submitted to NJDEP and that describes the basis for closure. For the sake of brevity, we have not included these reports for UHOTs where NFA has already been approved. However, these reports are available within the FTMM environmental records.

In the Attachment C table, the term "Case Closed" has been used (consistent with previous FTMM procedures) to indicate the Army determined that no further sampling or remedial actions were warranted for a specific UST site. "Case Open" indicates the Army previously determined that ongoing monitoring, reporting or possibly even remedial action was warranted. In contrast, "No Further Action" has been reserved for NJDEP approval that no further sampling or remedial actions are warranted. "Case Open" sites previously identified within the 800 Area in Attachment C can now be considered as "Closed" by this submittal.

Most of the 800 Area UHOTs were steel fuel oil tanks associated with previously demolished former barracks. Geophysical surveys were performed to locate potential UHOTs that may have remained after the buildings were removed, as described in Attachment E. A combination of geophysical surveys as well as historical maps and field use of metal detectors were used to locate multiple UHOTs within the 800 Area, which were subsequently removed.

We are submitting the following documentation for the multiple UHOTs that were previously removed from the 800 Area, and we request a No Further Action determination for each site (sites that have been previously approved for NFA by NJDEP are **highlighted in green**):

- **UST 800A NFA was approved by NJDEP on 1/10/2003 (Attachment D).**
- UST 800-1 investigation report is presented in Attachment F.
- UST 800-2 File Review summary and analyses is presented in Attachment G.
- UST 800-9 investigation report is presented in Attachment H. NJDEP's comment letter of 12/31/2007 (provided in Attachment A) indicated that additional groundwater analysis was required; see Section 4.0 below.
- UST 800-10 File Review summary and analyses is presented in Attachment I.

- UST 800-12 investigation report is presented in Attachment J. NJDEP's comment letter of 12/31/2007 (provided in Attachment A) indicated that additional groundwater analysis was required; see Section 4.0 below.
- UST 800-14 File Review summary and analyses is presented in Attachment K.
- UST 800-15 File Review summary and analyses is presented in Attachment L.
- UST 800-16 File Review summary and analyses is presented in Attachment M.
- UST 800-19 File Review summary and analyses is presented in Attachment N.
- UST 800-20 File Review summary and analyses is presented in Attachment O.
- UST 800-21 investigation report is presented in Attachment P.
- UST 800-22 File Review summary and analyses is presented in Attachment Q.
- UST 801A NFA was approved by NJDEP on 2/24/2000 (Attachment D).
- UST 801B NFA was approved by NJDEP on 1/10/2003 (Attachment D).
- UST 804A NFA was approved by NJDEP on 1/10/2003 (Attachment D).
- UST 804B NFA was approved by NJDEP on 7/10/1998 (Attachment D).
- UST 810 NFA was approved by NJDEP on 8/29/2000 (Attachment D).
- UST 811 NFA was approved by NJDEP on 8/29/2000 (Attachment D).
- UST 812 NFA was approved by NJDEP on 2/24/2000 (Attachment D).
- UST 813 File Review summary and analyses is presented in Attachment R.
- UST 814 investigation report is presented in Attachment S.
- UST 826 NFA was approved by NJDEP on 7/10/1998 (Attachment D).
- UST 828 NFA was approved by NJDEP on 2/24/2000 (Attachment D).
- UST 850 File Review summary and analyses is presented in Attachment T.
- UST 864 NFA was approved by NJDEP on 2/24/2000 (Attachment D).
- UST 866 NFA was approved by NJDEP on 2/24/2000 (Attachment D).
- UST 875 NFA was approved by NJDEP on 1/10/2003 (Attachment D).
- UST 876A NFA was approved by NJDEP on 2/24/2000 (Attachment D).
- UST 876B NFA was approved by NJDEP on 1/10/2003 (Attachment D).
- UST 884 File Review summary and analyses is presented in Attachment U.
- UST 886 NFA was approved by NJDEP on 1/10/2003 (Attachment D).
- UST 888 File Review summary and analyses is presented in Attachment V.
- UST 1006 NFA was approved by NJDEP on 8/29/2000 (Attachment D).

2.0 RESIDENTIAL COMMUNITIES INITIATIVE ACTIVITIES AT THE 700 AREA

Extensive soil sampling was performed in 2003 under the RCI to support an evaluation of privatized housing (Reference 1; see excerpts of this report pertaining to the 800 Area in Attachment W). Three areas of the Main Post were evaluated: the 400 Area, the 700 Area, and the 800 Area (see Figure 2 of Attachment W). The 800 Area as designated by the RCI program consisted of a 33 acre area that generally corresponds to ECP Parcel 56. The RCI studies included environmental assessment of soil using Geoprobe borings (at 100 ft centers; see Figure 3 of Attachment M), and full-suite analysis of soil samples for VOCs, SVOCs, pesticides, PCBs, and metals (provided in Appendix C of Reference 1). In addition, geophysical investigations were performed to delineate UHOTs historically used for fuel oil from former barracks that had been previously demolished, as discussed in Section 1.0 above (see also Attachment E). As a

result, multiple UHOTs were removed from the 800 Area from 2004 to 2011 with associated site assessment sampling, as discussed in Section 1.0 above.

Under the RCI program, the analytical results from the 75 initial 800 Area Geoprobe soil sampling locations were compared to then-current (2003) NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC), as reported in Attachment W. The rationale for residential criteria was based on the planned future use of the 800 Area for residential housing under the RCI/EUL. SVOCs, pesticides, and PCBs were found to exceed the RDCSCCs in certain discrete areas within the 800 Area (see Figures 4a and 4b in Attachment W), and therefore the impacted soils were excavated and removed for offsite disposal. Multiple rounds of additional step-out characterization sampling, soil excavation, and post-excavation sampling were performed to ensure that adequate soil was removed to meet the RDCSCCs. Final post-excavation soil sample results confirm that soils with SVOCs, pesticides, and PCBs concentrations in excess of the 2003 RDCSCCs were removed for offsite disposal (see Figures 5a and 5b in Attachment W).

The RCI/EUL results confirm that NFA is appropriate for the Parcel 56 soils.

3.0 GROUNDWATER INVESTIGATION AT 800 AREA

As previously described above, a report (Reference 1; see Attachment W) was submitted to NJDEP in 2005 that requested No Further Action for the RCI sites, including Parcel 56 which was designated as the 800 Area under the RCI. In 2007, NJDEP commented (Attachment A) that NFA could not be granted for the 800 Area because the USTs were not adequately addressed (this requirement has been met in Section 1.0), and because additional groundwater monitoring was required for the 800 Area (discussed in this Section). Attachment X includes documentation of previous groundwater monitoring activities for the 800 Area.

Well construction information for two groundwater monitoring wells (800MW01 and 800MW02) located downgradient of the 800 Area is presented in Enclosure 1 of Attachment X. Enclosure 2 of Attachment X presents the result of 2010 groundwater modeling and water elevation measurements for the area of Ft. Monmouth encompassing the 800 Area, which demonstrate that these two wells are located downgradient of the 800 Area. Shallow groundwater flow direction was primarily towards the north-northwest from the 800 Area towards these wells. Monitor well records and boring logs are provided in Enclosure 3 of Attachment X; shallow groundwater was typically encountered at approximately 6 to 9 ft bgs.

Monitoring well 800MW01 was installed in 2000 to evaluate the adequacy of closure of UST 800A. This well was monitored quarterly for VOCs and SVOCs from 2000 to 2001, and UST 800A was subsequently approved for NFA by NJDEP on 1/10/2003 (Attachment D). Well 800MW01 was more recently sampled in May 2010, and analytical results were non-detected for all VOC and SVOC analytes (Enclosure 4 of Attachment X).

Monitoring well 800MW02 was installed in 2010 and was sampled in February 2011. Analytical results were non-detected for all VOCs and for most SVOC analytes. Select Ion Monitoring (SIM) analysis of polynuclear aromatic hydrocarbons (PAHs) was performed for more sensitive detection of PAHs. The only analytes detected by SVOC-SIM were naphthalene (0.150 µg/L) and phenanthrene (0.136 µg/L), which were well below the applicable NJDEP groundwater quality criteria of 300 and 100 µg/L, respectively.


In summary, there were no indications of a contaminant release to groundwater from the 800 area. This conclusion is based on two shallow monitoring wells completed within a UST source area and in a downgradient portion of the parcels. Groundwater contamination associated with USTs 812 (FTMM-64) and 886 (FTMM-66) will be addressed under separate cover.

4.0 SUMMARY

This information supports the conclusion that UHOTs and RCI program issues identified within the 800 Area have been adequately addressed by previous environmental activities. Multiple UHOT sites were identified within Parcels 55 and 56, as well as adjoining areas of Parcels 54, 57, 58, and 59 that comprise the 800 Area, that were addressed under the FTMM tank removal and assessment program. The RCI program identified several areas where individual sample results for PCBs and SVOCs exceeded the residential cleanup criteria in soils; however, the affected soils were subsequently excavated and removed from the site for offsite disposal.

In summary, we submit that the Army has provided adequate due diligence with regards to the environmental condition of the Parcels represented within the 800 Area, and we request that NJDEP approve No Further Action. The technical Point of Contact (POC) for this matter is Kent Friesen at (732) 383-7201 or by email at kent.friesen@parsons.com. Should you have any questions or require additional information, please contact me by phone at (732) 383-5104 or by email at john.e.occhipinti.civ@mail.mil.

Sincerely,



John E. Occhipinti
Fort Monmouth Site Manager

cc: Delight Balducci, HQDA ACSIM
Joseph Pearson, Calibre
James Moore, USACE
Cris Grill, Parsons

Summary Table of 800 Area USTs

Site Name	RESIDE NTIAL	Registration/ D	DICAR	Tank Size and Type	Product	Army Case Status	Parcel	Comments on Current or Requested NJDEP Status
800 A	NO	81533-127		2000 gallon fiberglass	#2 FUEL OIL	Case Closed	58	NFA approved per 1/10/2003 NJDEP letter
800 1	YES	-	03-07-30-1431	1000 gallon steel	#2 FUEL OIL	Case Open	56	Submit TVS report and request NFA
800 2	YES	-		500 gallon steel	#2 FUEL OIL	Case Closed	56	Submit review summary and data; request NFA
800 9	YES	-	04-05-20-1615-42	1000 gallon steel	#2 FUEL OIL	Case Open	55	Submit TVS report and request NFA; see also NJDEP's 12/31/07 comment letter (Attachment A)
800 10	YES	-		1000 gallon steel	#2 FUEL OIL	Case Closed	55	Submit review summary and data; request NFA
800 12	YES	-	04-05-25-1623-31	1000 gallon steel	#2 FUEL OIL	Case Open	55	Submit TVS report and request NFA; see also NJDEP's 12/31/07 comment letter (Attachment A)
800 14	YES	-		1000 gallon steel	#2 FUEL OIL	Case Closed	55	Submit review summary and data; request NFA
800 15	YES	-		1000 gallon steel	#2 FUEL OIL	Case Closed	55	Submit review summary and data; request NFA
800 16	YES	-		1000 gallon steel	#2 FUEL OIL	Case Closed	56	Submit review summary and data; request NFA
800 19	YES	-		1000 gallon steel	#2 FUEL OIL	Case Closed	56	Submit review summary and data; request NFA
800 20	YES	-	03-07-30-1431	1000 gallon steel	#2 FUEL OIL	Case Open	56	Submit review summary and data; request NFA. There are two (redundant) 800-20 entries in the FTMM UST database.
800 21	YES	-	03-09-11-0906-50	1000 gallon steel	#2 FUEL OIL	Case Open	56	Submit TVS report and request NFA
800 22	YES	-		1000 gallon steel	#2 FUEL OIL	Case Closed	56	Submit review summary and data; request NFA
801A	NO	81533-128		2000 gallon fiberglass	#2 FUEL OIL	Case Closed	58	NFA approved per 2/24/2000 NJDEP letter
801B	NO	81533-129	95-11-13-1007-23	1000 gallon fiberglass	#2 FUEL OIL	Case Closed	58	NFA approved per 1/10/2003 NJDEP letter
804A	NO	81533-130	95-11-09-1328-28	1000 gallon fiberglass	#2 FUEL OIL	Case Closed	59	NFA approved per 1/10/2003 NJDEP letter
804B	NO	81533-228		1000 gallon fiberglass	#2 FUEL OIL	Case Closed	59	NFA approved per 7/10/1998 NJDEP letter
810	NO	81533-131		1000 gallon steel	#2 FUEL OIL	Case Closed	63	NFA approved per 8/29/2000 NJDEP letter

ATTACHMENT O

UST 800-20 File Review and Analyses

UNDERGROUND STORAGE TANK FILE REVIEW
 FORT MONMOUTH BRAC 05 FACILITY
 OCEANPORT, NEW JERSEY

Date: June 2, 2015 Review Performed By: Kent Friesen, Parsons

Site ID: **Bldg. 800-20** Registration ID: *None*

Recommended Status of Site: **Case Closed (change from "Case Open")**

UST Probability (from May 2014 "Addendum 1 ECP UHOT Report"): **High**

Based on the file review, were there indications of a contaminant release? Yes No

NJDEP Release No. or DICAR (If applicable): 03-07-30-1431

Did NJDEP approve No Further Action (NFA) for this site? Yes No Not Applicable

Tank Description: Steel Fiberglass Size: 1000 gals. Contents: No. 2 Fuel Oil

Residential Commercial/Industrial

Tank Removed? Yes No If "yes," removal date: 7/28/2003

Were closure soil samples taken? Yes No Analyses: TPH

Comparison criteria: 5,100 mg/kg TPH

Were closure soil sample results less than comparison criteria? Yes No

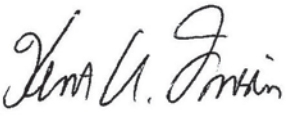
Brief Narrative

This tank was removed after it was identified by a geophysical survey as part of the Residential Communities Initiative (RCI) project within the 800 Area. It was named after the geophysical anomaly target number that led to the discovery of the tank.

Following tank removal in 2003, soil samples were collected from the tank excavation and analyzed by the Fort Monmouth Environmental Laboratory for total petroleum hydrocarbons (TPH). Three initial soil samples were collected from the excavation on August 1, 2003. TPH results ranged from non-detected to 10,076 mg/kg along the south sidewall. Additional contaminated soil was excavated, and the excavation was re-sampled on August 4 and 5, 2003. Final sample results ranged from non-detected to 181 mg/kg. The final results were less than 5,100 mg/kg for TPH, which is the current remediation criterion. Therefore, no additional sampling or remedial action was warranted. Approximately 80 cubic yards of petroleum contaminated soil was removed from the excavation.

In conclusion, the analytical results support the UST Case Status of "Case Closed." Since a steel tank was removed from this location, the UHOT Addendum probability of "High" for an additional tank appears overrated.

Recommendations (if any): Request NFA from NJDEP

Signed: 
 Kent A. Friesen, Parsons

Fort Monmouth UST Status Summary Report

UST REGISTRATION INFORMATION SUMMARY

LOCATION: 800 20 **NJDEP REG ID:**
RESIDENTIAL? YES

UST CONSTRUCTION INFORMATION SUMMARY

SIZE (GALLONS): 1000 **CONSTRUCTION:** STEEL
PRODUCT: #2 FUEL OIL **YEAR INSTALLED:**

UST REMOVAL/INVESTIGATION SUMMARY

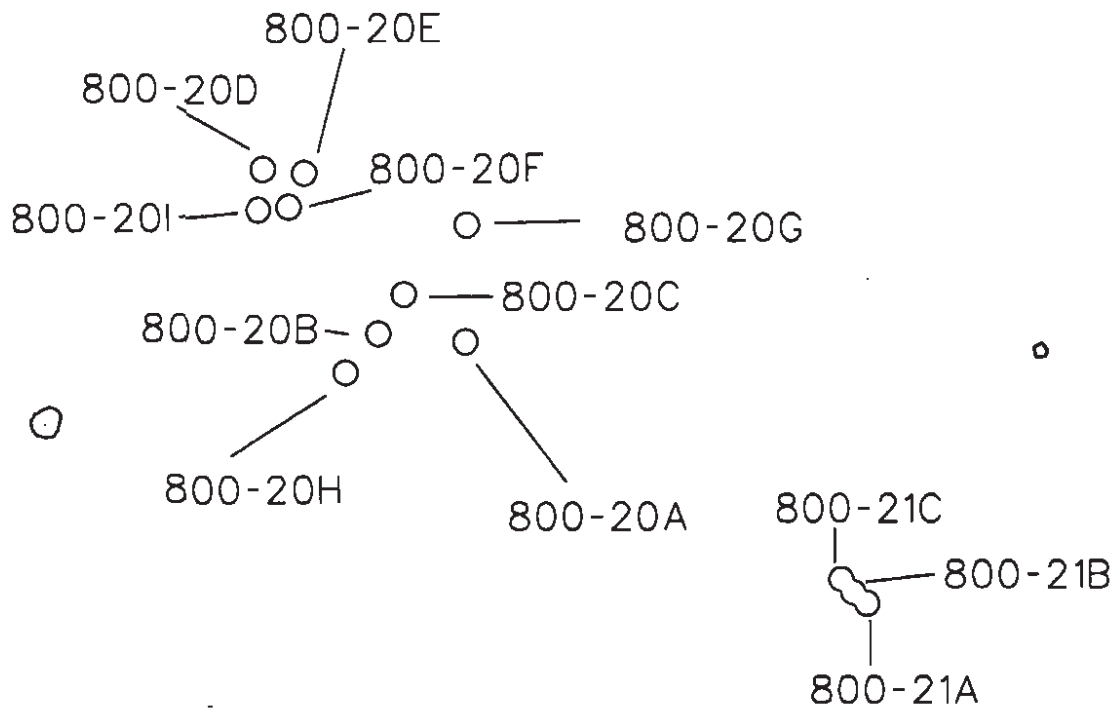
REMOVAL DATE: 10/10/2003 **REMOVAL CONTRACTOR:** TVS
SRF SEND DATE: **TMS:**
DICAR NO. 03-07-30-1431 **LEAK DETECT:**
REMEDICATION COMMENTS: 800 Area RCI project. UST removed. Overexcavation completed. Soil samples below criteria. Report pending.

REGISTRATION COMMENTS:

SAS DONE: **CONSULTANT:** TVS
MW's NEEDED: 0 **MONITORING WELLS:** 0
SUB-SURFACE EVALUATOR: Frank Accorsi

CURRENT UST STATUS

UST STATUS: Removed; Report Submitted/Not Nec. **CASE STATUS:** Case Open
SUBMITTAL DATE: **APPROVAL DATE:**



**FIGURE 2 - Site Map
800-20 AND 800-21 AREA**

**U.S. Army Garrison
Fort Monmouth, New Jersey**

SCALE:
1" = 28' Approx.

DATE:
January 03, 2006

ARMY, FORT MONMOUTH

DAILY UST CLOSURE LOG

BLDG.#: 800-20 REG.#: _____
 DATE: 7-31-03 TOA: 14:20 TOD: _____
 CLOSURE TECH: Harold Hornung NJDEP CERT.#: 0011047
 PERSONNEL: Marc Taylor, Anthony Fargione, Harold Hornung

ACTIVITY	YES NO
THE TECHNICIAN (CLOSURE CERT.) WAS ON-SITE DURING ALL CLOSURE RELATED ACTIVITIES	Y
THE SSE WAS ON-SITE DURING UST REMOVAL AND SITE SCREENING AND SAMPLING ACTIVITIES	Y
ALL ON-SITE PERSONNEL HAVE CURRENT TRAINING IAW ALL SAFETY REQ. (E.G. 29CFR)	Y
ALL UTILITIES WERE MARKED OUT PRIOR TO ANY EXCAVATION (VISUAL CONFIRM. YES/NO)	Y
HAND EXCAVATION WAS DONE WHEN EXCAVATING WITHIN 4 FT OF ANY UTILITIES	NA
ALL UST PIPING WAS BLOWN BACK AND DRAINED PRIOR TO ANY EXCAVATION WITH BACKHOE	NA
ALL UST PIPING WAS REMOVED PRIOR TO UST EXCAVATION	NA
A CONFINED ENTRY PERMIT WAS COMPLETED AND POSTED ON-SITE BY THE CONTRACTOR	NA
THE UST WAS CLEANED ^{Pumped out} AND NO RESIDUAL LIQUIDS WERE LEFT IN THE TANK	Y
THE UST WAS PLACED ONTO PLASTIC, SCRAPED OFF, INSPECTED FOR HOLES AND PHOTOGRAPHED	Y
_____ DRUMS OF WASTE WERE GENERATED AT THIS SITE TODAY (ID CARDS COMPLETED)	NA
_____ DRUMS OF WASTE WERE TRANSPORTED TO THE (MP, CW, EV) HWSA	NA
<u>990</u> GALLONS OF ^{water} oil WASTE WERE REMOVED (MANIFEST#: <u>NH2 4960</u>)	Y
_____ CUBIC YARDS OF PETROL. CONT. SOIL WERE EXCAVATED+TRANS TO (T-80, 2624)	
THE DPW WAS NOTIFIED OF ANY DISCHARGE TO THE ENVIRONMENT. (WHO) <u>Doug Gwinthe</u>	Y
ALL PETROL. CONT. SOILS WERE SECURED FROM THE WEATHER BY CLOSE OF BUSINESS TODAY	Y
THE DPW AUTHORIZED BACKFILLING THE EXCAVATION. SSE INITIAL REQUIRED: _____	
THE UST WAS TRANSPORTED TO <u>Bldg 166 Concrete pad</u> FOR DISPOSAL (ATTACH SCRAP TICKET)	
ADDITIONAL NOTES WERE TAKEN AND RECORDED ON THE BACK OF THIS FORM	
THE FOLLOWING DOCUMENTS WERE GIVEN TO THE SSE TODAY: (CIRCLE EACH OR ADD ITEMS)	
SCRAP TICKET, CSE PERMIT, ACCIDENT REPORT, _____	

CHECK ALL BOXES. LEAVE NO BLANKS

I certify under penalty of law that tank decommissioning activities were performed in compliance with N.J.A.C. 7:14B-9.2(b)3: I am aware that there are significant penalties for submitting false, inaccurate, or incomplete information, including fines and/or imprisonment.

CLOSURE TECH (PRINT NAME): _____

SIGNATURE: _____ DATE: _____

US ARMY, SELFM-PW-EV
DAILY UST SUBSURFACE REMOVAL LOG

BLDG.#: 800-20 REG.#: _____
 DATE: 7-31-03 TOA: 14:20 TOD: _____
 SSE: Harold Hornung NJDEP CERT.#: 0011047
 REMOVAL CONTRACTOR: TVS Inc. PWS-007
 CLOSURE SUPERVISOR: Harold Hornung NJDEP CERT.#: 0011047
 WEATHER: overcast 5-10 mph. east wind low 80's

ACTIVITY	YES / NO
THE TECHNICIAN (CLOSURE CERT.) WAS ON-SITE DURING ALL CLOSURE RELATED ACTIVITIES	Y
THE SSE WAS ON-SITE DURING UST REMOVAL AND SITE SCREENING AND SAMPLING ACTIVITIES	Y
ALL ON-SITE PERSONNEL HAD TRAINING IAW ALL SAFETY REQUIREMENTS (E.G. 29CFR)	Y
A CONFINED ENTRY PERMIT WAS COMPLETED AND POSTED ON-SITE BY THE CONTRACTOR	NA
THE UST WAS PLACED ONTO PLASTIC, SCRAPED OFF, INSPECTED FOR HOLES AND PHOTOGRAPHED	Y
A DISCHARGE WAS REPORTED BY THE DPW TO THE NJDEP (609-292-7172), CASE# _____ <u>Day Gwether</u>	Y
PHOTOS HAVE UST#, BLDG. #, DATE, TIME, NAME OF SSE AND DESCR. WRITTEN ON BACK	Y
GROUNDWATER WAS ENCOUNTERED AT _____ FEET BG, A SHEEN (WAS/WAS NOT) OBSERVED ON GW	
IF OVA WAS USED: WAS IT CAL. AND FOUND TO BE OPERATIONAL (cal. data on COC)	Y
IF SAMPLES WERE TAKEN: COC, SCALED SITE MAP (VERT. SOIL HORIZONS AND PLOT PLAN)	
ALL SAMPLE COLLECTION ACTIVITIES WERE AS DESCRIBED IN THE NJDEP FSPM, 1992	
ALL SAMPLING WAS BIASED TOWARD HIGHEST OVA/FID. RECORDED SITES IAW 7:26E-3.6 et seq.	
ALL PETROL. CONT. SOILS WERE SECURED FROM THE WEATHER BY CLOSE OF BUSINESS TODAY	
THE DPW SSE AUTHORIZED BACKFILLING THE EXCAVATION (STONE TO 1" ABOVE GROUNDWATER) AND A BACKFILL AUTH. LTR. IS ATTACHED	
ALL ENVIRONMENTAL SAMPLE POINTS WERE GPS AND LOGGED	
ADDITIONAL NOTES WERE TAKEN AND ARE RECORDED ON THE BACK OF THIS FORM	Y
THE FOLLOWING DOCUMENTS WERE ADDED TO THE PROJECT FOLDER TODAY: (CIRCLE EACH) SCRAP TICKET, CSE PERMIT, ACCIDENT REPORT, HAZ. WASTE MANIFEST, DAILY UST CLOSURE LOG, SCALED SITE MAP (SAMPLING), SRF-CLOSURE, CHAIN OF CUSTODY, SOIL ANALYTICAL RESULTS, CLEAN FILL TICKETS (IN YDS ³), PHOTOGRAPHS (UST, EXCAVATION, SAMPLING POINTS)	

CHECK ALL BOXES, LEAVE NO BLANKS

I certify under penalty of law that tank decommissioning activities were performed in compliance with N.J.A.C. 7:14B-9.2(b)3 and 7:26 et seq.. I am aware that there are significant penalties for submitting false, inaccurate, or incomplete information, including fines and/or imprisonment.

Closure Tech (print Name): _____ Date: _____

SIGNATURE: _____

The Tank was initially excavated on 7-28-03 contaminated soil was encountered and the team ran out of time so the area was fenced off and the Tank was cleaned, labeled, photographed and taken back to the Bldg 166 Concrete pad. 5 yds of petro-contam soil were transported to the Bldg 166 pad also.

On 7-31-03 the UST Team returned to continue the remediation of the 800-20 excavation.

1430 Excavate 2nd 5 yds of petro-cont. soil & transport to Bldg 166 Concrete pad.

15:00 Begins to rain

1530 load out 10 yds of petro soil into tandem truck

1600 will resume remediation on 8-1-03

8-1-03

800 Continue remediating excavation

10:00 Excavated & Transported 2/10 yd dump trucks of petro-cont. soil to Bldg 166 Concrete pad

10:30 Dump 1 10 yd dump truck of petro-cont. "

11:10 Dump 1 5 yd dump truck of petro-cont. "

11:40 Dump 1 10 yd " "

13:20 Dump 1 5 yd "

14:00 Dump 1 5 yd "

14:35 Dump 7 yds

14:50 Dump 1 5 yds " " south end

1500 Sample East wall and south wall + bottom. Will need to continue excavating N & W walls on 8-4-03.

800 AREA,

ENVIROSCAN, INC.

C. Appleby

DPW

10-22-08



USTs Known as

800-1

800-2

etc....

Appendix B

Compare Survey to Actual
USTs Removed

GPR Survey Results

Project No. 030301, Fort Monmouth, NJ

TARGET NUMBER	EASTING	NORTHING	DESCRIPTION	METHOD
1	2173762.327	538474.106	7' x 14' High amplitude parabolic reflector	TW-6/GPR
2	2173489.047	538275.903	6' x 10' High amplitude parabolic reflector	TW-6/GPR
3	2173474.031	538098.7216	Multiple utility lines, poor signal penetration using GPR	TW-6/GPR
4	2173338.893	538014.6354	Linear anomaly from storm sewer line towards Building 814	TW-6
5	2173350.905	537492.1004	3' x 4' High amplitude parabolic reflector	TW-6/GPR
6	2174185.76	538504.1366	Reinforced concrete sidewalk, Poor signal penetration using GPR	TW-6/GPR
7	2174218.794	538480.112	Reinforced concrete sidewalk, Poor signal penetration using GPR	TW-6/GPR
8	2174161.736	538486.1182	Reinforced concrete sidewalk, Poor signal penetration using GPR	TW-6/GPR
9	2174290.868	538314.943	8' x 13' EM anomaly	TW-6
10	2174356.935	538275.903	8' x 12' EM anomaly	TW-6
11	2174386.966	538296.9244	Reinforced Concrete Sidewalk	TW-6/GPR

Confirmed
UST

1-K
Removed

500 gal
Removed

1-K
Removed

1-K
Removed

ENVIROSCAN, INC.

TARGET NUMBER	EASTING	NORTHING	DESCRIPTION	METHOD	
12	2174419.548	538221.331	Multiple point target EM anomalies	TW-6	1-K Removed
13	2174486.068	538176.8014	5' x 5' EM anomaly	TW-6	
14	2174444.025	538107.7308	8' x 14' High amplitude parabolic reflector	TW-6/GPR	1-K Removed
15	2174227.803	538176.8014	8' x 14' High amplitude parabolic reflector	TW-6/GPR	1-K Removed
16	2174152.726	538230.8568	7' x 14' High amplitude parabolic reflector	TW-6/GPR	1-K Removed
17	2174128.702	538215.8414	4' x 5' High amplitude parabolic reflector, near surface	TW-6/GPR	
18	2174113.686	538131.7554	5' x 6' High amplitude parabolic reflector	TW-6/GPR	
19	2174185.76	538089.7124	7' x 13' High amplitude parabolic reflector	TW-6/GPR	1-K Removed
20	2174254.831	538047.6692	6' x 12' High amplitude parabolic reflector	TW-6/GPR	1-K Removed
21	2174320.899	538002.6232	8' x 13' High amplitude parabolic reflector	TW-6/GPR	1-K Removed
22	2174386.966	537963.5832	6' x 14' High amplitude parabolic reflector	TW-6/GPR	1-K Removed
23	2174510.092	537756.371	Small metal tube at surface, no Subsurface target detected	TW-6/GPR	
24	2174509.92368	537754.6006	Reinforced Concrete Sidewalk	TW-6/GPR	

FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

DIRECTORATE OF PUBLIC WORKS

PHONE: (732) 532-4359 FAX: (732) 532-6263

WET-CHEM - METALS - ORGANICS - FIELD SAMPLING

CERTIFICATIONS: NJDEP #13461, NYSDOH #11699



ANALYTICAL DATA REPORT Fort Monmouth Environmental Laboratory ENVIRONMENTAL DIVISION Fort Monmouth, New Jersey PROJECT: 03-38200

Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time of Collection	Date Received
800-20A, East Wall	3046401	Soil	01-Aug-03 15:20	08/01/03
800-20B, South Wall	3046402	Soil	01-Aug-03 15:25	08/01/03
800-20C, Bottom	3046403	Soil	01-Aug-03 15:30	08/01/03
800-20, Duplicate	3046404	Soil	01-Aug-03 15:30	08/01/03
800-20D, West Wall	3047301	Soil	04-Aug-03 15:15	08/04/03
800-20E, North West Wall	3047302	Soil	04-Aug-03 15:20	08/04/03
800-20, Duplicate	3047303	Soil	04-Aug-03 15:20	08/04/03
800-20F, Bottom North End	3047305	Soil	04-Aug-03 15:40	08/04/03
800-20G, North Wall East End	3047601	Soil	05-Aug-03 11:15	08/05/03
800-20H, South Wall East End	3047602	Soil	05-Aug-03 11:20	08/05/03
800-20, Duplicate	3047603	Soil	05-Aug-03 11:20	08/05/03
800-20I South Wall West End	3047605	Soil	05-Aug-03 11:50	08/05/03

FORT MONMOUTH ENVIRONMENTAL LAB TPHC, % SOLIDS

ENCLOSURE:
CHAIN OF CUSTODY
RESULTS


11-28-05
Daniel Wright
Laboratory Director

The enclosed report relates only to the items tested. The report may not be reproduced, except in full, without written approval of the U.S. Army Fort Monmouth Directorate of Public Works.



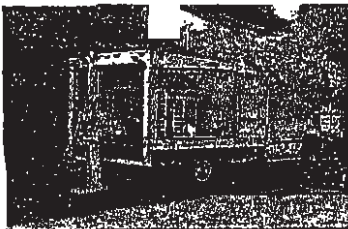
Table of Contents

Section	Pages
Chain of Custody	1-7
Method Summary	8-9
Laboratory Chronicle	10-11
Conformance/Non-Conformance	12-13
TPHC	14
Results Summary	15-17
Calibration Summary	18-49
Surrogate Results Summary	50-52
MS/MSD Results Summary	53-54
Raw Sample Data	55-82
Laboratory Deliverables Checklist	83
Laboratory Authentication Statement	84



**CHAIN
OF
CUSTODY**

000001



Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703

Tel (732)532-4359 Fax (732)532-3484 EMail:appleby@mail1.monmouth.army.mil

NJDEP Certification #13461

Chain of Custody Record



Customer: Joseph Fallon				Project No: 03-38200			Analysis Parameters					Comments: Methanol/ 4C	
Phone #: (732) 532-6223				Location: 800 Area			TPHC	VOA+15	%SOLIDS	VOA ID NUMBER	PID Reading		Remarks / Preservation Method
(X)DERA ()OMA ()Other: <u>UST Assessment</u>				Tank 20									
Samplers Name/Company :				Sample	#								
Lims I. D. #	Sample Location	Date	Time	Type	bottles								
30-104 01	800-20A East wall	8-1-03	15:20	Soil	2	X	X	X	3501	13	Depth 6 G.S		
02	800-20B South wall		15:25		1	X	X	X	3502	10.0	10		
03	800-20 C Bottom		15:30		2	X	X	X	3503	0	10		
04	800-20 Duplicate		15:30		2	X	X	X	3504	-	10		
05	800-20 Trip Blank		15:35	liquid	1		X		3505	-			
Relinquished by (signature): <i>[Signature]</i>				Date/Time: 8-1-03 15:45		Received by (signature): <i>[Signature]</i>			Relinquished by (signature):		Date/Time: Received by (signature):		
Relinquished by (signature):				Date/Time:		Received by (signature):			Relinquished by (signature):		Date/Time: Received by (signature):		
Report Type: () Full, (X) Reduced, () Standard, () Screen / non-certified						Remarks:							
Turnaround time: () Standard 4 wks, (X) Rush 2 Days, () ASAP Verbal _____ Hrs.													

000002



US ARMY - FT. MONMOUTH, NJ

800 AREA - UST #800-20

SOIL SAMPLE GPS POSITIONS & COORDINATES

US STATE PLANE 1983, NJ (NY EAST) 2900, NAD 1983 (CONUS)

(IN US SURVEY FEET)

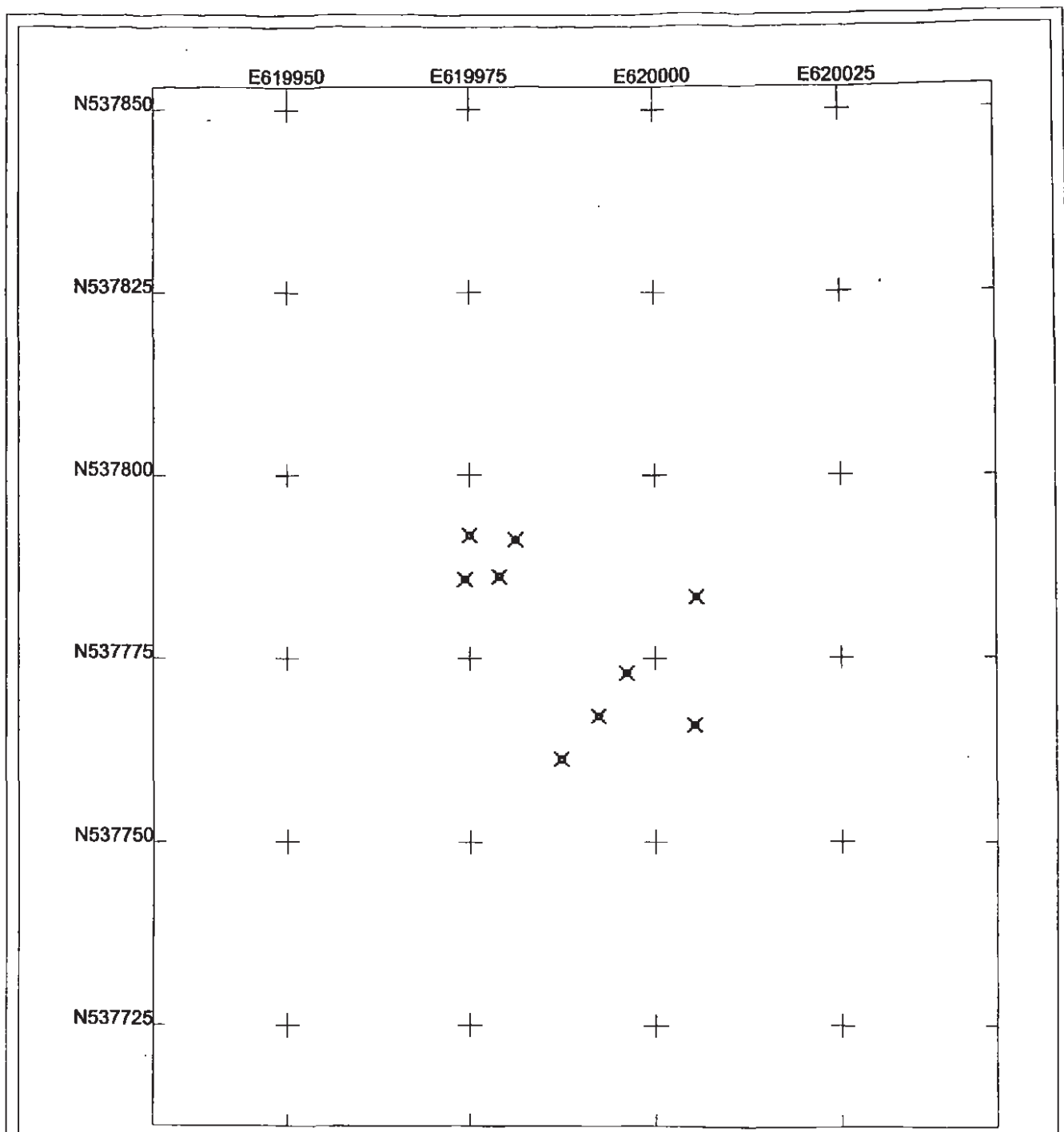
SAMPLE POINTS

<u>POSITION/DESCRIPTION</u>	<u>Y COORDINATE (NORTHING)</u>	<u>X COORDINATE (EASTING)</u>
800-20A east wall	537766.046	620005.32
800-20B south wall	537767.248	619992.307
800-20C bottom	537773.108	619996.118
800-20D west wall	537791.872	619974.89
800-20E northwest wall	537791.272	619981.096
800-20F bottom, north end	537786.267	619978.894
800-20G north wall east end	537783.464	620005.521
800-20H south wall east end	537761.442	619987.302
800-20I south wall west end	537785.866	619974.289

REFERENCE POINTS

<u>POSITION/DESCRIPTION</u>	<u>Y COORDINATE (NORTHING)</u>	<u>X COORDINATE (EASTING)</u>
B1006 CREDIT UNION WEST CORNER	537998.865	620157.192
B1006 CREDIT UNION NORTH CORNER	538043.64	620183.645
B1006 CREDIT UNION EAST CORNER	537988.336	620271.865
B1006 CREDIT UNION SOUTH CORNER	537943.187	620244.315

000006



U.S. Army - Ft. Monmouth 800 Area UST #800-20 Soil Sample GPS Map

US State Plane 1983
New Jersey 2900
NAD 1983 (Conus)



800usts.cor
11/28/2005
GPS Pathfinder
 **Trimble**



METHOD SUMMARY



Method Summary

NJDEP Method OQA-QAM-025 10/97 Gas Chromatographic Determination of Total Petroleum Hydrocarbons in Soil

Fifteen grams (15g) of soil is added to a 125-ml acid cleaned and solvent rinsed capped Erlenmeyer flask. 15g anhydrous Sodium Sulfate is added to dry the sample. Surrogate standard spiking solution is then added to the flask.

Twenty-five ml of Methylene Chloride is added to the flask and it is secured on an orbital shaker table. The agitation rate is set to 400 rpm and the sample is shaken for 30 minutes. The flask is removed from the table and the particulate matter is allowed to settle. The extract is transferred to a Teflon capped vial. A second 25-ml of Methylene Chloride is added to the flask and shaken for an additional 30 minutes. The flask is again removed and allowed to settle. The extracts are combined in the vial then transferred to a 1-ml autosampler vial.

The extract is then injected directly into a GC-FID for analysis. The sample is analyzed for Petroleum Hydrocarbons covering a range of C8-C42, including Pristane and Phytane. Total Petroleum Hydrocarbon concentration is determined by integrating between 5 minutes and 22 minutes. The baseline is established by starting the integration after the end of the solvent peak and stopping after the last peak. The final concentration of Total Petroleum Hydrocarbons is calculated using percent moisture, sample weight and concentration.



LABORATORY CHRONICLE

000010

Laboratory Chronicle

Lab ID: 30464, 30473, 30476

Site: 800 Area
UST #20

	Date	Hold Time
Date Sampled	08/01,04,05/03	NA
Receipt/Refrigeration	08/01,04,05/03	NA
Extraction		
1. TPHC	08/08/03	14 days
Analyses		
1. TPHC	08/12/03	40 days

000011



**CONFORMANCE/
NON-
CONFORMANCE
SUMMARY**

TPHC

000014



LABORATORY DELIVERABLES CHECKLIST AND NON-CONFORMANCE SUMMARY

THIS FORM MUST BE COMPLETED BY THE LABORATORY OR ENVIRONMENTAL CONSULTANT AND ACCOMPANY ALL DATA SUBMISSIONS

The following Laboratory Deliverables Checklist and Non-Conformance Summary shall be included in the data submission. All deviations from the accepted methodology and procedures, of performance values outside acceptable ranges shall be summarized in the Non-Conformance Summary. The Technical Requirements for Site Remediation, effective June 7, 1993, provides further details. The document shall be bound and paginated, contain a table of contents, and all pages shall be legible. Incomplete data packages will be returned or held without review until the data package is completed.

It is recommended that the analytical results summary sheets listing all targeted and non-targeted compounds with the method detection limits, practical quantitation limits, and the laboratory and/or sample numbers be included in one section of the data package and in the main body of the report.

1. Cover Page, Title Page listing Lab Certification #, facility name and address, & date of report submitted.
2. Table of Contents submitted.
3. Summary Sheets listing analytical results for all targeted and non-targeted compounds submitted.
4. Document paginated and legible.
5. Chain of Custody submitted.
6. Samples submitted to lab within 48 hours of sample collection.
7. Methodology Summary submitted.
8. Laboratory Chronicle and Holding Time Check submitted.
9. Results submitted on a dry weight basis.
10. Method Detection Limits submitted.
11. Lab certified by NJDEP for parameters of appropriate category of parameters or a member of the USEPA CLP.

✓
✓
✓
✓
✓
✓
✓
✓
✓
✓
✓

Laboratory Manager or Environmental Consultant's Signature
Date: 11 / 29 / 05

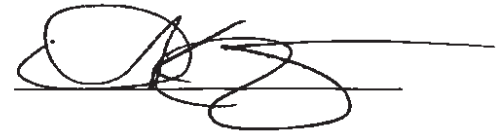
Laboratory Certification # 13461

*Refer to NJAC 7:26E – Appendix A, Section IV – Reduced Data Deliverables – Non-USEPA/CLP Methods for further guidance.



Laboratory Authentication Statement

I certify under penalty of law, where applicable, that this laboratory meets the Laboratory Performance Standards and Quality Control requirements specified in N.J.A.C. 7:18 and 40 CFR Part 136 for Water and Wastewater Analyses and SW-846 for Solid Waste Analysis. I have personally examined the information contained in this report and to the best of my knowledge, I believe that the submitted information is true, accurate, complete and meets the above referenced standards where applicable. I am aware that there are significant penalties for purposefully submitting falsified information, including the possibility of a fine and imprisonment.



Daniel K. Wright
Laboratory Manager

Attachment B
Soil Boring Logs and Well Construction Details

Soil Boring Log

CLIENT: <u>USACE</u> PROJECT NAME: <u>FTMM - ECP</u> PROJECT LOCATION: <u>FTMM Parcel 56-800-20</u> PROJECT NUMBER: <u>748810</u>	INSPECTOR: <u>F. ACCORSI</u> DRILLER: <u>S. FOSTER</u> WEATHER: <u>CLOUDY, 40'S</u> CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u>	BORING/WELL ID: <u>PAR-56-800-20-SCREEN1</u> LOCATION DESCRIPTION: LOCATION PLAN: Oceanport, New Jersey
GROUNDWATER OBSERVATIONS WATER LEVEL: <u>~ 7.5'</u> DATE: TIME: MEAS. FROM:		RIG TYPE: <u>Geoprobe(R) 7822DT</u> DATE/TIME START: <u>11-8-17 0900</u> DATE/TIME FINISH: <u>11-8-17 0930</u> WEIGHT OF HAMMER: <u>N/A</u> DROP OF HAMMER: <u>N/A</u> TYPE OF HAMMER: <u>N/A</u>

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			<u>60/42</u>	<u>0</u>	<u>0-3" TOPSOIL</u> <u>3"-42" moist, brn, cmf SAND,</u> <u>L. f. Gravel, L. silt</u>		
				<u>0</u>			
1				<u>0</u>			
				<u>0</u>			
2				<u>0</u>			
				<u>0</u>			
3				<u>0</u>			
				<u>0</u>			
4							
5			<u>60/48</u>	<u>0</u>	<u>0-30" (same)</u> <u>30"-48" WET, brn-gray-or. brn</u> <u>Silty Clay</u>		
				<u>0</u>			
6				<u>0</u>			
				<u>0</u>			
7				<u>0</u>			
				<u>0</u>			
8				<u>0</u>			<u>WET @ 7.5'</u>
				<u>0</u>			
9					<u>END OF BORING @ 10 FT</u>		
10							

Remarks:

Sample Types	Consistency vs. Blowcount / Foot			
	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
S - Split-Spoon	V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
U - Undisturbed Tube	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
C - Rock Core	M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30
A - Auger Cuttings				and - 35-50%
				some - 20-35%
				little - 10-20%
				trace - <10%
				moisture, density, color, gradation

Soil Boring Log

CLIENT: <u>USACE</u> PROJECT NAME: <u>FTMM - ECP</u> PROJECT LOCATION: <u>FTMM Parcel 56-800-12</u> PROJECT NUMBER: <u>748810-</u>	INSPECTOR: <u>F. ACCORSI</u> DRILLER: <u>S. FOSTER</u> WEATHER: <u>90'S, CLOUDY</u> CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u>	BORING/WELL ID: <u>PAR-56-800-20-SCREEN 2</u> LOCATION DESCRIPTION: LOCATION PLAN: Oceanport, New Jersey
GROUNDWATER OBSERVATIONS WATER LEVEL: <u>~ 9'</u> DATE: _____ TIME: _____ MEAS. FROM: _____		RIG TYPE: <u>Geoprobe(R) 7822DT</u> DATE/TIME START: <u>11-8-17 0940</u> DATE/TIME FINISH: <u>11-8-17</u> WEIGHT OF HAMMER: <u>N/A</u> DROP OF HAMMER: <u>N/A</u> TYPE OF HAMMER: <u>N/A</u>

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			<u>60/42</u>	<u>0</u>	<u>0-4" TOPSOIL</u> <u>4"-4" moist brn, cmf SAND,</u> <u>L: Silt, L.f. Gravel</u>		
				<u>0</u>			
1				<u>0</u>			
				<u>0</u>			
2				<u>0</u>			
				<u>0</u>			
3				<u>0</u>			
				<u>0</u>			
4							
5			<u>60/48</u>	<u>0</u>	<u>0-30' (same)</u> <u>36"-48" wet brn. silty clay</u>		
				<u>0</u>			
6				<u>0</u>			
				<u>0</u>			
7				<u>0</u>			
				<u>123</u>			
8				<u>2</u>			<u>WET @ 8'</u>
				<u>0</u>			
9							
10							

Remarks:

Sample Types	Consistency vs. Blowcount / Foot		and %
S -- Split-Spoon	Granular (Sand & Gravel)	Fine Grained (Silt & Clay)	35-50% 20-35% 10-20% <10% moisture, density, color, gradation
U -- Undisturbed Tube	V. Loose: 0-4 Dense: 30-50	V. Soft: <2 Stiff: 8-15	
C -- Rock Core	Loose: 4-10 V. Dense: >50	Soft: 2-4 V. Stiff: 15-30	
A -- Auger Cuttings	M. Dense: 10-30	M. Stiff: 4-8 Hard: >30	

Soil Boring Log

CLIENT: USACE PROJECT NAME: <u>PARCEL 56-800-20</u> PROJECT LOCATION: PROJECT NUMBER: 748810-	INSPECTOR: <u>F. ACCORSI</u> DRILLER: WEATHER: CONTRACTOR: <u>Geoprobe EODI</u> RIG TYPE: <u>Geoprobe(R) 7822DT</u> DATE/TIME START: <u>11-8-17</u> DATE/TIME FINISH: <u>11-8-17</u> WEIGHT OF HAMMER: <u>N/A</u> DROP OF HAMMER: <u>N/A</u> TYPE OF HAMMER: <u>N/A</u>	BORING/WELL ID: <u>PAR-56-800-20-SCREEN 2</u> LOCATION DESCRIPTION: LOCATION PLAN: Oceanport, New Jersey
--	--	---

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
1.0			00/60	7	0-18" (same)		
1.1				0			
1.2				0	18"-36" wet, yel brn cuf SAND, tr. silt		
1.3				0	36"-60" wet, blk clayey silt, organic		
1.4				0			
1.5				0			
1.6					END OF BORING @ 13 FT		
1.7							
1.8							
1.9							
1.0							

Remarks:

Sample Types S -- Split-Spoon U -- Undisturbed Tube C -- Rock Core A -- Auger Cuttings	Consistency vs. Blowcount / Foot <table style="width: 100%; font-size: small;"> <tr> <th colspan="2">Granular (Sand & Gravel)</th> <th colspan="2">Fine Grained (Silt & Clay)</th> </tr> <tr> <td>V. Loose: 0-4</td> <td>Dense: 30-50</td> <td>V. Soft: <2</td> <td>Stiff: 8-15</td> </tr> <tr> <td>Loose: 4-10</td> <td>V. Dense: >50</td> <td>Soft: 2-4</td> <td>V. Stiff: 15-30</td> </tr> <tr> <td>M. Dense: 10-30</td> <td></td> <td>M. Stiff: 4-8</td> <td>Hard: >30</td> </tr> </table>	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30	M. Dense: 10-30		M. Stiff: 4-8	Hard: >30	and - 35-50% some - 20-35% little - 10-20% trace - <10% moisture, density, color, gradation
Granular (Sand & Gravel)		Fine Grained (Silt & Clay)																
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15															
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30															
M. Dense: 10-30		M. Stiff: 4-8	Hard: >30															

Soil Boring Log

CLIENT: USACE PROJECT NAME: FTMM - ECP PROJECT LOCATION: FTMM Parcel 56-800-20 PROJECT NUMBER: 748810-	INSPECTOR: E. ACCORSI DRILLER: S. FOSTER WEATHER: CLDY, 40's CONTRACTOR: East Coast Drilling, Inc. (ECDI)	BORING/WELL ID: PAR-56-800-20-SCREEN 03 LOCATION DESCRIPTION LOCATION PLAN Oceanport, New Jersey
GROUNDWATER OBSERVATIONS WATER LEVEL: ≈ 7' DATE: TIME: MEAS. FROM:	RIG TYPE: Geoprobe(R) 7822DT DATE/TIME START: 11-8-17 1015 DATE/TIME FINISH: 11-8-17 1050 WEIGHT OF HAMMER: N/A DROP OF HAMMER: N/A TYPE OF HAMMER: N/A	

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/48	0	0-4" TOP SOIL		COAL PIECES
				0	4"-48" moist, brn cmf SAND, l. f. Gravel, l. silt		
1				0			
				0			
2				0			
				0			
				0			
3				0			
				0			
4							
5			60/56	0	0-40" moist, brn-g. brn cmf SAND, l. silt		WET @ 7.5'
				0			
6				0			
				0			
7				0			
				0			
8				14			
				15	40"-56" moist, brn silty CLAY		
9				0			
10					END OF BORING @ 10 FT		

Remarks:

Sample Types	Consistency vs. Blowcount / Foot		
	Granular (Sand & Gravel)	Fine Grained (Silt & Clay)	
S -- Split-Spoon	V. Loose: 0-4	V. Soft: <2	and - 35-50%
U -- Undisturbed Tube	Dense: 30-50	Stiff: 8-15	some - 20-35%
C -- Rock Core	Loose: 4-10	V. Stiff: 15-30	little - 10-20%
A -- Auger Cuttings	M. Dense: 10-30	Hard: > 30	trace - <10%
			moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE PROJECT NAME: FTMM - ECP PROJECT LOCATION: FTMM Parcel 56-800-20 PROJECT NUMBER: 748810-	INSPECTOR: F. ACCORSI DRILLER: S. FOSTER WEATHER: CLDY, 40'S CONTRACTOR: East Coast Drilling, Inc. (ECDI)	BORING/WELL ID: PAR-56-800-20-SCREEN 4 LOCATION DESCRIPTION LOCATION PLAN Oceanport, New Jersey
GROUNDWATER OBSERVATIONS WATER LEVEL: <u>~7'</u> DATE: _____ TIME: _____ MEAS. FROM: _____		RIG TYPE: Geoprobe(R) 7822DT DATE/TIME START: 11-8-17 1055 DATE/TIME FINISH: 11-8-17 1130 WEIGHT OF HAMMER: N/A DROP OF HAMMER: N/A TYPE OF HAMMER: N/A

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/54	0	0-4" TOP SOIL 1"-54" moist, cmf SAND, brn, l.f Gravel, l. Silt		
1				0			
2				0			ASPHALT 0 2.5'
3				0			
4				0			
5			60/48	0	0-48" (SAND)		
6				0			
7				0			WET 07'
8				0			
9				0			
10					END OF BORING @ 10 FT		

Remarks:

Sample Types	Consistency vs. Blowcount / Foot		
S - Split-Spoon U - Undisturbed Tube C - Rock Core A - Auger Cuttings	Granular (Sand & Gravel) V. Loose: 0-4 Dense: 30-50 Loose: 4-10 V. Dense: >50 M. Dense: 10-30	Fine Grained (Silt & Clay) V. Soft: <2 Stiff: 8-15 Soft: 2-4 V. Stiff: 15-30 M. Stiff: 4-8 Hard: >30	and - 35-50% some - 20-35% little - 10-20% trace - <10% moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE PROJECT NAME: FTMM - ECP PROJECT LOCATION: FTMM Parcel <u>56-900-20</u> PROJECT NUMBER: 748810-	INSPECTOR: <u>F. ACCORSI</u> DRILLER: <u>S. FOSTER</u> WEATHER: <u>CLOUDY, 40'S</u> CONTRACTOR: East Coast Drilling, Inc. (ECDI) RIG TYPE: Geoprobe(R) 7822DT DATE/TIME START: <u>11-8-17</u> DATE/TIME FINISH: <u>11-8-17</u> WEIGHT OF HAMMER: <u>N/A</u> DROP OF HAMMER: <u>N/A</u> TYPE OF HAMMER: <u>N/A</u>	BORING/WELL ID: <u>PAR-56-900-20-SCREEN 5</u> LOCATION DESCRIPTION: LOCATION PLAN: Oceanport, New Jersey
GROUNDWATER OBSERVATIONS WATER LEVEL: <u>~9'</u> DATE: TIME: MEAS. FROM:		

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			<u>60/48</u>	<u>0</u>	<u>0-3" TOPSOIL 3"-36" moist, brn, cmf SAND, l.f Gravel, l. silt</u>		
				<u>0</u>			
1				<u>0</u>			
				<u>0</u>			
2				<u>0</u>			
				<u>0</u>	<u>36"-48" moist, brn, cmf SAND</u>		
3				<u>0</u>			
				<u>0</u>			
4							
					<u>0-42" moist, brn - or. brn, cmf SAND, l.s. mf Gravel</u>		
5		<u>60/54</u>		<u>0</u>			
				<u>0</u>			
6				<u>0</u>			
				<u>0</u>			
7				<u>0</u>			
				<u>0</u>	<u>42"-59" moist, brn silty Clay</u>		
8				<u>0</u>			
				<u>0</u>			
9				<u>0</u>			
10					<u>END OF BORING @ 10 FT.</u>		

Remarks:

Sample Types S - Split-Spoon U - Undisturbed Tube C - Rock Core A - Auger Cuttings	Consistency vs. Blowcount / Foot		and - 35-50% some - 20-35% little - 10-20% trace - <10% moisture, density, color, gradation
	Granular (Sand & Gravel) V. Loose: 0-4 Loose: 4-10 M. Dense: 10-30	Dense: 30-50 V. Dense: >50	

Soil Boring Log

CLIENT: USACE PROJECT NAME: FTMM - ECP PROJECT LOCATION: FTMM Parcel 56-900-20 PROJECT NUMBER: 748810-	INSPECTOR: F. ACCORSI DRILLER: S. FOSTER WEATHER: CLOUDY, 40'S CONTRACTOR: East Coast Drilling, Inc. (ECDI)	BORING/WELL ID: PAR-56-900-20-SCREEN06 LOCATION DESCRIPTION LOCATION PLAN Oceanport, New Jersey
GROUNDWATER OBSERVATIONS WATER LEVEL: _____ DATE: _____ TIME: _____ MEAS. FROM: _____	RIG TYPE: Geoprobe(R) 7822DT DATE/TIME START: 11-8-17 1140 DATE/TIME FINISH: 11-8-17 1200 WEIGHT OF HAMMER: N/A DROP OF HAMMER: N/A TYPE OF HAMMER: N/A	

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/58	0	0-3' TOPSOIL 3'-58" moist, brn, cmf SAND l. f. Gravel, l. silt		
				0			
1				0			
				0			
2				0			
				0			
3				0			
				0			
4				0			
				0			
5			60/48	0	0-30" (SAME)		
				0			
6				0			
				0			
7				0			
				0	30% moist, yel brn clayey silt		
8				0			
				0			
9							
							wet @ 8'
10					END OF BORING @ 10 FT.		

Remarks:

Sample Types S -- Split-Spoon U -- Undisturbed Tube C -- Rock Core A -- Auger Cuttings	Consistency vs. Blowcount / Foot	and - 35-50% some - 20-35% little - 10-20% trace - <10% moisture, density, color, gradation																
	<table style="width: 100%; border: none;"> <tr> <td colspan="2" style="border: none;">Granular (Sand & Gravel)</td> <td colspan="2" style="border: none;">Fine Grained (Silt & Clay)</td> </tr> <tr> <td style="border: none;">V. Loose: 0-4</td> <td style="border: none;">Dense: 30-50</td> <td style="border: none;">V. Soft: <2</td> <td style="border: none;">Stiff: 8-15</td> </tr> <tr> <td style="border: none;">Loose: 4-10</td> <td style="border: none;">V. Dense: >50</td> <td style="border: none;">Soft: 2-4</td> <td style="border: none;">V. Stiff: 15-30</td> </tr> <tr> <td style="border: none;">M. Dense: 10-30</td> <td style="border: none;"></td> <td style="border: none;">M. Stiff: 4-8</td> <td style="border: none;">Hard: > 30</td> </tr> </table>	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30	M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30	
Granular (Sand & Gravel)		Fine Grained (Silt & Clay)																
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15															
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30															
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30															

Soil Boring Log

CLIENT: <u>USACE</u> PROJECT NAME: <u>FTMM - ECP</u> PROJECT LOCATION: <u>FTMM Parcel 56-800-20</u> PROJECT NUMBER: <u>748810-</u>	INSPECTOR: <u>F. ACCORSI</u> DRILLER: <u>S. FOSTER</u> WEATHER: <u>Cloudy, 40's</u> CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u> RIG TYPE: <u>Geoprobe(R) 7822DT</u> DATE/TIME START: <u>11-8-17 1415</u> DATE/TIME FINISH: <u>11-8-17 1445</u> WEIGHT OF HAMMER: <u>N/A</u> DROP OF HAMMER: <u>N/A</u> TYPE OF HAMMER: <u>N/A</u>	BORINGWELL ID: <u>PAR-56-800-20-TMW-01</u> LOCATION DESCRIPTION: <u>RE LOCATED 50' WEST OF TMW 03</u> LOCATION PLAN: <u>Oceanport, New Jersey</u>
GROUNDWATER OBSERVATIONS WATER LEVEL: <u>~ 12'</u> DATE: _____ TIME: _____ MEAS. FROM: _____		

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0				0	0-4" TOP SOIL		
				0	4"-30" moist, brn-dr. brn cmf SAND, t. silt		
1				0			
				0			
2				0			
				0	30"-40" moist grn brn cmf SAND and cmf gravel		
3				0			
4							
5				0	0-40" moist, brn, cmf SAND		
				0	some f. gravel, l. silt		
6				0			
				0			
7				0			
				0			
8				0	40"-48" moist, brn, m f SAND, some silt		
				0			
9							
10							

Remarks:

Sample Types	Consistency vs. Blowcount / Foot		
S - Split-Spoon	Granular (Sand & Gravel)	Fine Grained (Silt & Clay)	
U - Undisturbed Tube	V. Loose: 0-4 Dense: 30-50	V. Soft: <2 Stiff: 8-15	and - 35-50%
C - Rock Core	Loose: 4-10 V. Dense: >50	Soft 2-4 V. Stiff: 15-30	some - 20-35%
A - Auger Cuttings	M. Dense: 10-30	M. Stiff: 4-8 Hard: > 30	little - 10-20%
			trace - <10%
			moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE PROJECT NAME: <u>FTMM PARCEL 56-800-20</u> PROJECT LOCATION: PROJECT NUMBER: 748810-	INSPECTOR: <u>F. ACCORSI</u> DRILLER: <u>S. FOSTER</u> WEATHER: CONTRACTOR: <u>Cascade ECDI</u> RIG TYPE: <u>Geoprobe(R) 7822DT</u> DATE/TIME START: <u>11-8-17</u> DATE/TIME FINISH: <u>11-8-17</u> WEIGHT OF HAMMER: <u>N/A</u> DROP OF HAMMER: <u>N/A</u> TYPE OF HAMMER: <u>N/A</u>	BORINGWELL ID: <u>PAR-56-800-20-TMW-03</u> LOCATION DESCRIPTION: <u>01</u> LOCATION PLAN Oceanport, New Jersey
GROUNDWATER OBSERVATIONS WATER LEVEL: DATE: TIME: MEAS. FROM:		

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
1.0					NO SOIL SAMPLES - DRILLER RAN OUT OF ACETATE LINERS FOR MACRO-CORE SAMPLER. PUSHED POINT TO 15 FT. AND SET TMW.		
1.1							
1.2							
1.3	<u>PAR-56-800-20-TMW-03-13'</u>						
1.4							
1.5					END OF BORING @ 15 FT TMW (10 FT, SCREEN) SET FROM 5' TO 10' 15' FT		
___6							
___7							
___8							
___9							
___0							

Remarks:

Sample Types	Consistency vs. Blowcount / Foot		
S - Spill-Spoon U - Undisturbed Tube C - Rock Core A - Auger Cuttings	Granular (Sand & Gravel) V. Loose: 0-4 Dense: 30-50 Loose: 4-10 V. Dense: >50 M. Dense: 10-30	Fine Grained (Silt & Clay) V. Soft: <2 Stiff: 8-15 Soft: 2-4 V. Stiff: 16-30 M. Stiff: 4-8 Hard: >30	and - 35-50% some - 20-35% little - 10-20% trace - <10% moisture, density, color, gradation

Soil Boring Log

CLIENT: <u>USACE</u> PROJECT NAME: <u>FTMM - ECP</u> PROJECT LOCATION: <u>FTMM (Parcel) 56-800-20</u> PROJECT NUMBER: <u>748810-</u>	INSPECTOR: <u>F. Accorsi</u> DRILLER: <u>S. FOSTER</u> WEATHER: <u>CLOUDY, 40'S</u> CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u>	BORING/WELL ID: <u>PAR-56-800-20-TMW-02</u> LOCATION DESCRIPTION: LOCATION PLAN: Oceanport, New Jersey
GROUNDWATER OBSERVATIONS WATER LEVEL: <u>~10 FT.</u> DATE: TIME: MEAS. FROM:	RIG TYPE: <u>Geoprobe(R) 7822DT</u> DATE/TIME START: <u>11-8-17 1400</u> DATE/TIME FINISH: <u>11-8-17</u> WEIGHT OF HAMMER: <u>N/A</u> DROP OF HAMMER: <u>N/A</u> TYPE OF HAMMER: <u>N/A</u>	

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/54	0	0-4" TOP SOIL		
				0	4"-42" moist, brn, cmf SAND, l. s. gravel		
1				0			
				0			
2				0			
				0			
3				0			
				0	42"-59" moist, brn cmf SAND, and cmf gravel		
4				0			
				0			
5			60/60	0	0-36" moist, brn, cmf SAND, l. silt, l. gravel		
				0			
6				0			
				0			
7				0			
				0			
8				0	36"-60" wet, brn-yel brn clayey silt		wet @ 8'
				0			
9				0			
				0			
10							

Remarks:

Sample Types	Consistency vs. Blowcount / Foot		
	Granular (Sand & Gravel)	Fine Grained (Silt & Clay)	
S -- Split-Spoon	V. Loose: 0-4	V. Soft: <2	and - 35-50%
U -- Undisturbed Tube	Dense: 30-50	Stiff: 8-15	some - 20-35%
C -- Rock Core	Loose: 4-10	Soft: 2-4	little - 10-20%
A -- Auger Cuttings	V. Dense: >50	V. Stiff: 15-30	trace - <10%
	M. Dense: 10-30	Hard: >30	moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE PROJECT NAME: EMM PARCEL 56-800-20 PROJECT LOCATION: PROJECT NUMBER: 748810-	INSPECTOR: F. ACCORSI DRILLER: WEATHER: CONTRACTOR: Cascade FCDI RIG TYPE: Geoprobe(R) 7822DT DATE/TIME START: DATE/TIME FINISH: WEIGHT OF HAMMER: N/A DROP OF HAMMER: N/A TYPE OF HAMMER: N/A	BORING/WELL ID: PAR-56-800-20-TMW-02 LOCATION DESCRIPTION: LOCATION PLAN: Oceanport, New Jersey
GROUNDWATER OBSERVATIONS WATER LEVEL: DATE: TIME: MEAS. FROM:		

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10			60/48	0	0-16" moist, brn-oo, brn conf SAND, l. f. Gravel		
11				0	16"-28" moist, brn silty Clay		
12				0			
13	PAR-56-800-20-TMW-02-13'			0	28"-48" wet, gray, SILT and f. sand		
14				0			
15					END OF BORING @ 15 FT. TMW (10 FT. SCREEN) SET FROM 5' TO 15'		
16							
17							
18							
19							
20							

Remarks:

Sample Types	Consistency vs. Blowcount / Foot	
S -- Split-Spoon	Granular (Sand & Gravel)	and - 35-50%
U -- Undisturbed Tube	Fine Grained (Silt & Clay)	some - 20-35%
C -- Rock Core	V. Loose: 0-4 Dense: 30-50 V. Soft: <2 Stiff: 8-15	little - 10-20%
A -- Auger Cuttings	Loose: 4-10 V. Dense: >50 Soft: 2-4 V. Stiff: 15-30	trace - <10%
	M. Dense: 10-30 M. Stiff: 4-8 Hard: > 30	moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE PROJECT NAME: FTMM - ECP PROJECT LOCATION: FTMM Parcel 36-800-20 PROJECT NUMBER: 748810-	INSPECTOR: F. ACCORSI DRILLER: S. FOSTER WEATHER: CLOUDY, 40'S CONTRACTOR: East Coast Drilling, Inc. (ECDI) RIG TYPE: Geoprobe(R) 7822DT DATE/TIME START: 11-8-16 1345 DATE/TIME FINISH: 11-8-16 1510 WEIGHT OF HAMMER: N/A DROP OF HAMMER: N/A TYPE OF HAMMER: N/A	BORING/WELL ID: PAR-56 800-20-FW-03 LOCATION DESCRIPTION LOCATION PLAN Oceanport, New Jersey
GROUNDWATER OBSERVATIONS		
WATER LEVEL: <u>~10'</u>		
DATE: _____		
TIME: _____		
MEAS. FROM: _____		

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/36	0	0-3" TOPSOIL		
				0	3"-36" moist, brn, or. brn, cmf SAND, ta. silt		
1				0			
				0			
2				0			
				0			
3							
4							
5			60/60	0	0-30" moist, brn cmf SAND, 9nd cmf Gravel		
				0			
6				0			
				0			
7				0			
				0			
8				0	30"-60" moist, brn-or. brn cmf SAND, L. silt		
				0			
9				0			
				0			
10							wet @ 10'

Remarks:

Sample Types S - Split-Spoon U - Undisturbed Tube C - Rock Core A - Auger Cuttings	Consistency vs. Blowcount / Foot <table style="width: 100%; font-size: small;"> <tr> <th colspan="2">Granular (Sand & Gravel)</th> <th colspan="2">Fine Grained (Silt & Clay)</th> </tr> <tr> <td>V. Loose: 0-4</td> <td>Dense: 30-50</td> <td>V. Soft: <2</td> <td>Stiff: 8-15</td> </tr> <tr> <td>Loose: 4-10</td> <td>V. Dense: >50</td> <td>Soft: 2-4</td> <td>V. Stiff: 15-30</td> </tr> <tr> <td>M. Dense: 10-30</td> <td></td> <td>M. Stiff: 4-8</td> <td>Hard: > 30</td> </tr> </table>	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30	M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30	and - 35-50% some - 20-35% little - 10-20% trace - <10% moisture, density, color, gradation
Granular (Sand & Gravel)		Fine Grained (Silt & Clay)																
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15															
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30															
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30															

Soil Boring Log

CLIENT: USACE PROJECT NAME: <u>ETM PARCEL 56-800-20</u> PROJECT LOCATION: PROJECT NUMBER: 748810-	INSPECTOR: <u>F. ACCORSI</u> DRILLER: WEATHER: CONTRACTOR: <u>Cascade ECDI</u> RIG TYPE: <u>Geoprobe(R) 7822DT</u> DATE/TIME START: <u>11-8-17</u> DATE/TIME FINISH: <u>11-8-17</u> WEIGHT OF HAMMER: <u>N/A</u> DROP OF HAMMER: <u>N/A</u> TYPE OF HAMMER: <u>N/A</u>	BORING/WELL ID: <u>PAR-56-800-20-TMW-03</u> LOCATION DESCRIPTION: LOCATION PLAN: Oceanport, New Jersey
GROUNDWATER OBSERVATIONS WATER LEVEL: <u>≈ 10'</u> DATE: TIME: MEAS. FROM:		

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10			60%		NO RETURNS - ACETATE SLEEVE COLLAPED.		
11							
12							
13	PAR-56-800-20-TMW-03-13'						
14							
15					END OF BORING @ 15 FT. TMW (60 FT. SCREEN) SET FROM 5' - 15'		
16							
17							
18							
19							
20							

Remarks:

Sample Types S -- Split-Spoon U -- Undisturbed Tube C -- Rock Core A -- Auger Cuttings	Consistency vs. Blowcount / Foot	and - 35-50% some - 20-35% little - 10-20% trace - <10% moisture, density, color, gradation																
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Granular (Sand & Gravel)</th> <th colspan="2">Fine Grained (Silt & Clay)</th> </tr> <tr> <td>V. Loose: 0-4</td> <td>Dense: 30-50</td> <td>V. Soft: <2</td> <td>Stiff: 8-15</td> </tr> <tr> <td>Loose: 4-10</td> <td>V. Dense: >50</td> <td>Soft: 2-4</td> <td>V. Stiff: 15-30</td> </tr> <tr> <td>M. Dense: 10-30</td> <td></td> <td>M. Stiff: 4-8</td> <td>Hard: > 30</td> </tr> </table>	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30	M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30	
Granular (Sand & Gravel)		Fine Grained (Silt & Clay)																
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15															
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30															
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30															

Well Construction Detail (Single Cased - Stickup)

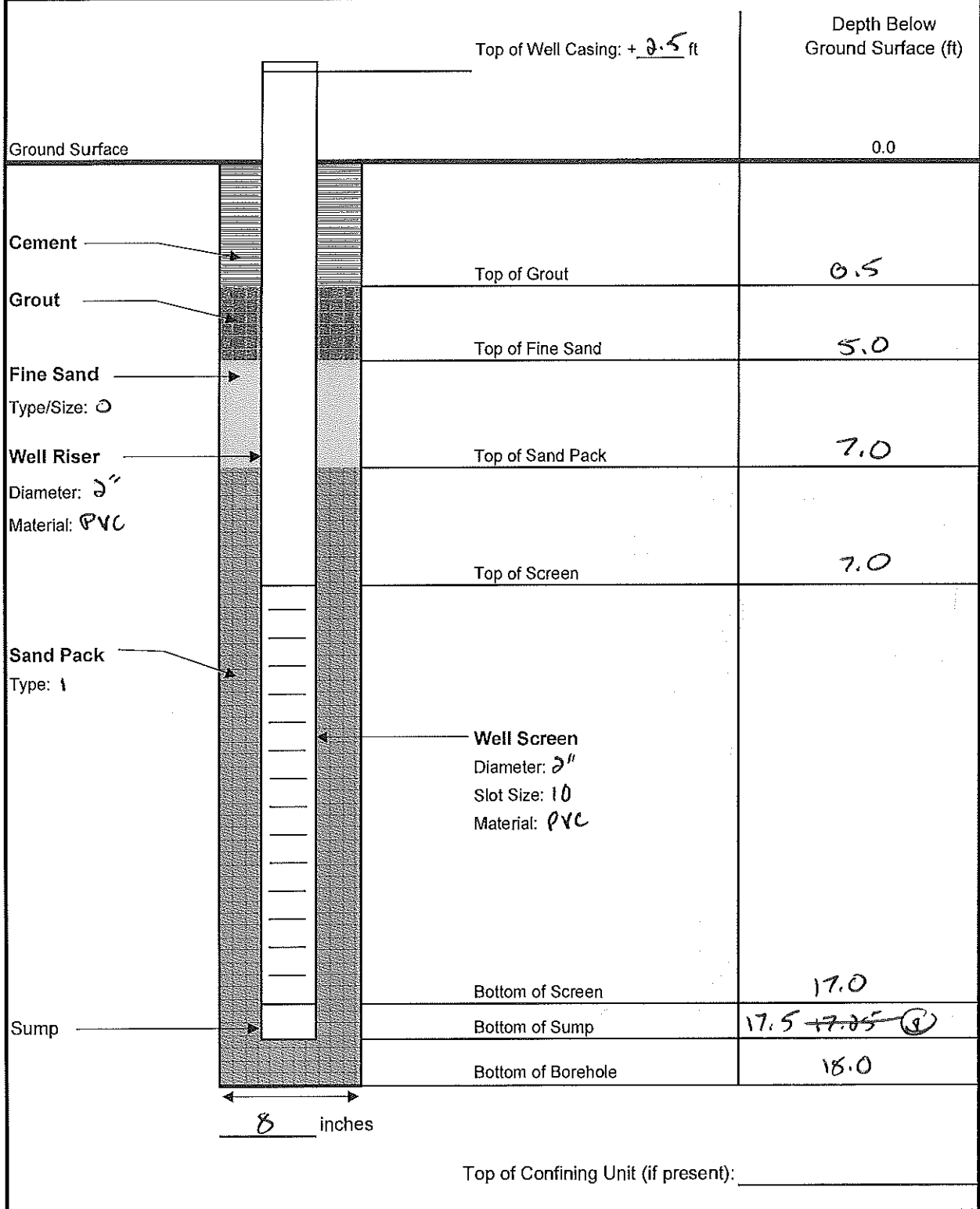
Client: USACE

Well ID: 800-20-MW-01

NJBWA Permit No.

Date Well Installed: 11/17/17

Location: PAR-56-800-20-MW-01



Well Construction Detail (Single Cased - Stickup)

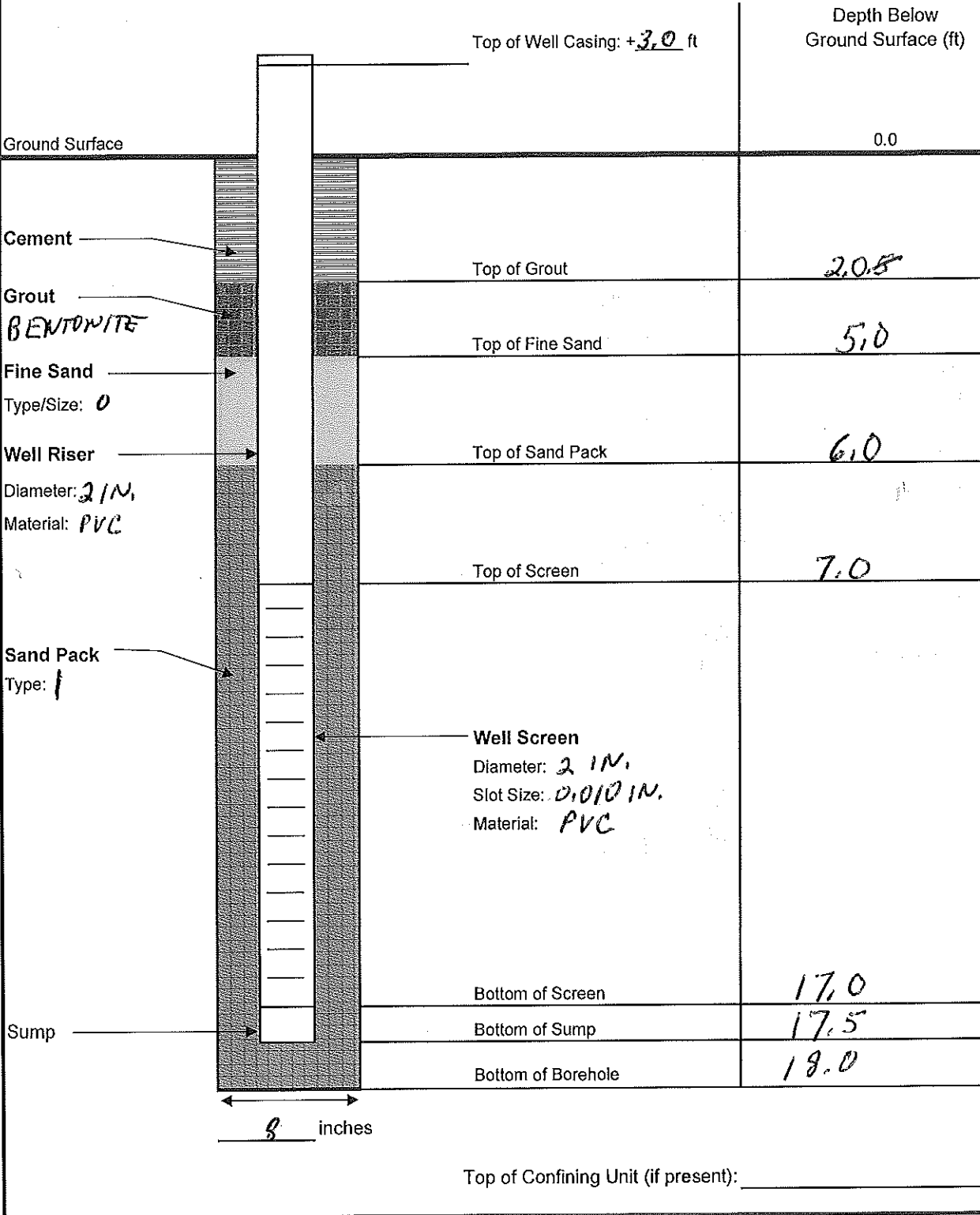
Client: USACE

Well ID: *PAR-56-800-20-MW-02*

NJBWA Permit No.

Date Well Installed: *12-13-17*

Location: *PARCEL 56, FTMM*



Soil Boring Log

CLIENT: USACE PROJECT NAME: FTMM - ECP PROJECT LOCATION: FTMM Parcel 56-800-20 PROJECT NUMBER: 748810-	INSPECTOR: F. ACCORSI DRILLER: K. ATWOOD, T. McMALEY WEATHER: WINDY, SUNNY, 20'S CONTRACTOR: East Coast Drilling, Inc. (ECDI)	BORING/WELL ID: PAR-56-900-20-MW-02 LOCATION DESCRIPTION LOCATION PLAN Oceanport, New Jersey
GROUNDWATER OBSERVATIONS WATER LEVEL: $\approx 10.5'$ DATE: TIME: MEAS. FROM:	RIG TYPE: Geoprobe(R) 7822DT DATE/TIME START: 12-13-17 0800 DATE/TIME FINISH: 12-13-17 1100 WEIGHT OF HAMMER: N/A DROP OF HAMMER: N/A TYPE OF HAMMER: N/A	

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0					HOLLOW STEM AUGERED TO 18'. MOIST, BROWN-GREEN BROWN SILTY SAND, GMF GRAVEL AT 4'-6" AND 8'-10" PID READINGS FROM SOIL CUTTINGS: 0 PPM. SOIL BECOMING CLAYEY FROM 13'-17'		WET @ 11'
1							
2							
3							
4							
5					END OF BORING AT 18 FT SEE WELL CONSTRUCTION DETAIL		
6							
7							
8							
9							
10							

Remarks:

Sample Types	Consistency vs. Blowcount / Foot		
S - Split-Spoon	Granular (Sand & Gravel)	Fine Grained (Silt & Clay)	and - 35-50% some - 20-35% little - 10-20% trace - <10% moisture, density, color, gradation
U - Undisturbed Tube	V. Loose: 0-4 Dense: 30-50	V. Soft: <2 Stiff: 8-15	
C - Rock Core	Loose: 4-10 V. Dense: >50	Soft: 2-4 V. Stiff: 15-30	
A - Auger Cuttings	M. Dense: 10-30	M. Stiff: 4-8 Hard: >30	

Attachment C
Field Notes

Nov. 7 2017

personnel: F. Accorsi, B. Dietert, ECDI (Sean, Roman)

Task: GW & Soil Sampling, PID screening
at UHOT, Parcel, & IRP sites. - Complete
PID screening at Parcel 72 & GW sampling,
Mob to Parcel 68 (UST 906A).

Weather: 45-55°, partly cloudy, afternoon rain

0745: ECDI onsite

0755: H4S Meeting, Discuss Agenda

0825: Load Equip, prep bottles & coolers,
Calibrate PID (mini-Roe), Geoprobe (ECDI),
Disposable Teflon Bailers. All GW
samples collected using teflon bailer.

0825: ECDI to Lowe's for supplies.

0845: Mob to PAR-72-211

- pickup decon supplies (bags, drum)

0850: ECDI back at FTMM. Warm-up Geoprobe.

0900: Begin drilling PAR-72-211-TMW-05

0915: Start PID screening TMW-05 WL=7.5'

0916: 211-TMW-02, 03, and 06
decommissioned, backfilled with
soil cuttings.

0920: Spoke with Julian about change
of agenda at PAR-72-211

Julian - No samples at TMW-05, only PID
screening ~0-10 ft. Relocate
SCREEN 7 south of screen 2
since screens 1, 2, and 3 indicated

Nov. 7 2017 (cont.)

high PID readings⁸⁰

- Justification for eliminating TMW-05,
no PID hits on TMW-02, 03, & 04.

Julian
Eliminate SCREEN 5, 6, and 7,
Move SCREEN 7 & SCREEN 5 south
of Bldg. 211 near Sherrill Ave & rename.

Justification - Delineate south of
bldg. 211 since SCREEN 1, 2, 3 indicated
high PID readings. Label well
south of SCREEN 2 (approx 30')
TMW-07, do PID
screening & collect GW samples (VOC, SVOC).
Label well approx. 30' south of SCREEN 3
SCREEN 8 - collect PID reading, but no
GW samples.

0940: Contacted Utiliqvest for dig-safe
mark out. Enrt from offsite.

0945: No PID readings ≥ 0 ppm ~0-10 ft
on TMW-05.

0950: SCREEN 3 GPS location marked
incorrectly on map. Actual screening
location is approx. 10' south of garage
bldg directly adjacent to concrete pad.

1030: Decommissioned TMW-05, backfilled
hole with soil cuttings, decon Geoprobe

1040: Utiliqvest on-site, marked utilities

1100: Start drilling PAR-72-211-TMW-07

1107: Begin PID screening TMW-07

Nov 7 2017 (cont.)

- 1115: No PID > 0 ppm ~ 0-10 ft. WL=5.05'
1118: Geoprobe mob off Trow-07, decon.
1125: Collect samples PAR-72-211-TMW-07-10',
VOC+TICS & SVOC+TICS (High NTU-silty)
"Chocolate milk"
1135: Begin drilling PAR-72-211-SCREEN 8
1150: No PID > 0 ppm ~ 0-10 ft WL=5.0'
1152: ECDI decon Geoprobe, enrt. to lunch
1215: Enroute to office to drop off
samples for lab courier.
1230: ECDI back on-site
1235: mob to Par-68-906A
1237: PAR-72-211: TMW-07 & SCREEN 8
decommissioned, backfilled with soil cuttings.
1240: Lunch
1255: Start drilling PAR-68-906A-SB-07
1300: Begin PID SB-07 (partial recovery)
3' = 81 ppm, 3.5' = 45 ppm, 0-3' = 0 ppm
5' = 65 ppm, 5.5' = 124, 6' = 125 ppm
6.5' = 7 ppm, 7' = 46 ppm, 7.5' = 2.4 ppm
10' = 8 ppm, 10.5' = 1 ppm, 11' = 0.8 ppm,
* 11.5' - 15' = 0 ppm
1325: Collect soil sample, PAR-68-906A-SB-07-
1.5'-2.0', Unfrac. EPH & Naph, 2-Methyl
(Extract & Hold)
1328: Collect soil sample, Par-68-906A-SB-07-11.5'-12.0',
Unfrac EPH & Naph, 2-Methyl (Extract & Hold)

Nov 7 2017 (cont.)

- 1335: Collect soil sample, PAR-72-906A-SB-07-5.5'-6.0',
Unfrac EPH & Naph, 2-Methyl (Extract & Hold)
1340: Decon Equip & Geoprobe
1342: Decommission SB-07, backfilled with
soil cuttings.
1345: Start drilling PAR-68-906A-TMW-03
1350: Begin PID screening WL=7.4' (TMW-03)
1353: Decon Geoprobe
1357: Begin drilling PAR-68-906A-TMW-~~03~~⁰⁵
1403: No PID > 0 ppm ~ 0-15 ft TMW-03
1405: Collect sample, PAR-68-906A-TMW-03-11',
VOC+TICS & SVOC+TICS (Turbid-light brown)
amber colored.
1415: Begin PID screening TMW-~~03~~⁰⁵, Decon Geoprobe
1420: Start drilling TMW-~~03~~⁰⁴, hole drilled
approx. 3 ft SE of mapped location
due to concrete ramp.
1440: No PID hits > 0 ppm TMW-05 ~ 0-15 ft.
WL=5.0' TMW-05
1448: Collect sample, PAR-68-906A-TMW-05-10',
VOCs+TICS & SVOC+TICS (High NTU;
~~dark~~^{dark} "chocolate" color
1505: Begin PID screening TMW-04 WL=5.5'
1511: No PID hits > 0 ppm ~ 0-15 ft
1520: Collect samples, PAR-68-906A-TMW-04-10',
VOCs+TICS & SVOC+TICS (Turbid-light
brown-amber color)

1530: PAR-68-906A - TMW-03 & 05
decommissioned, backfilled with
soil cuttings.

1536: ECDI departing

1545: Mob back to office, prepare
COCs, samples for shipping,
Quality Control Report, Clean-up.

~~11/2/17 BD~~

Nov 8 2017 (cont.)

- 1005: Lab samples from 11/7/17 picked up by ALS (Emma).
- 1010: Mob back to PAR-56-800-20 site.
- 1018: Start drilling 800-20-SCREEN 3.
- 1030: Begin PID screening SCREEN 3 WL=7.1'
0-5' = 0 ppm, 8' = 14 ppm, 8.5' = 15 ppm,
9-10' = 0 ppm.
- 1043: Decon equipt, Decon Geoprobe.
- 1050: Decommission SCREEN 2, backfill with soil cuttings.
- 1054: Start drilling 800-20-SCREEN 4
- 1058: Decommission SCREEN 3, backfill with soil cuttings.
- 1100: Begin PID screening SCREEN 4 WL=7.1'
- 1105: No PID hits > 0 ppm ~ 0-10 ft.
- 1105: Decon Geoprobe.
- 1107: Start drilling 800-20-SCREEN 5
- 1110: Begin PID screening SCREEN 5 WL= ~~7.1~~ ^{dry} ~~7.1~~ at 10'
- 1119: No PID hits > 0 ppm ~ 0-10 ft.
- 1124: Decon Geoprobe.
- 1128: Decommission SCREEN 4, backfilled with soil cuttings.
- 1133: Start drilling 800-20-SCREEN 6
- 1138: Begin PID screening SCREEN 6 WL=dry to 10'
- 1140: Decon Geoprobe.
- 1143: Decommission SCREEN 5, backfill hole with soil cuttings.

Nov 8 2017 (cont.)

- 1155: No PID hits > 0 ppm SCREEN 6 ~ 0-10'
- 1155: ECDI to Lunch
- 1205: To office - Lunch
- 1250: Mob back to PAR-~~56~~⁵⁶₈₀-800-20
- 1300: Decommission SCREEN 6, backfill with soil cuttings.
- 1300: Spoke with Julien - Since SCREEN 2 & 3 are dirty, start with drilling TMW-02 First. IF TMW-02 is dirty, keep TMW-01 + TMW-03 in same location. IF TMW-02 is clean, relocate TMW-01 approx. 50 ft East of TMW-03 near Tindell Ave. IF TMW 01, 02, & 03 are clean, eliminate TMW-04.
- 1303: Start drilling PAR-~~56~~⁵⁶₈₀-800-20-TMW-02
- 1315: Begin PID screening TMW-02 WL=10.7'
- 1317: Decon Geoprobe
- 1321: No PID hits > 0 ppm ~ 0-15 ft
- 1325: Begin drilling TMW-03
- 1330: Collect Gw sample, ⁸⁰ ~~TMW~~ PAR-~~56~~⁵⁶₈₀-800-20-TMW-02-13', VOC+TICS & SVOC+TICS
- 1335: Start PID screening TMW-03 WL=12.2'
- 1340: TMW-02 minimal to slow recharge, water level static. VOCs & partial SVOC so far.
- 1343: No PID hits > 0 ppm TMW-03 0-10', 10-15' sleeve collapsed, jammed in liner.

Nov 8 2017 (cont)

- 1410: Collect sample, PAR-~~80~~^{TC}_{BD}-800-20-TMW-03-13', VOCs + TICs + SVOC + TICs WL=11.5'
- 1411: Start drilling ~~FW~~^{BD} TMW-01, relocated approx. 50' East of TMW-03 near Tindell Ave.
- 1415: TMW-02 sample High NTU, dark grey color.
- 1423: Begin PID screening TMW-01, WL=11.4' decon Geoprobe.
- 1430: No PID hits > 0 ppm TMW-01 ~ 0-10 ft.
- 1445: ECDI ran out of acetate liners.
- 1445: Spoke with Julien, advised eliminate TMW-04 since TMW-01, 02, & 03 are clean & already downgradient.
- 1450: TMW-03 slow recharge, water moderate NTU - light grey color.
- 1450: ECDI shut down Geoprobe since ran out of liners.
- 1457: ECDI departing FTM.
- 1500: Collect sample, PAR-~~80~~^{TC}_{BD}-800-20-TMW-01-13', VOC + TICs + SVOC + TICs
- 1500: TMW-03 sample completed.
- 1515: High NTU TMW-01, brownish-green color. Slow recharge.
- 1552: TMW-01 & TMW-02 samples complete.
- 1600: Mob back to office. Prepare COCs & paperwork.

Nov 8 2017 (cont)

- * GPS coordinates need to be updated on maps for:
- PAR-72-211-SCREEN 3: Actual soil boring location was approx. 10 ft south of garage adjacent to the concrete pad.
 - PAR-72-211-SCREEN 8 was added approx. 30' south of SCREEN 3 (PID hot) (replaced screen 5, 6, & 7)
 - PAR-72-211-TMW-07 was added approx. 30' south of SCREEN 2 (PID hot) & replaced TMW-05 site.
 - PAR-~~80~~^{TC}_{BD}-800-20-TMW-01 was relocated approx. 50' east of TMW-03.
 - PAR-~~80~~^{TC}_{BD}-800-20-TMW-04 was eliminated from sampling since TMW-01, 02, & 03 were all clean & already downgradient.

BOD

11/8/17

Daily Contractor Quality Control Report

Contract Number: W912DY-09-D-0062
 Delivery Order Number: 12
 Project Name: FTMM
 Project Number: 748810
 Site Location: Oceanport and Monmouth County, NJ

Date: 11/8/2017

Weather: 40-50°, cloudy & cold

Field Activities Conducted: Complete GW Sampling & Soil PID Screening at PAR-56-800-20 ^{UST Site}

Work Planned next work day: GW Sampling & Soil PID Screening at PAR-55-800-12 (UST Site)

Field Instrument Measurements (list or provide attachment): see attached boring logs/field notes

Equipment Calibrations (list or provide attachment): see attached calibration log

List all field and quality control samples collected (list or provide attachment): see below + CoC

Sample ID	Matrix	Collection Date & Time	Analyses	Shipment Date	Lab	Comments
PAR-56-800-20-TMW-01-13'	GW	11/8/17 1500	VOC + TICs SVOC + TICs	11/9/17	ALS	
PAR-56-800-20-TMW-02-13'	↓	11/8/17 1330	↓	↓	↓	
PAR-56-800-20-TMW-03-13'	↓	11/8/17 1410	↓	↓	↓	
—	↓	—	—	↓	↓	
	TB	11/8/17	VOC + TICs	↓	↓	

- Table listing all field/QC samples collected
- Field sampling forms (in separate submittal).
- Field-generated analytical results
- Chain-of-custody forms (signed CoC will be posted to the Denver server).

Signed by: Bradly Dietest

Name (print): Bradly Dietest

Date: 11/8/2017

Phone Number: _____

Copies sent to: C. Grill, J. Chamberst, L. Weber, K. Frieser

Location FTMM Date 11-15-17
 Project / Client USACE
PAR 83

1415 BEGIN PUSHING AT SB-38.
 1430 CREW BACKFILLS OPEN HOLES AND
 CLEANS AREA.
 1475 CREW LOADS TRAILER AND VEHICLE
 WITH EQUIPMENT
 1455 FRANK LEADS CREW TO EGERS
 GATE. OBTAIN SAMPLES FOR SB-38
 ANALYTICALS.
 1520 DEPART PORTER OFFICE FOR
 SAMPLE MANAGEMENT.
 1600 COLLECT EQUIPMENT BLANK FOR
 PAH'S AND ARSENIC.
 1630 DEPART SITE

[Signature]
 JUN 11/15/17

Location FTMM Date 11-16-17
 Project / Client USACE
PAR 83

0730 MEET CREW DISCUSS HAS ISSUES
 WHETHER RAIN SOF.
 0830 CALIBRATE P10 0.0 AIR AND 100 ppm
 180 BUTYLUM FOR P10#22589 MINI P10 3000
 0900 HEAD TO PAR 83-SB-49 TO CONTINUE
 SOIL BORING.
 0910 BEGIN PUSHING AT SB-49
 0925 BEGIN PUSHING AT SB-37
 0935 BEGIN PUSHING AT SB-40
 0945 BEGIN PUSHING AT SB-39
 1000 BEGIN PUSHING AT SB-41
 1030 CREW RELOCATES TO SB-55
 1035 BEGIN PUSHING AT SB-55
 1050 BEGIN PUSHING AT SB-54
 1115 CREW BACKFILLS OPEN HOLES
 1130 CREW LOADS TRAILER, CLEANS
 AREA.
 1145 HEAD TO PAR 51-750J-TMW-01
 1150 BEGIN PUSHING FOR INSTALLATION OF
 TEMPORARY WELL, MEASURE DTW IN
 ADJACENT WELL 750 MW 07, DTW FROM
 GROUND LINE WAS ABOUT 9'. SCREEN
 WILL BE SET FROM 05'-10' WITH
 RISE TO GRADE. AS LOCATION OF
 11/16/17

Daily Contractor Quality Control Report

Contract Number: W912DY-09-D-0062
 Delivery Order Number: 12
 Project Name: FTMM
 Project Number: 748810
 Site Location: Oceanport and Monmouth County, NJ
 Date: 11/17/17
 Weather: High 50°F, Clear, high winds
 Field Activities Conducted: completed soil sampling @ FTMM-06, installed 2 monitoring wells
 Work Planned next work day: (Monday) complete soil borings + temp. wells @ FTMM-08
 Field Instrument Measurements (list or provide attachment): see boring logs + well construction forms
 Equipment Calibrations (list or provide attachment): see air monitoring calibration logs
 List all field and quality control samples collected (list or provide attachment): see chains of custody

Sample ID	Matrix	Collection Date & Time	Analyses	Shipment Date	Lab	Comments

- Table listing all field/QC samples collected
- Field sampling forms (in separate submittal).
- Field-generated analytical results
- Chain-of-custody forms (signed CoC will be posted to the Denver server).

Signed by: [Signature]
 Name (print): Wade Loizos
 Date: 11/17/17
 Phone Number: (732) 763-1437
 Copies sent to: Chris Coill, Julien Chambert, Corinne Weber

Location FTMM Date 11-16-17Project / Client USACEPAR 83

TMW-01 IS A 3' WELL IN ELEVATION THAN
MW-07

1215 DPM IN TMW-01 PASSING FROM

11' DEPTH

1230 BREAK FOR LUNCH

1315 CREW LOADS MATERIALS TO RELOCATE
TO FTMM-66.

1340 BEGIN ADVANCING BORING AT
FTMM-66-886-SB-01 TO 12'

1355 BEGIN PUSHING SB-02

1415 BEGIN PUSHING SB-03

1435 BEGIN PUSHING SB-04

1450 CREW BACKFILL OPEN BOREHOLE

1505 CREW CLEANS AREA AND LOADS

VEHICLE FA REPORTS 8.1' BGS TO GW AT TMW-01

1510 CREW OFFSITE FOR THE DAY

1530 MEET FRANK A. AT TMW-01

TO ASSIST WITH BACKFILLING BORING

AFTER REMOVAL OF TEMPORARY 1" PVC

WELL POINT SCREEN AND CASING

1545 RETURN TO THE OFFICE TO COMPLETE

LDC FORMS.

1605 TH off-site.

1700 NL off-site

Location FTMM Date 11-17-17Project / Client USACEFTMM-66-886 SOIL BORINGS

0730 ON SITE, WINDY, WINDY, WINDY

0745 CREW ON SITE, PART ARE IN H&S KICKOFF
DISCUSSION

0815 CREW TAKES ON WATER TO TANK

0835 HEAD TO FTMM-66-886-SB-05

0855 CREW BEGINS PUSHING AT SB-05.

0915 CREW PUSHES AT SB-04

0930 CREW PUSHES AT SB-07

1000 CREW PUSHES AT SB-08

1045 CREW LOADS EQUIPMENT TO TRUCK

1115 CREW HEADS TO STAGED MATERIALS

AREA TO TRANSFER WELL CONSTRUCTION

EQUIPMENT TO TRUCK.

1130 CREW BREAKS FOR LUNCH.

1200 CREW SETS UP AT PAR-56-800-20-MW-01

PROPOSED LOCATION AND BEGINS DRILLING VIA 4 1/4

HSA.

1210 CUTTINGS RECOVERED FROM 5' DEPTH APPEAR

TO INCLUDE AN OLIVE-GREEN BROWN SANDY SILT.

1215 THOSE FROM 3' TO 10' ARE SIMILAR,

BASED UPON INFORMATION GENERATED FROM

ADJACENT SOIL BORINGS, WE EXPECT 6' DEPTH

WATER TO BE AT A DEPTH OF 2' BGS.

1220 CUTTINGS FROM A DEPTH OF 2' ARE

Location ETMM Date 11-17-17Project / Client USACEPAR-56-800-20 MW INSTALLATION

WET AND DARK-TAN BROWN.

1225 AT 15' ADD FOURTH BAG TO
DEPT TO 18', PLAN TO SET SCREEN FROM
7-17' WITH AT LEAST 6" OF FLOOR-ROCK
BELOW THE BAGS.

1230 INSTALL RODS (25') TO PUSH OUT THE PUG,
INSTALL 10' OF 10-SLOT SCREEN AND ADD

4 BAGGONS OF WASTE INSTALL AND PUG.

10' RISER (2" DIAMETER) PVC, ADD 1

MARLE AND PUGST BAGS INSTALL 1" TRENCH

PIPE FOR INSTALLATION OF REMAINING SAND (FOR

USE AS CONTROL AGAINST RESPONSE AND

MEASUREMENT OF DEPTH).

1240 ADD THIRD BAG OF #1 MARLE, PULL
3RD AVERE.

1245 6TH BAG IS #0 MARLE SAND

MEASUREMENT UP TO 2.5' BAGS

1250 INSTALL 3/8 BENTONITE CLIPS TO 0.5' B.G.S.

1300 INSTALL PROTECTIVE CASING, AND ENROUTE

TO GRADE BEGETIVE CASING LAD IS 2.05'

ABOVE TOIC. CLEAN CRASSLY DEWETS AVERE RIGHTS.

SKETCH OF WALL CONSTRUCTION PLACED ON WALL

CONSTRUCTION FORMS

HEAD TO PAR-55-800-12-MW-01

Jhu
11-17-17

Location ETMM Date 11-17-17Project / Client USACEPAR-55-800-12-MW-01 INSTALLATION

1305 BEGIN UNCURING THROUGH ASPHALT
AT PAR-55-800-12-MW-01 PROPOSED
LOCATION.

1315 THROUGH ASPHALT BEGIN AVERING TO
21' TO SET THE 2" 10-SLOT SCREEN FROM
10-20' BAGS WITH RISER TO GRADE
AND PUGST-MOUNT BOX.

1320 CUTTINGS ARE A GRAYISH-GREEN BROWN
SANDY SILT WITH A SLIGHT ORGANIC ODOUR.

1330 AT 10' SIMILAR CUTTINGS, MOIST

1335 AT ~12' SLIGHT PEARL/MELICE OODOR
AND CHANGE IN COLOUR TO LIGHT-ORANGE-BROWN

1340 AT 15' BEGINNING TO BECOME WET.

1345 AT 21' PUSH PUG WITH RODS
INSTALL 10' SCREEN AND RISER TO GRADE,
ADD #1 MARLE SAND

1400 5TH BAG #0 SAND TO 8'-DEPTH.

1405 BENTONITE (3/8") CLIPS ADDED - 2-BAGS-
TOIC 8' B.G.S. DEPTH TO BENTONITE 2.6' BAGS.

1420 CLEAN WADS EQUIPMENT

1430 FA WADS WALKS TO ETMM-08
LOCATION WHICH WILL BE THE LOCATION
FOR PLANNED BAGGONS / TEMPORARY WALL
INSTALLATIONS ON MONDAY

Jhu
11-17-17

Location FTMM

Date 11-17-12

Project / Client USACE

[Signature]

FTMM-08

1500 PA TAXES NL AND JTE TO FTMM-08
AREA FOR REGION

1530 CHECK BOSTON AREA AND COMPLETE
FORMS

1535 CALL DIVISION CHANGES

1600 DEPART SITE

[Large handwritten signature]
11/17/12

Location _____

Date _____

Project / Client _____

Empty grid area for notes on page 37.

WELL DEVELOPMENT REPORT

CLIENT: USACE	WELL ID: PAR-56-800-20-MW-01
PROJECT NAME: <u>FTHM</u>	DATE: <u>11/21/17</u>
LOCATION: <u>Oceansport, NJ</u>	PROJECT NO.: _____

DRILLING METHOD (s): <u>ISA (w/ Geoprobe)</u>	INSPECTOR: <u>D. Loicos</u>
PUMP METHOD (s): <u>Whale</u>	CONTRACTOR: <u>ECBI</u>
SURGE METHOD (s): <u>Blade</u>	CREW: <u>W. Reeve</u>
INSTALLATION DATE: <u>11/21/17</u>	START DEVELOPMENT DATE: <u>11/20/17</u>
	END DEVELOPMENT DATE: <u>11/21/17</u>

WATER DEPTH (TOC): <u>12.39</u> ft	INSTALLED POW DEPTH(TOC): <u>20</u> ft
WELL DIA. (ID CASING): <u>2</u> ft	MEASURED POW DEPTH(TOC): <u>20</u> ft
BORING DIAMETER: <u>8</u> ft	SILT THICKNESS: <u>-</u> ft
	POW AFTER DEVELOPMENT: <u>-</u> ft

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	2	3	4	5	6	7	8	9	10	11	12
GALLONS/ FT:	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	4.08	4.93	5.87

STANDING VOLUME INSIDE WELL = WATER COLUMN X WELL DIAMETER FACTOR = _____ GAL = A

STANDING WATER IN ANNULAR SPACE =
 WATER COL. BELOW SEAL(ft) X (BORING DIAM. FACTOR - WELL DIAM. FACTOR) X 0.3 = _____ GAL = B

SINGLE STANDING WATER VOLUME = A + B = _____ GAL = C

MINIMUM VOLUME TO BE REMOVED = 5 X C = _____ GALS.

ACTIVITY	START TIME	END TIME	ELAPSED TIME	GALLONS REMOVED	pH (std)	CONDUCTIVITY ()	TEMP ()	COLOR	TURBIDITY (ntu)	OTHER
surge	0855	0855	1	-	-	-	-	-	-	
purge	0855	0910	15	~3	-	-	-	-	-	
surge	0910	0910	1	-	-	-	-	-	-	
purge	0910	0925	15	~3	-	-	-	-	-	purged DRY
surge	1150	1150	1	-	-	-	-	-	-	
purge	1150	1205	15	~5	-	-	-	-	-	purged DRY
TOTALS/FINAL			45	12						

COMMENTS: - well surged + purged dry 4 times on 11/20 (estimated ~12 gallons purged on 11/20). Water still turbid @ completion of development - purged for approximately 1 hour on 11/20

11-22-17

* FIACCORSI - ON-SITE AT PARCEL 34-2567

TO DEVELOP MW-11, WHICH WAS RECENTLY
INSTALLED, BUT NOT DEVELOPED.

DEPTH TO WATER: 2.92' FT (T.O.C.)

BEGIN PURGING @ 10:42

END PURGING 11:06

@ APPROX 1 GPM, PUMPED A TOTAL OF
APPROX. 25 GAL. SURGED WELL 2
TIMES. FLOW WAS TURBID FREE WHEN
STOPPED PUMPING.

12-13-17 - MW INSTALLATION

20's-30's, WINDY
SUNNY

0700 ON-SITE W/ ECDI, CONDUCTED HEALTH & SAFETY
MEETING IN CONF. RM, BLDG. 563, FM, W/ KEN
ATWOOD AND TOM McHALLY.

0850 MOBILIZED TO PAR-56-900-20-MW-02
LOCATION. BEGAN DRILLING (HSA ON GEOPROBE
7822) TO 18 FT. DEEP, SCREEN SET FROM 7'-17'
STEEL STICK-UP RISER. GRAVEL (MORIE #1 (5 BAGS)
PACK FROM 18' TO 6', MORIE #0 (1 BAGS) FROM 5'-6'
1010 FINISH ~~WELL~~ WELL EXCEPT FOR STICK-UP RISER
AND DEVELOPMENT, WHICH WILL BE DONE BY CREW 2
NEXT WEEK. GENERATED 1 DRUM OF SOIL
CUTTINGS. 15 MIN. BREAK

1035 MOBILIZE TO PAR-55-MW-04 LOCATION.
SUPPORT TRUCK WENT TO B. 699 STAGING AREA TO
UNLOAD DRUM, DECOR RUGERS, TAKE DELIVERY OF
NEW MW MATERIALS, UNLOAD, STAGE.

1110 BEGAN DRILLING PAR-55-800-12-MW-04 TO 21 FT.
BGS, SET SCREEN FROM 10' TO 20'. USED 5 BAGS MORIE
#1 TO 1' ABOVE SCREEN, 1 BAG MORIE 0 TO 2' ABOVE SCREEN.
1205-1245 LUNCH BREAK 1 DRUM SOIL

1250 BEGIN DRILLING PAR-55-800-12-MW-03 TO 21 FT.
SET SCREEN FROM 10' TO 20', USED 5 BAGS MORIE #1,
1 BAG MORIE #0, 1.5 BKG BENTONITE GROUT
GENERATED 1 DRUM SOIL

G.W. @ 11.8 FT PAR-55-800-12-MW-01

1510 FINISHED DRILLING MOVE RIG TO MW-02 LOCATION
CLEAN UP SITES, MOVE DRUM, MATERIALS PREP.
END OF DAY

12-18-07 MW INSTALLATION 40'S, FT. CLDY

0710 ECDL ARRIVED (K. ATWOOD, J. MONALLY, COLIN R. CARRASQUILLO). HEAD Z, LEVY ON SITE 0700. HEAD H'S MEETING. ALSO DISCUSSED ANTICIPATED WORK GOALS FOR THE DAY (COMPLETE + DEVELOP 4 WELLS). ZOHAR WENT W/ CREW 2 - MOB. TO 800-20, 800-12 TO DEV. + COMPLETE WELLS.

0800 MOB. GEORGE CREW 1 TO PAR-83-482-MW-02 TO INSTALL WELLS W/HOLLOW STEM AUGER. DRILLED TO 13 FT. SET SCREEN FROM 2' TO 12' BASED ON GW LEVEL OF 3.5 FT IN 108 MW04. USED:

5 BAGS MORIE #0, 1 BAG MORIE #00, 1/4 BAG BENTONITE.

0940 MOB TO PAR-83-482-MW-01, MUST FIRST HAMMER THRU 8 IN CONCRETE TO START. AUGERED TO 13 FT. SET SCREEN FROM 2 FT TO 12 FT. USED SAME QTY. MATERIALS AS MW-02.

1120 MOB. TO 699 TO DECON AUGERS, MOVE 1 SOIL DROM.

1200-1230 LUNCH

1230 MOB. TO PAR-29-490-MW-03, INSTALL MW W/HSA TO 13 FT. SET SCREEN FROM 2'-12'. USED:

5 BAGS MORIE #0, 1 BAG MORIE #00, 1/4 BAG BENTONITE

1400 FINISH WELL, CLEAN AUGERS, MOB TO:

1415 PAR-29-490-MW-02 LOCATION. AUGER TO 13 FT.

SET SCREEN @ 2' TO 12' USED SAME QTY. MATERIALS

AS MW-03 FINISH WELL @ 1520

MOB TO B. 699 TO DECON AUGERS

Location FTMM

Date 12/18/17

Project / Client MW Development / USACE

Weather - Cloudy, up to mid 40s

Activity - MW Development + pad construction

Equipment - 1x water level; 1x Harsco, 1x
LaPlatte, 1x PED, PPE, hand toolsPersonnel - Calvin Tighe } ECPT
Ramon Carrasquillo }

Zabur Lavy - Parsons

0700 - All on-site + H+S. meeting

0745 - ECPT loading/getting up

0835 - Begin development at MW-02
(800-20)

1035 - Complete development at MW-02 (37 gal purged)

1045 - Begin development at (800-12) MW-04

1210 - Complete MW-04 development -
37 gallons purged

1230 LVD

1315 - Cutting pad at MW-02 (800-12)

1350 - Begin development at MW-02

1512 - Complete development at MW-02
(400-12)

- ~ 33.5 gallons purged.

- Clean up

1530 - ECPT off-site

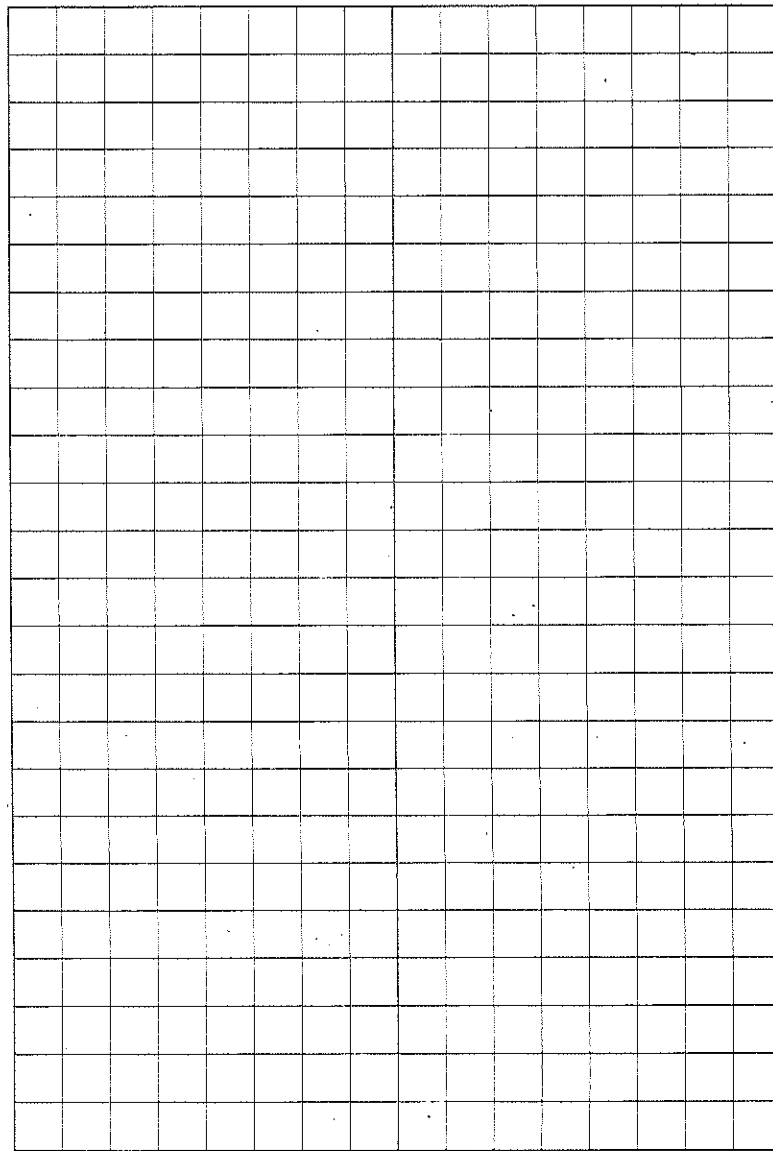
1545 - Z. Lavy off-site

ZL

Location

Date

Project / Client



WELL DEVELOPMENT REPORT

CLIENT: US Army Corps of Engineers WELL ID: PAR-56-VST 800-20-MW-02

PROJECT NAME: Ft. Monmouth, NJ (FTMM) DATE: 12/18/17

LOCATION: Parcel 56 VST 800-20 PROJECT NO.: FTMM/Parcel# 56

DRILLING METHOD (s): <u>Hollow Stem Auger</u> PUMP METHOD (s): <u>Submersible 12v. Whale Pump</u> SURGE METHOD (s): <u>Surge block</u> INSTALLATION DATE: _____	INSPECTOR: <u>Zobur Lavy</u> CONTRACTOR: <u>ELDI</u> CREW: <u>Collin Tyle, Roman Carrasquillo</u> START DEVELOPMENT DATE: <u>12/18/17</u> END DEVELOPMENT DATE: <u>12/18/17</u>
--	---

WATER DEPTH (TOC): <u>13.2</u> ft WELL DIA. (ID CASING): <u>2"</u> 2 in BORING DIAMETER: <u>8"</u> 8 in	INSTALLED POW DEPTH(TOC): _____ ft MEASURED POW DEPTH(TOC): <u>20.2</u> ft SILT THICKNESS: _____ ft POW AFTER DEVELOPMENT: _____ ft
---	--

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	2	3	4	5	6	7	8	9	10	11	12
GALLONS/FT:	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	4.08	4.93	5.87

STANDING VOLUME INSIDE WELL = WATER COLUMN X WELL DIAM. FACTOR = 2.08 x .163 = 1.15 GAL. = A

STANDING WATER IN ANNULAR SPACE =
 WATER COL. BELOW SEAL(ft) X (BORING DIAM. FACTOR - WELL DIAM. FACTOR) X 0.3 =
2.08 X (2.61 - .163) = 2.447 X 0.3 = 5.2 GAL. = B

SINGLE STANDING WATER VOLUME = A + B = 1.15 + 5.2 = 6.35 GAL. = C

MINIMUM VOLUME TO BE REMOVED = 5 X C = 5 X 6.35 = 31.75 GALS.

ACTIVITY	START TIME	END TIME	ELAPSED TIME	GALLONS REMOVED	pH (std)	CONDUCTIVITY ()	TEMP ()	COLOR	TURBIDITY (ntu)	OTHER
Development - purge	0835	0838	3 min	3	NA					Very turbid
purge	0855	0900	5 min	5.5 ± 2.5	5.55	0.095	14.65	9124/2101	error	X 2.5
purge	0925	0930	5 min	2.5	4.42	0.089	12.94	"		2.5
purge	0940	0945	5 min	10.5 ± 2.5	4.03	0.087	12.86	grey	345	914 + 2
purge	1000	1005	5 min	26	4.57	0.088	12.99	Cloudy	800	72.5 + 9
purge	1022	1025	3 min	32.5	4.10	0.085	12.81	5600/2101 cloudy	279	72.5
purge	1039	1035	2 min	37	4	0.084	13.9	"	452	
TOTALS/FINAL										

COMMENTS:

12-18-17 MW INSTALLATION 40'S, FT. CLDY

0710 ECDI ARRIVED (K. ATWOOD, T. McNALLY, COLIN R. CARUSO) HERR Z. LEVY ON SITE 0700. HELD HTS MEETING. ALSO DISCUSSED ANTICIPATED WORK GOALS FOR THE DAY (COMPLETE + DEVELOP 4 WELLS). ZOHAR WENT W/ CREW 2 - MOB. TO 800-20, 800-12 TO DEV. + COMPLETE WELLS.

0800 MOB. GEOPROBE CREW 1 TO PAR-83-482-MW-02 TO INSTALL MW'S W/ HOLLOW STEM AUGER. DRILLED TO 13 FT. SET SCREEN FROM 2' TO 12'. BASED ON GW LEVEL OF 3.5 FT IN 108 MW-04. USED:

5 BAGS MORIE #0, 1 BAG MORIE #00, 1/4 BAG BENTONITE.

0940 MOB TO PAR-83-482-MW-01, MUST FIRST HAMMER THRU @ IN CONCRETE TO START. AUGERED TO 13 FT. SET SCREEN FROM 2 FT TO 12 FT. USED SAME QTY. MATERIALS AS MW-02.

1120 MOB. TO 699 TO DECON AUGERS, MOVE 1 SOIL DRUM.

1200-1230 LUNCH

1240 MOB. TO PAR-29-490-MW-03, INSTALL MW W/ HSA TO 13 FT. SET SCREEN FROM 2'-12'. USED:

5 BAGS MORIE #0, 1 BAG MORIE #00, 1/4 BAG BENTONITE

1400 FINISH WELL, CLEAN AUGERS, MOB TO:

1415 PAR-29-490-MW-02 LOCATION, AUGER TO 13 FT. SET SCREEN @ 2' TO 12' USED SAME QTY. MATERIALS AS MW-03 FINISH WELL @ 1520 MOB TO B. 679 TO DECON AUGERS

12-19-17 MW INSTALLATION 40'S, FT. SUNNY

0700 ECDI ARRIVED (K. ATWOOD, T. McNALLY, CREW 2: COLN TIGHE, ROMAN C.) Z. LEVY ON SITE 710. HELD HTS MEETING. DISCUSSED WORK GOALS - INSTALL 3 MW'S, COMPLETE/DEVELOP 4 MW). ZOHAR MOB. W/ CREW 2 TO 884-MW 2,3.

0800 MOB TO PAR-72-211-MW-02 LOCATION, HSA TO 16 FT. SET WELL SCREEN FROM 5 FT TO 15 FT. USED 6 BAGS MORIE #0, 1 BAG MORIE #00, 1/2 BAG BENTONITE
0940 FINISH WELL MOB TO PAR-72-211-MW-03 LOCATION HSA TO 14 FT. SET SCREEN FROM 3' TO 13'. USED:

5 BAGS MORIE #0, 1 BAG MORIE #00, 1/4 BAG BENTONITE

1030 CLEAN AUGERS, MOB TO PAR-72-211-MW-04

1100 HSA TO 215 FT. DISCOVERED STORM SEWER PIPE THAT AUGERS WERE ALONG SIDE OF. MOVED MW LOCATION 6 FT. TO NORTH TO AVOID STORM SEWER PIPE AND ELECTRIC WIRES FROM LIGHT POLES.

1115 HSA TO 14 FT. SET SCREEN FROM 3' TO 13' 5 BAGS MORIE #0, 1 BAG MORIE #00, 1/4 BAG BENTONITE

1240 WELL FINISHED, LUNCH BREAK, DECON AUGERS

1330 MOB TO M5 MW 19 ^{18 FT. DEEP} LOCATION W/ GEOPROBE TO PULL STEEL STICK UP CASING, + CONCRETE

MOB TO M5 MW 19 (18 FT. DEEP) PULLED OUTER STEEL STICK-UP ROSSER CASING W/ GEOPROBE, LOOSENED PVC WELL CASING, WILL RETURN TOMORROW TO GROUT WELLS

1500 ECDI DEPART

Location FTMM Date 12/18/17
 Project / Client MW Development / USACE

Weather = Cloudy, up to mid 40s
 Activity - MW Development + pad construction
 Equipment = 1x water level; 1x Horiba; 1x
 Calotta; 1x PED; 9PE; hand tools
 Personnel - Calvin Tighe > ECOT
 Ramon Carrasquilla
 Zohar Levy - Parsons

0700 - All on-site + H&S meeting
 0745 - ECOT loading/getting up
 0835 - Begin development at MW-02
 (800-20)
 1035 - Complete development at MW-02 (37 gal purged)
 1045 - Begin development at (800-12) MW-04
 1210 - Complete MW-04 development -
 37 gallons purged
 1230 lunch
 1315 - Cutting pad at MW-02 (800-12)
 1350 - Begin development at MW-02
 1512 - Complete development at MW-02
 (400-12)
 - ~ 33.5 gallons purged.
 - Clean up
 1530 - ECOT off-site
 1545 - Z. Levy off-site
 / ZL

Location FTMM Date 12/19/17
 Project / Client MW Development / USACE

Weather - P. cloudy, up to mid 50s
 Activity - MW Development + pad construction
 Equipment = 1x water level; 1x Horiba; 1x Calotta;
 1x PED; 9PE; hand tools
 Personnel - Calvin Tighe > ECOT
 Ramon Carrasquilla
 Zohar Levy - Parsons

0715 - Z. Levy on-site + H&S meeting
 0735 - Set up on MW-03 (800-12)
 0745 - Begin development at MW-03
 0825 - Complete development at 800-12-
 MW-03 30 gall. purged.
 0940 - Begin development of 884-MW-03
 1015 - Complete development of 884-MW-03
 - purged @ 35 gallons
 1020 - Begin development of 884-MW-02
 1055 - Complete development of 884-MW-02
 - purged 35 gallons.
 1100 - Lunch
 1200 - Loading truck
 1215 - Setting up at 444-MW-2 + setting pad
 1245 - Begin development at 444-MW-2
 1335 - Complete development at 444-MW-2
 - purged 35 gallons
 1345 - Begin purge/low @ 444-MW-1

Location

FTMM

Date

12/19/17

Project / Client

Mw Development / USAEC

- 1456 - Complete development of
- 444 - Mw - 01
- Purged 30 gallons
- 1500 - Clean up.
- 1515 - ECPI off-site
- 1530 - 2. Lavy off-site.

24

Location

Date

Project / Client