



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:

- "IRP Site FTMM-66 (Building 886 Area), Supplement to Summary Remedial Investigation Report, Request for Unrestricted Use, No Further Action Approval, Fort Monmouth, Monmouth County, Oceanport, New Jersey" (20 March 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: _____

Date: 20 March 2018

Name/Title: William R. Colvin, PMP, CHMM, PG
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



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

20 March 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: IRP Site FTMM-66 (Building 886 Area)
Supplement to Summary Remedial Investigation Report
Request for Unrestricted Use, No Further Action Approval
Fort Monmouth, Monmouth County, Oceanport, New Jersey
PI G000000032

Dear Mr. Joshi:

The Fort Monmouth (FTMM) Team has prepared this supplement to the Summary Remedial Investigation (RI) Report previously submitted to the Department (Reference 1 provided in **Attachment A**). This supplement describes the recent investigation at the subject site and includes a request for an Unrestricted Use, No Further Action (NFA) determination for FTMM-66.

FTMM-66 Background

FTMM-66 was initially associated with Building 886. A 1,000-gallon fuel oil underground storage tank (UST) removed in 1998 and a 250,000-gallon fuel oil above-ground storage tank (AST) removed in the 1970's were identified as contributing sources of soil and groundwater contamination. In 2002 and 2003, approximately 4,000 tons of petroleum-contaminated soil were excavated and removed. The presence of high-voltage electric lines limited the westward extent of the soil excavation; thus, a Light Non-Aqueous Phase Liquid (LNAPL) recovery system was installed in 2003 near these subsurface electric lines.

The Army's 6 April 2017 request for a no further action determination (Reference 1 of **Attachment A**) was based on multiple lines of evidence including compliance averaging, which demonstrated that site soils complied with the NJDEP residential direct contact soil remediation standard (RDSCRS) of 5,100 mg/kg.

NJDEP stated (17 April 2017 email, Reference 4 provided in **Attachment A**) that the submittal could not be evaluated because petroleum hydrocarbons were present above the residual product/free product limit of 8,000 mg/kg. Because the soil data were generated in 2003 and earlier, a Letter Work Plan (Reference 2 provided in **Attachment A**) was prepared to obtain confirmation soil samples for extractable petroleum hydrocarbons (EPH) analysis at locations that previously were found to exceed the 8,000 mg/kg limit. NJDEP approved the Letter Work Plan on 2 November 2017 (Reference 3 provided in **Attachment A**).

2017 Investigation Results

In November 2017, eight soil borings were completed to 12 feet (ft) below ground surface (bgs) and soil samples were collected at the locations of borings 886-PX14A, 886-PX15A, 886-PX19, 886-PX24, 886-PX26, 886-PX30, 886-41, and 886-57 installed in 2003. The 2003 sample locations are shown on **Figure 2**. Two soil samples were collected from each of the borings:

- One sample from the same depth interval as the previous sample with elevated TPH concentrations; and
- One sample from the most contaminated interval encountered in the boring based on field evidence (visual, olfactory, and photoionization detector ([PID])). If there was no evidence of petroleum hydrocarbon presence, then this sample was collected from just above the water table (approximately 8 ft bgs).

Field notes and soil boring logs are provided in **Attachment B** and **Attachment C**. The samples were analyzed for EPH by ALS Environmental (ALS). Three samples in which EPH was detected at concentrations greater than 8,000 mg/kg were also analyzed for naphthalene and 2-methylnaphthalene. The soil sample locations and results are shown on **Figure 3**.

EPH was detected at concentrations greater than the free/residual product limit of 8,000 mg/kg at four locations (**Table 1** and **Figure 3**):

- FTMM-66-886-SB-03-6.5-7: 9,620 mg/kg
- FTMM-66-886-SB-05-7.5-8: 11,500 mg/kg
- FTMM-66-886-SB-06-5-5.5: 10,200 mg/kg
- FTMM-66-886-SB-07-7-7.5: 9,350 mg/kg

EPH was detected at a concentration greater than the RDCSRS of 5,100 mg/kg at only one additional location: FTMM-66-886-SB-01-7.5-8 (5,640 mg/kg).

As shown in **Table 2**, the 2017 results show a significant decrease in petroleum hydrocarbon concentrations in comparison to the 2003 results. Furthermore, petroleum constituents in groundwater have also decreased over this time period, as demonstrated by the approval of NFA for FTMM-66 groundwater (Reference 5 provided in **Attachment A**). It is our understanding that the principal concern for NJDEP's soil cleanup standards at this site are for the protection of groundwater. The data indicates that the petroleum hydrocarbons concentrations in soil have been significantly biodegraded and will continue to attenuate over time.

Naphthalene and 2-methylnaphthalene were detected at concentrations less than the RDCSRS and non-residential direct contact soil remediation standards (NRDCSRS) (**Table 1**). Naphthalene was detected at concentrations less than the NJDEP Impact to Ground Water (IGW) Soil Screening Levels (SSLs). Two samples, FTMM-66-886-SB-03-6.5-7 and FTMM-66-886-SB-05-7.5-8 had 2-methylnaphthalene concentrations (45.7 and 52.7 mg/kg) greater than the IGW SSLs (8 mg/kg). However, based on previous groundwater monitoring results from 2003 through 2011 and from 2013

through 2015, 2-methylnaphthalene is not a contaminant of concern (COC) in groundwater (Reference 5 provided in **Attachment A**).

As described in the Summary RI Report (Reference 1 of **Attachment A**), the 95% upper confidence limit (UCL) method for compliance averaging was performed for FTMM-66 soil using the earlier 2003 soil data. The results of the compliance averaging indicated that soil at FTMM-66 meets the NJDEP RDCSRS of 5,100 mg/kg for EPH. The results of recent sampling further demonstrate a reduction in soil hydrocarbon concentrations since 2003, which supports the compliance with the NJDEP RDCSRS in site soils.

NJDEP policy requires EPH concentrations to be less than the 8,000 mg/kg NJDEP residual or free product limit. A free product removal system was installed and operated from 2003 to 2004, and no LNAPL was observed through 2007, as presented in the approved July 2010 *Remedial Action Progress Report* (Attachments B and E of Reference 1). In addition, groundwater monitoring from 2003 through 2015 has demonstrated that petroleum constituents in groundwater are below the NJDEP Ground Water Quality Standards. Therefore the exceedance of the residual or free product limit at this site does not pose a risk to groundwater and does not warrant additional action.

Conclusions

The government has performed extensive remediation work at FTMM-66. Historical free product recovery has demonstrated lack of recoverable product at FTMM-66 (Reference 1 provided in **Attachment A**). Groundwater monitoring analytical data support the NFA for groundwater which was approved by NJDEP on 14 November 2016 (Reference 5 in **Attachment A**). Compliance averaging indicates that soil at FTMM-66 meets the NJDEP RDCSRS (Reference 1 provided in **Attachment A**) and recent data presented in this supplement show that soil EPH concentrations have significantly attenuated.

Based on the above information an Unrestricted Use, No Further Action Approval is requested for FTMM-66 (both soil and groundwater).

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, PMP, CHMM, PG
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)

Figures:

Figure 1 FTMM-66 Location
Figure 2 FTMM-66 Site Layout and Sample Locations
Figure 3 FTMM-66 2017 Soil Sampling Locations and Results

Tables:

Table 1 –2017 Detected Soil Sampling Results – Comparison to NJDEP Soil Remediation Standards
Table 2 – Comparison of 2017 EPH Concentrations to Previous TPH Concentrations

Attachments:

- A. Previous Reports and Correspondence
- B. Field Notes
- C. Soil Boring Logs

References:

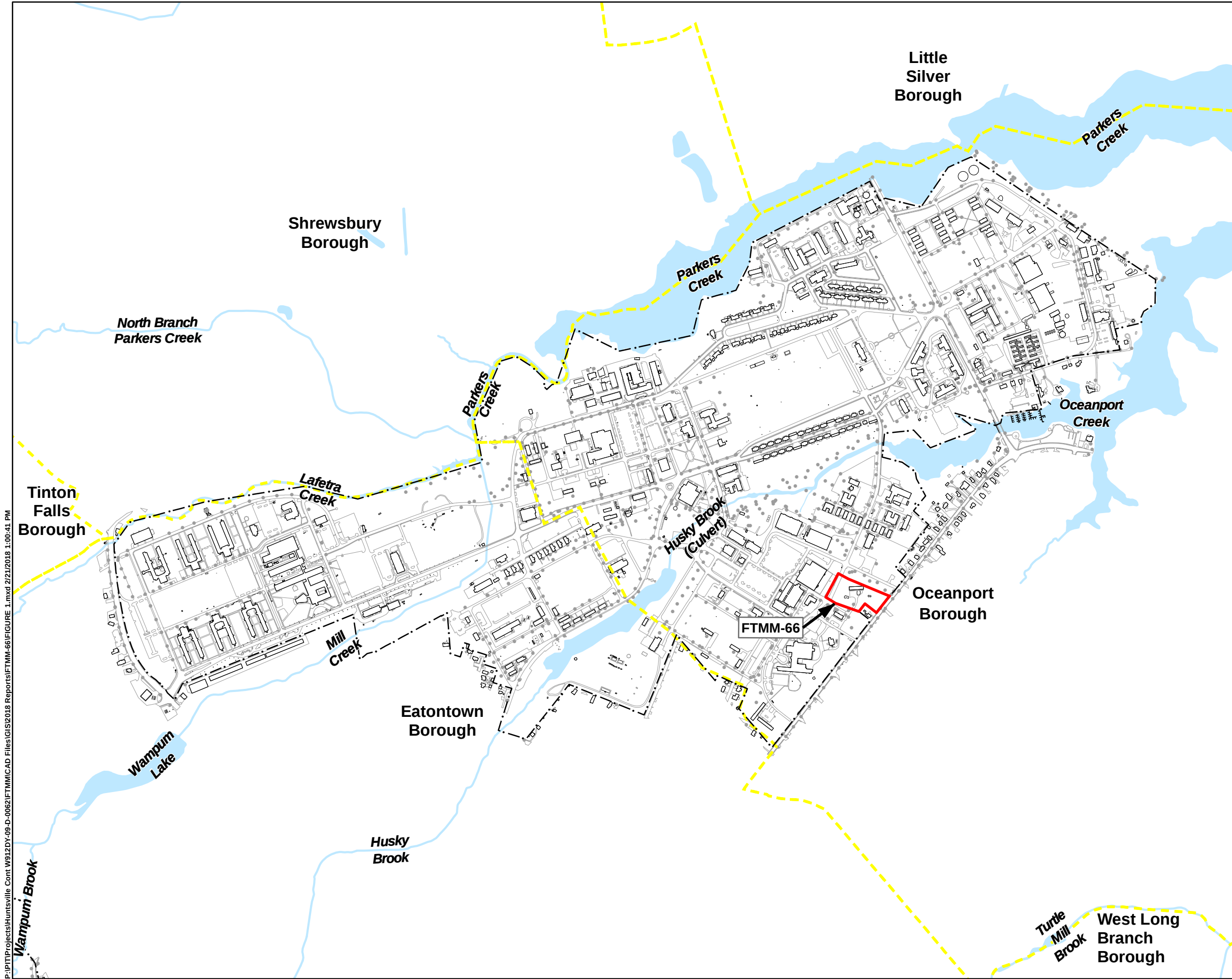
1. Parsons, 2017a. Summary Remedial Investigation Report and NFA Request for FTMM-66 Building 886 Former Aboveground Storage Tank, Fort Monmouth, NJ. April 6, 2017.
2. Parsons, 2017b. Letter Work Plan for FTMM-66, Building 886 Former Aboveground Storage Tank, Fort Monmouth, New Jersey, PI G000000032. August 15.
3. NJDEP, 2017a. NJDEP letter to the Army dated November 2, 2017, re: Work Plan for FTMM-66 Building 886 Former Aboveground Storage Tank, Fort Monmouth, Oceanport, Monmouth County, Preferred ID: G000000032.
4. NJDEP, 2017b. NJDEP email to the Army dated April 25, 2107, re: M-66 – Summary Remedial Investigation Report & Request for No Further Action for Site FTMM-66.
5. NJDEP, 2016. NJDEP letter to the Army dated November 14, 2016, re: Annual (Fourth Quarter) 2015 Groundwater Sampling Report dated September 2016, Fort Monmouth, Oceanport, Monmouth County, PI G000000032.

FIGURES

Figure 1 FTMM-66 Location

Figure 2 FTMM-66 Site Layout and Sample Locations

Figure 3 FTMM-66 2017 Soil Sampling Locations and Results

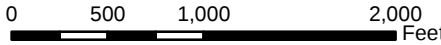


LEGEND:

- FTMM-66 Carve-Out Boundary
- Installation Boundary
- Municipal Boundary



1 inch = 1,000 feet



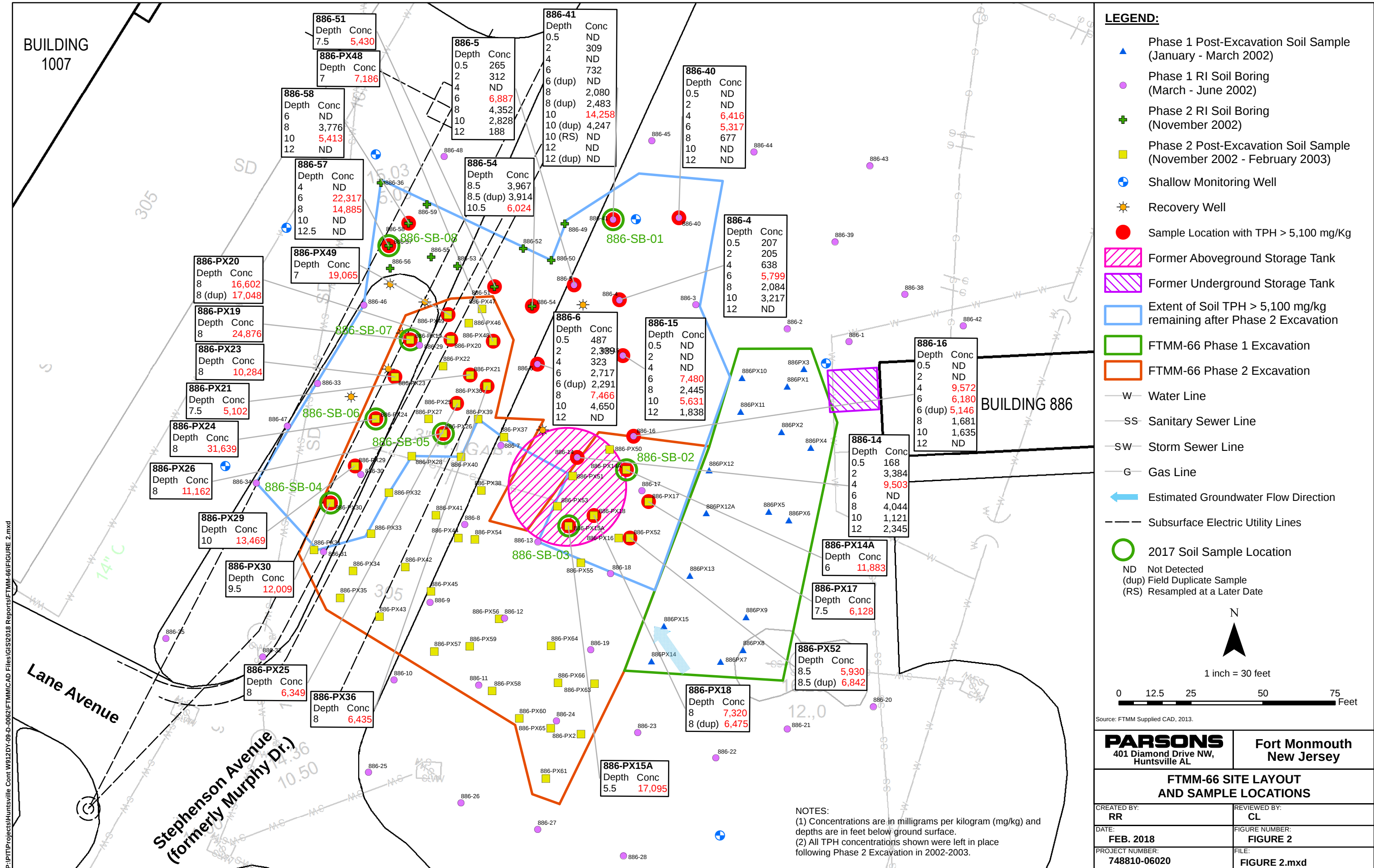
Source: FTMM Supplied CAD, 2013; ESRI Data and Maps, 2011; USGS NHD, 2012.

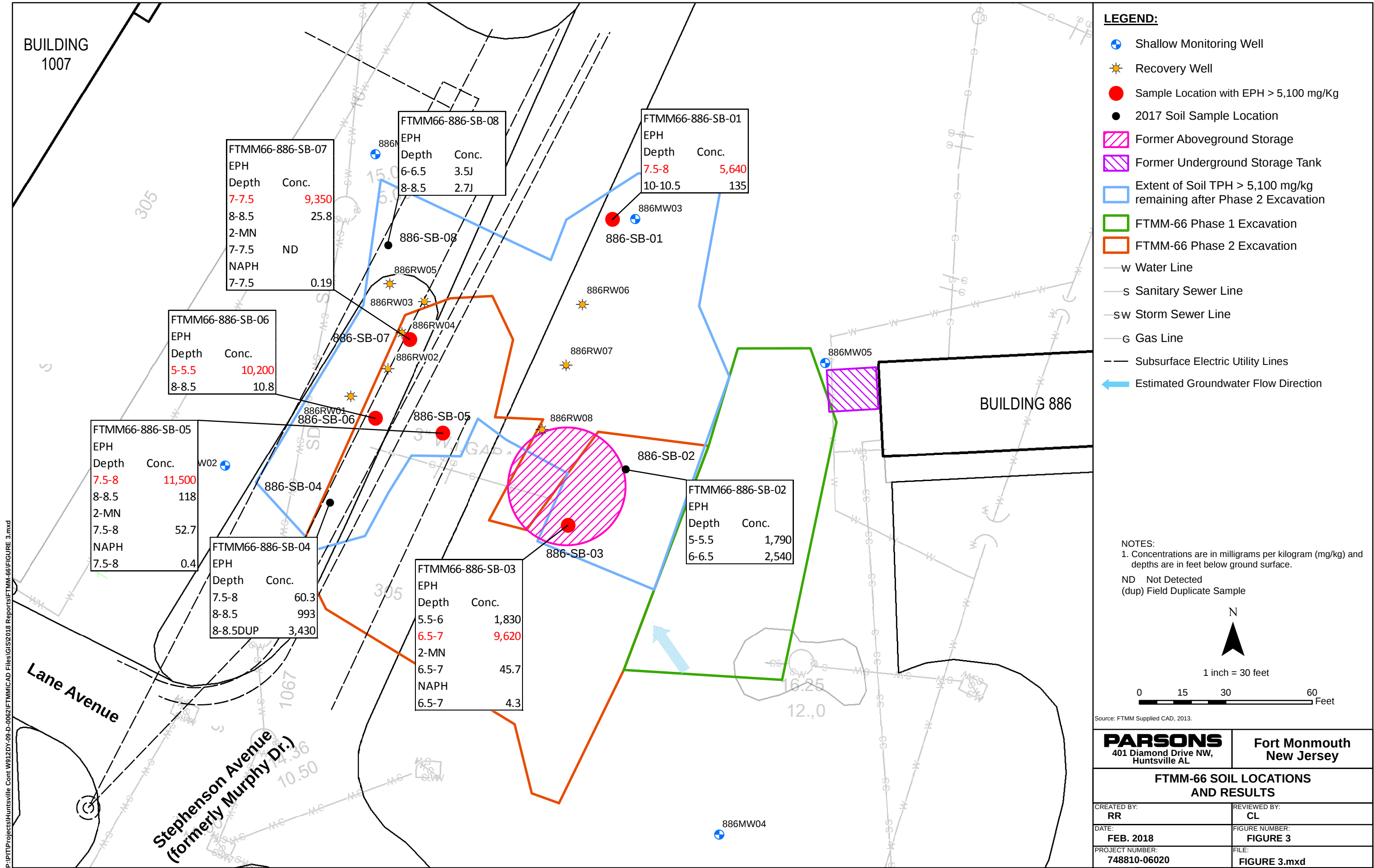
PARSONS
401 Diamond Drive NW,
Huntsville AL

Fort Monmouth
New Jersey

FTMM-66 LOCATION

CREATED BY: RR	REVIEWED BY: KF
DATE: FEB. 2018	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-06012	FILE: FIGURE 1.mxd





TABLES

Table 1 – 2017 Detected Soil Sampling Results – Comparison to NJDEP Soil Remediation Standards

Table 2 – Comparison of 2017 EPH Concentrations to Previous TPH Concentrations

TABLE 1
2017 Detected Soil Sampling Results – Comparison to NJDEP Soil Remediation Standards
SITE FTMM66 Bldg. 886
FORT MONMOUTH, NEW JERSEY

Loc ID	Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	FTMM66-886-SB-01		FTMM66-886-SB-02	
Sample ID	Sample ID				FTMM-66-886-SB-01-7-5-8	FTMM-66-886-SB-01-10-10.5	FTMM-66-886-SB-02-5-5.5	FTMM-66-886-SB-02-6-6.5
Sample Date	Sample Date				11/16/2017	11/16/2017	11/16/2017	11/16/2017
Semivolatile Organic Compounds (mg/kg)								
2-Methylnaphthalene	MG/KG	230	2,400	8				
Naphthalene	MG/KG	6	17	25				
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)								
EPH (C9-C40)	MG/KG	5,100	54,000	NLE	5,640	135	1,790	2,540

Footnotes:

1) NLE = no limit established.

2) Bold chemical detection

3) 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.
J = estimated detected value due to a concentration below the reporting limit or due to discrepancies in meeting certain analyte-specific quality control.
U = non-detect, i.e. not detected at or above this value.

4) 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 Residential Direct Contact Soil Remediation Standard.
- Cell Shade values represent a result that is above the NJ Non-Residential Direct Contact Soil Remediation Standard.
- Cell Shade values represent a result that is above the NJ Impact to GW Soil Screening Level
- Cell Shade values represent a result that is above both the NJ Residential, Non-Residential, AND NJ Impact to GW Soil Screening Level Direct Contact Soil Remediation Standard.
- Cell Shade values represent a result that is above both the NJ Residential and Non-Residential Direct Contact Soil Remediation Standard.

5) Criteria action level source document and web address.

- The NJ Residential Direct Contact Soil Remediation Standard refers to the NJDEP's Sept 18, 2017 Remediation Standards
http://www.nj.gov/deprules/rules/njac7_26d.pdf
- The NJ Non-Residential Direct Contact Soil Remediation Standard refers to the NJDEP's Sept 18, 2017 Remediation Standards
http://www.nj.gov/deprules/rules/njac7_26d.pdf
- The NJ Impact to GW Soil Screening Level criteria refers to the Development of Site Specific Impact to Ground Water Soil Remediation Standards - Nov 2013 revised
http://www.nj.gov/deprules/guidance/rs/partition_equation.pdf



TABLE 1
2017 Detected Soil Sampling Results – Comparison to NJDEP Soil Remediation Standards
SITE FTMM66 Bldg. 886
FORT MONMOUTH, NEW JERSEY

Loc ID	Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	FTMM66-886-SB-03		FTMM66-886-SB-04		
Sample ID	Sample ID				FTMM-66-886-SB-03-5-5-6	FTMM-66-886-SB-03-6-5-7	FTMM-66-886-SB-04-7-5-8	FTMM-66-886-SB-04-8-8-5	FTMM-66-886-SB-104-8-8-5
Sample Date	Sample Date				11/16/2017	11/16/2017	11/17/2017	11/17/2017	11/17/2017
Semivolatile Organic Compounds (mg/kg)									
2-Methylnaphthalene	MG/KG	230	2,400	8		45.7			
Naphthalene	MG/KG	6	17	25		4.3			
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)									
EPH (C9-C40)	MG/KG	5,100	54,000	NLE	1,830	9,620	60.3	993	3,430

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2017 Detected Soil Sampling Results – Comparison to NJDEP Soil Remediation Standards
SITE FTMM66 Bldg. 886
FORT MONMOUTH, NEW JERSEY

Loc ID		NJ Residential Direct Contact SRS	NJ Non- Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	FTMM66-886-SB-05		FTMM66-886-SB-06		FTMM66-886-SB-07	
Sample ID	Loc ID				Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID
Sample Date	Sample ID				Sample Date	Sample Date	Sample Date	Sample Date	Sample Date	Sample Date
Semivolatile Organic Compounds (mg/kg)										
2-Methylnaphthalene	MG/KG	230	2,400	8	52.7				0.076 U	
Naphthalene	MG/KG	6	17	25	0.4				0.19	
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)										
EPH (C9-C40)	MG/KG	5,100	54,000	NLE	11,500	118	10,200	10.8	9,350	25.8

Footnotes:
1) NLE = no limit established.
2) Bold chemical detection
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TABLE 1
2017 Detected Soil Sampling Results – Comparison to NJDEP Soil Remediation Standards
SITE FTMM66 Bldg. 886
FORT MONMOUTH, NEW JERSEY

Loc ID	Loc ID	NJ Residential Direct Contact SRS	NJ Non- Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	FTMM66-886-SB-08	
Sample ID	Sample ID				FTMM-66-886-SB-08-6-6.5	FTMM-66-886-SB-08-8-8.5
Sample Date	Sample Date				11/17/2017	11/17/2017
Semivolatile Organic Compounds (mg/kg)						
2-Methylnaphthalene	MG/KG	230	2,400	8		
Naphthalene	MG/KG	6	17	25		
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)						
EPH (C9-C40)	MG/KG	5,100	54,000	NLE	3.5 J	2.7 J

Table 2
Comparison of 2017 EPH Concentrations to Previous TPH Concentrations
FTMM-66
Fort Monmouth, New Jersey

2002 Sample ID	2003 TPH Concentration (mg/kg)	2017 Sample ID	2017 EPH Concentration (mg/kg)
886-41 8'	2,081	FTMM-66-886-SB-01-7.5-8	5,640
886-41 10'	14,258	FTMM-66-886-SB-01-10-10.5	135
886-PX14A/NW 5.5-6'	11,884	FTMM-66-886-SB-02-5-5.5	1,790
		FTMM-66-886-SB-02-6-6.5	2,540
886-PX15A/WW 5-5.5'	17,096	FTMM-66-886-SB-03-5.5-6	1,830
		FTMM-66-886-SB-03-6.5-7	9,620
886-PX26 E 7.5-8'	11,162	FTMM-66-886-SB-04-7.5-8	60.3
		FTMM-66-886-SB-04-8-8.5	993
		FTMM-66-886-SB-104-8-8.5	3,530
886-PX30 9-9.5'	12,009	FTMM-66-886-SB-05-7.5-8	11,500
		FTMM-66-886-SB-05-8-8.5	118
886-PX24W 7.5-8'	31,639	FTMM-66-886-SB-06-5-5.5	10,200
		FTMM-66-886-SB-06-8-8.5	10.8
886-PX19-WW 7.5-8'	24,877	FTMM-66-886-SB-07-7-7.5	9,350
		FTMM-66-886-SB-07-8-8.5	25.8
886-57-6'	22,317	FTMM-66-886-SB-08-6-6.5	3.5J
886-57-8'	14,885	FTMM-66-886-SB-08-8-8.5	2.7J

Concentration greater than the RDCSRS of 5,100 mg/kg

Concentration greater than the RDCSRS of 5,100 mg/kg and residual product/free product limit of 8,000 mg/kg

Attachment A

Previous Reports and Correspondence

1. Parsons, 2017a. Summary Remedial Investigation Report and NFA Request for FTMM-66 Building 886 Former Aboveground Storage Tank, Fort Monmouth, NJ. April 6, 2017.
2. Parsons, 2017b. Letter Work Plan for FTMM-66, Building 886 Former Aboveground Storage Tank, Fort Monmouth, New Jersey, PI G000000032. August 15.
3. NJDEP, 2017a. NJDEP letter to the Army dated November 2, 2017, re: Work Plan for FTMM-66 Building 886 Former Aboveground Storage Tank, Fort Monmouth, Oceanport, Monmouth County, Preferred ID: G000000032.
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New Jersey Department of Environmental Protection
Site Remediation Program

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

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Document: "Summary Remedial Investigation Report and NFA Request for FTMM-66 Building 886 Former Aboveground Storage Tank"

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: BRAC Environmental Coordinator

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:  Date: 04/06/2017

Name/Title: William R. Colvin / BRAC Environmental Coordinator



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

6 April 2017

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: Summary Remedial Investigation Report and NFA Request for FTMM-66
Building 886 Former Aboveground Storage Tank
Fort Monmouth, NJ
PI G000000032**

Attachments:

- A. Table 1: Summary of Compliance Averaging Results
- B. Previous FTMM-66 Correspondence (see list below)
- C. Figures
 - 1. Layout of FTMM-66 (Fuel Oil Tanks at Building 886)
 - 2. Extent of TPH > 5,100 mg/kg Remaining in Soil Following Phase 2 Excavation
- D. Soil Data - Comparison to NJDEP Criteria
- E. Previous Reports (see list below)
- F. Compliance Averaging Methodology Applied at FTMM-66

Previous Correspondence (provided in Attachment B):

- 1. NJDEP letter to the Army dated August 27, 2010, re: *Remedial Action Report, Building 886 Site – Main Post, Fort Monmouth NJ*
- 2. NJDEP letter to the Army dated March 18, 2011, re: *2010 Remedial Action Progress Reports, Fort Monmouth, NJ*
- 3. Army letter to the NJDEP dated November 26, 2014, re: *State of New Jersey Department of Environmental Protection Comments on the Final Baseline Groundwater Sampling Report (August 2013), Fort Monmouth, Oceanport, Monmouth County.*
- 4. NJDEP letter to the Army dated February 5, 2015, re: *November 26, 2014 Response to Comments on the Final Baseline Ground Water Sampling Report (August 2013), Fort Monmouth, Monmouth County.*
- 5. NJDEP letter to the Army dated November 14, 2016, re: *Annual (Fourth Quarter) 2015 Groundwater Sampling Report dated September 2016, Fort Monmouth, Oceanport, Monmouth County.*

Previous Reports (provided in Attachment E):

1. *Remedial Action Report for Soil and Groundwater Contamination, Building 886*, Versar, January 2006
2. *Site 886 (FTMM-66) Remedial Action Progress Report (2nd Quarter 2003 through 4th Quarter 2008)*, VEETech, P.C. July 2010
3. *Final Annual (Fourth Quarter) 2015 Groundwater Sampling Report, Fort Monmouth, Oceanport, Monmouth County, New Jersey*, Parsons, September 2016 (Appendix K)

Dear Ms. Range:

The U.S. Army Fort Monmouth (FTMM) has prepared this Summary Remedial Investigation (RI) Report to present information concerning environmental investigations for the Installation Restoration Program (IRP) Site FTMM-66 Building 886 Former Aboveground Storage Tank. Soil contamination at this site was remediated in 2003 to the then-current Total Petroleum Hydrocarbons (TPH) cleanup criteria of 10,000 milligrams per kilogram (mg/kg). **Correspondence 1 of Attachment B** from the New Jersey Department of Environmental Protection (NJDEP) concerning the Remedial Action Report (RAR; Versar, 2006; see **Report 1 of Attachment E**) indicated in 2010 that soil contamination should address the updated residential health-based screening criteria of 5,100 mg/kg. Long-term groundwater monitoring at FTMM-66 was discontinued in 2016 based on the recommendations of the Annual (Fourth Quarter) 2015 Groundwater Sampling Report (Parsons, 2016; **Report 3 of Attachment E**), which was accepted by NJDEP (2016; **Correspondence 5 of Attachment B**). This Summary RI Report provides an overview of site information, and the results of compliance averaging used for comparing site soil concentrations with the current residential remedial goal for extractable petroleum hydrocarbons (EPH).

1.0 SITE DESCRIPTION

FTMM-66 was initially associated with Building 886 (**Figure 1 of Attachment C**) which was previously used for equipment storage. There are currently no new development activities occurring at this site. Building 886 at FTMM-66 is surrounded primarily by grass-covered lawn areas with scattered trees. The ground surface topography is generally flat, with ground surface elevations ranging from approximately 13 to 15 feet above mean sea level. The former Commissary (Building 1007) is located just west of FTMM-66. The anticipated future land use at FTMM-66 is non-residential (i.e., commercial/industrial) (EDAW, Inc., 2008).

Contaminant sources at FTMM-66 included a former 250,000-gallon aboveground storage tank (AST) used for storing Number 2 (No. 2) fuel oil as well as a former 1,000-gallon No. 2 fuel oil underground storage tank (UST). These are Category 1 (i.e., No. 2 fuel oil and/or diesel fuel) discharges per NJDEP guidance (NJDEP, 2010a). Contamination was discovered during removal of the fuel oil UST in 1998; however, subsequent findings suggested that the AST (which was removed in the 1970's) was a contributing source of soil and groundwater contamination at FTMM-66.

In 2002 and 2003, multiple phases of Geoprobe® soil investigations (Phase I and Phase II remedial investigations), TPH-contaminated soil excavations, and post-excavation sampling occurred. Soil

samples were analyzed for TPH and for volatile organic compounds (**Attachment D**). The remedial action objective for the 2003 soil excavation project was to remove soil with TPH concentrations exceeding 10,000 mg/kg, the NJDEP cleanup goal at that time. The excavations were advanced to depths of 7 to 13 feet below ground surface (bgs), and approximately 4,000 tons of petroleum-contaminated soil were removed. Soil TPH was typically encountered in the vicinity of the water table (6 to 11 feet bgs [Versar, 2006]), suggesting historical migration as a light non-aqueous phase liquid (LNAPL). The northwesterly extent of the excavation was limited by the presence of subsurface high-voltage electric lines northwest of Murphy Drive (see **Figure 1** of **Attachment C**); therefore, not all of the elevated TPH concentrations could be removed due to these subsurface obstructions. An LNAPL recovery system was installed in 2003 in the vicinity of these subsurface electric lines as discussed in Section 3.0 below.

Subsequent to the 2003 excavation activities, the NJDEP residential remedial goal for EPH of 5,100 mg/kg and the non-residential remedial goal of 54,000 mg/kg replaced the TPH standard of 10,000 mg/kg, following NJDEP's conclusion that EPH and TPH results were comparable at a ratio of 1:1 (NJDEP, 2010b). None of the remaining TPH concentrations exceed the current non-residential remedial goal of 54,000 mg/kg. However, the TPH concentrations exceed the current residential remedial goal of 5,100 mg/kg in the northwest section of the excavation, and about 30 to 75 ft north of the excavation (**Figure 2** of **Attachment C**). TPH remaining in place was delineated with soil analyses from both Geoprobe® soil borings and from post-excavation soil samples, as presented in **Attachment D**.

NJDEP (2010b) also determined that EPH/TPH concentrations should not exceed a residual or free product limit of 8,000 mg/kg. This concentration limit is based on the residual saturation of petroleum in soil (described in Appendix 2 of NJDEP, 2010b), with the premise that LNAPL in soils at this concentration may result in the accumulation of fuel oil on the water table. Several soil sample results exceeded this residual or free product limit of 8,000 mg/kg, and an LNAPL recovery system was installed as described in Section 3.0 below.

Additional information concerning the FTMM-66 background and environmental setting is provided in the various reports in **Attachment E**.

2.0 GEOLOGY AND HYDROGEOLOGY

Well construction logs for FTMM-66 presented in Appendix A of the *Remedial Action Report for Soil and Groundwater Contamination, Building 886* (Versar, 2006; see **Report 1** of **Attachment E**) indicate that soil to a depth of 17 feet bgs is comprised of brown, fine to coarse sand with a minor fraction of silt and trace clay. Depth to groundwater was about 6 ft bgs. The shallow groundwater flow direction was generally to the north-northwest (Parsons, 2016; see **Report 3** of **Attachment E**).

3.0 FREE PRODUCT RECOVERY

An LNAPL recovery system was installed in 2003 and operated through March 2004. As reported in the Remedial Action Progress Report for 2003 to 2008 (**Report 2** of **Attachment E**), LNAPL recovery was minimal (only about 2 pints) due to site conditions and the system was shut down in

March 2004. LNAPL was consistently observed in only one recovery well (886RW04) and the last observation of LNAPL was 0.03 inch at 886RW04 in April 2005. Subsequent observations noted no LNAPL through August 2007. The 2003 to 2008 RAPR was approved by NJDEP in 2011 (see **Correspondence 2 of Attachment B**).

4.0 GROUNDWATER QUALITY

FTMM-66 monitoring wells were sampled quarterly from February 2003 through April 2011 for multiple analytes including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), TPH, and metals. Groundwater sampling was resumed in August 2013 to re-establish baseline site groundwater conditions following temporary suspension of groundwater sampling in late 2011 associated with FTMM closure. Thirteen monitoring wells were sampled in 2013 and analyzed for VOCs, SVOCs and lead. Following the NJDEP agreement with the Army (**Correspondences 3 and 4 of Attachment B**) to reduce the analyses and number of wells sampled, three wells (886RW01, 886RW06 and 886RW08) were sampled for SVOCs during the 2014 and 2015 annual sampling events.

Historical exceedances of the NJDEP groundwater quality standards (GWQS) included benzene, bis(2-ethylhexyl)phthalate, total VOC and SVOC tentatively identified compounds (TICs), and multiple metals (see **Report 3 of Attachment E**). Metals and bis(2-ethylhexyl)phthalate were not identified as potential contaminants of concern. Benzene, VOC TICs, and SVOC TICs concentrations in the historical (2011 and before) monitoring exceeded the GWQC in well 886RW01 only, and were last detected above the GWQC in 2009. SVOC TICs were detected at concentrations greater than the GWQS in two wells (886RW01 and 886RW08) in 2013, but during the 2014 and 2015 sampling events, were non-detect or below the NJDEP GWQS. Long-term groundwater monitoring was discontinued as recommended by the Army (Parsons, 2016; see **Report 3 of Attachment E**) and accepted by NJDEP (2016; see **Correspondence 5 of Attachment B**). An NFA determination is warranted for groundwater at FTMM-66.

5.0 COMPLIANCE AVERAGING FOR SOIL

The 95% upper confidence limit (UCL) method for compliance averaging was applied at FTMM-66 using an approach consistent with the attainment guidance (NJDEP, 2012) to determine whether the current residential remedial goal for EPH has been achieved. The previous TPH results were considered comparable to EPH results for decision making purposes based on NJDEP guidance (2010a and 2010b).

NJDEP requires EPH concentrations to be less than the 8,000 mg/kg residual or free product limit (Step 7 of NJDEP, 2010a). Soil TPH concentrations in 2003 were measured in excess of this criteria at multiple locations at FTMM-66; however, these sample data are over 14 years old. Because the source of contamination was removed by 2003 and is no longer contributing to the onsite release, it is likely that TPH concentrations have significantly decreased by natural degradation processes since the remediation occurred. Further, a free product removal system was installed at the site (see Section 3.0). Also, subsequent post-excavation groundwater monitoring has demonstrated the reduction of petroleum constituents in groundwater over time (see Section 4.0). Therefore, the site meets the intent of the NJDEP policy criteria for EPH, and compliance averaging was performed using historical (2003) soil sample results.

The compliance averaging methodology and supporting documentation are provided in **Attachment F**. The results are summarized in **Table 1** in **Attachment B**. The average TPH concentration for each functional area met the RDCSRS of 5,100 mg/kg (**Table 1**). Therefore, the results of the compliance averaging indicate that soil at FTMM-66 meets the residential remedial goal for EPH. Based on this evaluation, a NFA determination is warranted for the FTMM-66 site soils.

6.0 SUMMARY

In summary, the Army requests a no further action determination for FTMM-66 because: 1) LNAPL recovery was completed; 2) groundwater monitoring was discontinued, as accepted by NJDEP; and 3) compliance averaging indicates that soil meets the residential remedial goal for EPH.

The technical Point of Contact for this matter is Kent Friesen; he can be reached 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, CHMM, PG
BRAC Environmental Coordinator

cc: Linda Range (3 hard copies)
Joseph Pearson, Calibre (CD)
James Moore, USACE (CD)
James Kelly, USACE (CD)
Cris Grill, Parsons (CD)

REFERENCES CITED:

- EDAW, Inc. 2008. Fort Monmouth Reuse and Redevelopment Plan, Final Plan. Prepared for Fort Monmouth Economic Revitalization Planning Authority. August 22.
- NJDEP, 2010a. Protocol for Addressing Extractable Petroleum Hydrocarbons. Version 5.0, August 9.
- NJDEP, 2010b. Health Based and Ecological Screening Criteria for Petroleum Hydrocarbons, Frequently Asked Questions. Version 4.0, August 9.
- NJDEP, 2012. Technical Guidance for the Attainment of Remediation Standards and Site Specific Criteria. September 24.



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:

- "Letter Work Plan for FTMM-66, Building 886 Former Aboveground Storage Tank, Fort Monmouth, New Jersey" (15 August 2017)

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: _____

Date: _____

Name/Title: William R. Colvin, PMP, CHMM, PG
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



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
Division of Remediation Management & Response
Northern Bureau of Field Operations
7 Ridgedale Avenue (2nd Floor)
Cedar Knolls, NJ 07927-1112

**SUBJECT: Letter Work Plan for FTMM-66
Building 886 Former Aboveground Storage Tank
Fort Monmouth, New Jersey
PI G000000032**

Dear Mr. Joshi:

The purpose of this work plan is to obtain confirmation samples at select locations at FTMM-66 to address the New Jersey Department of Environmental Protection (NJDEP) comments that previous soil sample results exceeded the residual product/free product limit of 8,000 milligrams per kilogram (mg/kg) of total petroleum hydrocarbons (TPH). The sampling is intended to obtain current information so that the environmental conditions at FTMM-66 can be accurately described in property transfer documents. The results of this sampling will be presented in a letter report to supplement the site characterization previously provided in ***Summary Remedial Investigation Report and NFA Request for FTMM-66 Building 886 Former Aboveground Storage Tank, Fort Monmouth, NJ***. (6 April 2017).

FTMM-66 was initially associated with Building 886. A 1,000-gallon fuel oil underground storage tank (UST) removed in 1998 and a 250,000-gallon fuel oil above-ground storage tank (AST) removed in the 1970's were contributing sources of soil and groundwater contamination. In 2002 and 2003, approximately 4,000 tons of petroleum-contaminated soil was excavated and removed. The presence of high-voltage electric lines limited the westward extent of the soil excavation; thus, a Light Non-Aqueous Phase Liquid (LNAPL) recovery system was installed in 2003 near these subsurface electric lines. The Army's 6 April 2017 NFA request for FTMM-66 was based on multiple lines of evidence including compliance averaging. In NJDEP's 17 April 2017 email (attached) it was stated that the submittal could not be evaluated because petroleum hydrocarbons were present above the residual or free product limit of 8,000 mg/kg. Since the soil data in the Army's 6 April 2017 submittal was generated in 2003 and earlier, additional soil sampling is proposed to determine the current extractible petroleum hydrocarbons (EPH) concentrations in representative areas that previously exceeded the 8,000 mg/kg limit.

Eight Geoprobe borings will be installed for supplemental characterization as shown on the attached figure. Boring 886-SB-01 through 886-SB-08 will be installed at the previous locations of Boring 886-PX14A, 886-PX15A, 886-PX19, 886-PX24, 886-PX26, 886-PX30, 886-41, and 886-57. Each boring

will be advanced to approximately 12 feet below ground surface (ft bgs), which is approximately 4 ft below the water table. Two soil samples will be collected from each boring:

- One sample from the same depth interval as the previous sample with elevated TPH concentrations (for example, from 7.5 to 8.0 ft bgs for boring 886-SB-06, to match the previous 7.5 to 8.0 ft bgs sample depth for 886-PX24); and
- One sample from the most contaminated interval encountered based on field evidence (visual, olfactory, and photoionization detector [PID] screening). If there is no field evidence of petroleum contamination, then this sample will be collected from just above the water table.

Soil samples will be analyzed 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*. Each soil sample will be analyzed for EPH, and a minimum of 25 percent of the soil samples where EPH is detected above 1,000 mg/kg will be analyzed for the semivolatile organic compounds (SVOCs) naphthalene and 2-methylnaphthalene. One soil sample will be selected from each boring to satisfy this requirement for analysis of naphthalene and 2-methylnaphthalene, and will be collected from either the sample with the greatest field indication of petroleum contamination, or from just above the water table if there is no field evidence of contamination. A summary of the soil and groundwater sampling and analysis is presented in the attached table.

We look forward to your review of this proposed work plan and approval or additional comments. The technical Point of Contact (POC) is Kent Friesen at (732) 383-7201 or by email at kent.friesen@parsons.com. If you have any questions or require additional information, I can be reached at (732) 380-7064 or by email at william.r.colvin18.civ@mail.mil.

Sincerely,

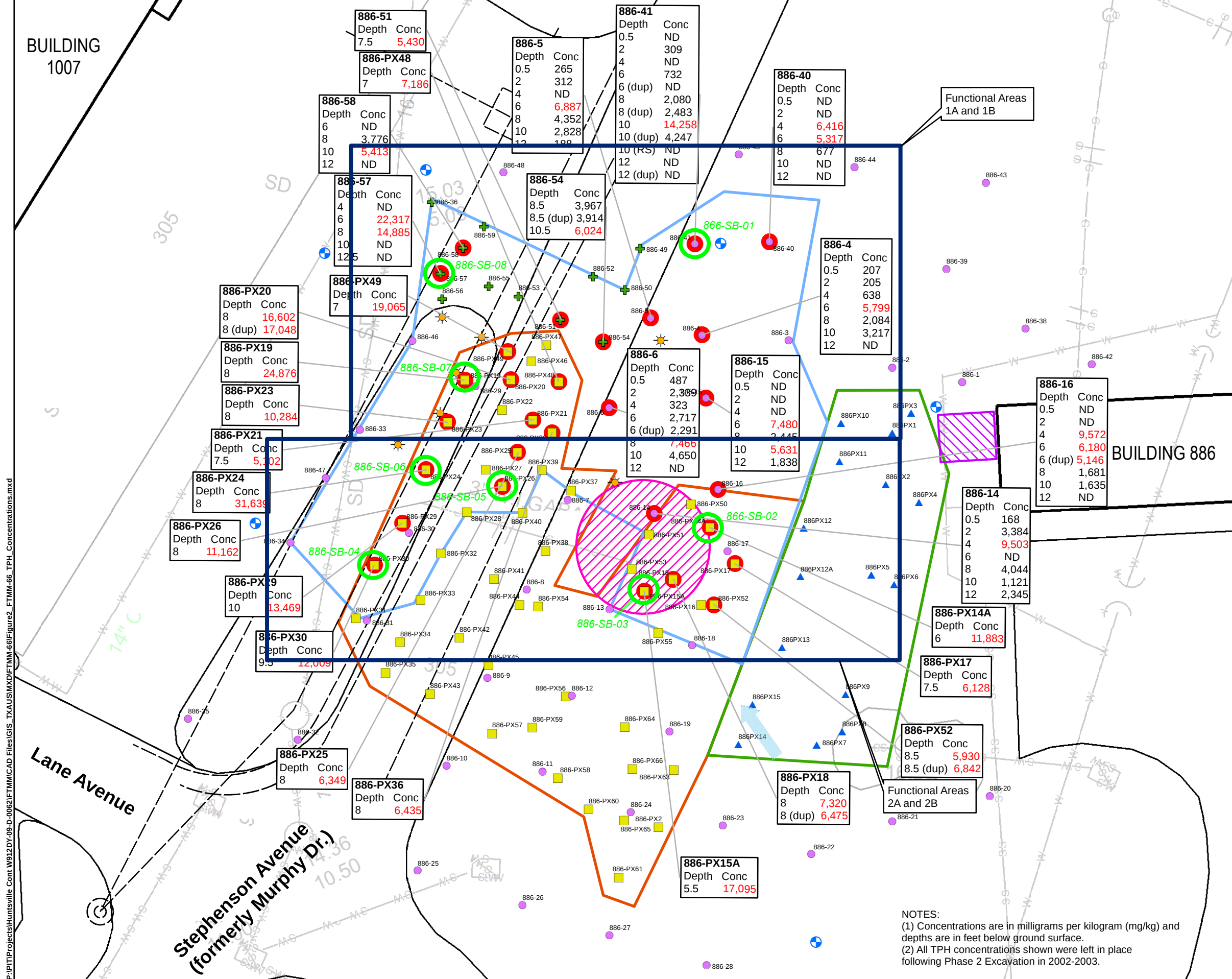


William R. Colvin, PMP, CHMM, PG
BRAC Environmental Coordinator

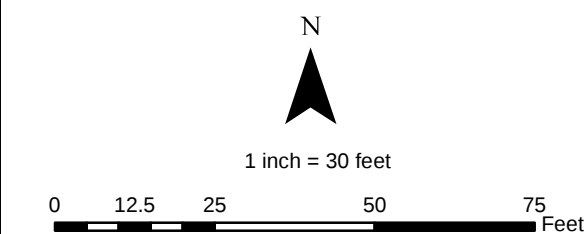
Attachments

Figure 1 - FTMM-66 Proposed Sample Locations
Table 1 - Sampling Summary for the FTMM-66 Area Work Plan
Email Correspondence Concerning FTMM-66

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)
Cris Grill, Parsons (e-mail)



- LEGEND:**
- Phase 1 Post-Excavation Soil Sample (January - March 2002)
 - Phase 1 RI Soil Boring (March - June 2002)
 - Phase 2 RI Soil Boring (November 2002)
 - Phase 2 Post-Excavation Soil Sample (November 2002 - February 2003)
 - Shallow Monitoring Well
 - Recovery Well
 - Sample Location with TPH > 5,100 mg/Kg
 - Former Aboveground Storage Tank
 - Former Underground Storage Tank
 - Extent of Soil TPH > 5,100 mg/kg remaining after Phase 2 Excavation
 - FTMM-66 Phase 1 Excavation
 - FTMM-66 Phase 2 Excavation
 - W Water Line
 - SS Sanitary Sewer Line
 - SW Storm Sewer Line
 - G Gas Line
 - Estimated Groundwater Flow Direction
 - Subsurface Electric Utility Lines
 - Functional Area
 - Proposed Sample Location



Source: FTMM Supplied CAD, 2013.

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

FTMM-66 Proposed Sample Locations

CREATED BY: RR	REVIEWED BY: JH
DATE: MAR. 2017	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-02170	FILE: Figure2_FTMM-66_TPH_Concentrations.mxd

NOTES:
(1) Concentrations are in milligrams per kilogram (mg/kg) and depths are in feet below ground surface.
(2) All TPH concentrations shown were left in place following Phase 2 Excavation in 2002-2003.

TABLE 1
SAMPLING SUMMARY FOR FTMM-66 LETTER WORK PLAN
FORT MONMOUTH, NEW JERSEY

Site	Location	Field Meter Readings ^{a/}	Unfractionated EPH ^{b/}	SVOCs + TICs by Method 8270C ^{c/}	Rationale
Soil					
886-SB-01	See Figure 1: 1 soil boring at former location of 886-41	1 boring	2	1	Purpose: characterize soils from previous (March 2002) 886-41 boring with TPH> 5,100 mg/kg.
886-SB-02	See Figure 1: 1 soil boring at former location of 886-PX14A	1 boring	2	1	Purpose: characterize soils from previous (November 2002-February 2003) 886-PX14A boring with TPH> 5,100 mg/kg.
886-SB-03	See Figure 1: 1 soil boring at former location of 886-PX15A	1 boring	2	1	Purpose: characterize soils from previous (November 2002-February 2003) 886-PX15A boring with TPH> 5,100 mg/kg.
886-SB-04	See Figure 1: 1 soil boring at former location 886-PX26	1 boring	2	1	Purpose: characterize soils from previous ((November 2002-February 2003) 886-PX26 boring with TPH> 5,100 mg/kg.
886-SB-05	See Figure 1: 1 soil boring at former location 886-PX30	1 boring	2	1	Purpose: characterize soils from previous (November 2002-February 2003) 886-PX30 boring with TPH> 5,100 mg/kg.
886-SB-06	See Figure 1: 1 soil boring at former location 886-PX24	1 boring	2	1	Purpose: characterize soils from previous (November 2002-February 2003) 886-PX24 boring with TPH> 5,100 mg/kg.
886-SB-07	See Figure 1: 1 soil boring at former location 886-PX19	1 boring	2	1	Purpose: characterize soils from previous (November 2002 - February 2003) 886-PX19 boring with TPH> 5,100 mg/kg.
886-SB-08	See Figure 1: 1 soil boring at former location 886-57	1 boring	2	1	Purpose: characterize soils from previous (November 2002) 886-57 boring with TPH> 5,100 mg/kg.
QA/QC samples (see SAP for additional details) ^{e/}					
Field Duplicates (5% Sampling Frequency per media)		NA	1	1	
Matrix Spike (5% Sampling Frequency per media)		NA	1	1	
Matrix Spike Duplicate (5% Sampling Frequency per media)		NA	1	1	
Trip Blank (1 per cooler of VOCs per media)		NA	0	0	
QA Split (5% per media)		NA	1	1	
Equipment Blank (5% Sampling Frequency per media)		NA	1	1	
TOTAL		NA	21	13	

Notes:

NA = not applicable.

^{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/} EPH = extractable petroleum hydrocarbons. 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 will also be analyzed for 2-methyl;naphthalene and naphthalene

^{c/} SVOCs = naphthalene and 2-methylnaphthalene only

Friesen, Kent

From: Range, Linda <Linda.Range@dep.nj.gov>
Sent: Tuesday, April 25, 2017 1:07 PM
To: Friesen, Kent
Cc: Moore, James T CIV USARMY CENAN (US); Grill, Cris
Subject: RE: M-66 - Summary Remedial Investigation Report & Request for No Further Action for Site FTMM-66

Hi Kent,

I agree, with original numbers as high those reported, it's possible soils at FTMM-66 may still exceed the 8,000 mg/kg residual product/free product "cap"/limit. We cannot consider soils with levels above 8,000 mg/kg for compliance averaging; according to the protocol/policy, etc, soils above 8,000 mg/kg are to be remediated (actively remediated). They are considered representative of at least residual product and therefore potential source material.

We can certainly discuss, but up to you whether you wish to go ahead to determine current conditions in hope that results below 8,000 ppm will allow for compliance averaging, or consider additional alternative action - excavation, etc.

From: Friesen, Kent [mailto:Kent.Friesen@parsons.com]
Sent: Monday, April 24, 2017 4:03 PM
To: Range, Linda <Linda.Range@dep.nj.gov>
Cc: Moore, James T CIV USARMY CENAN (US) <James.T.Moore@usace.army.mil>; Grill, Cris <Cris.Grill@parsons.com>
Subject: RE: M-66 - Summary Remedial Investigation Report & Request for No Further Action for Site FTMM-66

Hi Linda – Jim and I discussed this morning; based on your response we are looking at performing additional soil sampling at this site to support the claim of TPH/EPH degradation. But if we still exceed the 8,000 mg/kg EPH residual/free product limit, could the State consider further review of the compliance averaging approach, since the Army installed and operated a free produce recovery system?

It seems quite possible that this FTMM-66 site may exceed the 8,000 mg/kg free product limit, even though recoverable or mobile free product is no longer present. – Kent Friesen

Kent A. Friesen, P.E., P.G.

PARSONS

Fort Monmouth BRAC 05 Facility
P.O. Box 148
Oceanport, NJ 07757
Office: (732) 383-7201
Mobile: (307) 214-0324
Fax: (732) 383-8960
kent.friesen@parsons.com

SAFETY - MAKE IT PERSONAL

From: Range, Linda [mailto:Linda.Range@dep.nj.gov]
Sent: Monday, April 17, 2017 1:42 PM
To: william.r.colvin18.civ@mail.mil
Cc: Moore, James T NAN02 (James.T.Moore@usace.army.mil) <James.T.Moore@usace.army.mil>; Pearson, Joseph <Joseph.Pearson@calibresys.com>; Friesen, Kent <Kent.Friesen@parsons.com>
Subject: M-66 - Summary Remedial Investigation Report & Request for No Further Action for Site FTMM-66

Bill,

As you may recall, submittals incorporating use of the 95% UCL method for compliance averaging are referred to another group for review. In performing my preliminary review prior to referral, however, an issue was noted. As referenced in the submittal (2nd paragraph of Section 5.0, and as per my previous email of June 23, 2016)), DEP policy states TPH/EPH cannot exceed the residual product/free product limit of 8,000 mg EPH/kg for No. 2 fuel. Although it is agreed natural degradation has likely taken place in the intervening years since the 2003 post excavation data was generated, more recent sampling has not been performed to substantiate the extent to which natural degradation may have taken place, and the levels from '03 were significantly elevated (e.g. 24,876 ppm; 31,639 ppm).

After discussion with management, as no evidence has been provided to demonstrate EPH is now below 8,000 mg/kg, it was determined FTMM-66 is not eligible for compliance averaging and the submittal will not be referred for further review.

Please contact me to discuss further.

Linda S. Range
Site Remediation Program
Bureau of Case Management
609-984-6606



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

November 2, 2017

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

Re: Work Plan for FTMM-66 Building 886 Former Aboveground Storage Tank
Fort Monmouth, Oceanport, Monmouth County
Preferred ID: G000000032

Dear Mr. Colvin:

The New Jersey Department of Environmental Protection (Department) has completed review of the Work Plan for FTMM-66 Building 886 Former Aboveground Storage Tank (Workplan). Based on the review, the Department approves the workplan to obtain confirmation soil samples at locations that previously were found to exceed Department's soil cleanup criteria.

Please submit the findings to my attention for review. Thank you and please feel free to contact me if you have any questions.

Sincerely,

A.J. Joshi

C: Jim Moore, BRAC Project Manager
Cristina Grill, Parsons
Kent Friesen, Parsons
Joe Fallon, FMERA
File

Friesen, Kent

From: Range, Linda <Linda.Range@dep.nj.gov>
Sent: Tuesday, April 25, 2017 1:07 PM
To: Friesen, Kent
Cc: Moore, James T CIV USARMY CENAN (US); Grill, Cris
Subject: RE: M-66 - Summary Remedial Investigation Report & Request for No Further Action for Site FTMM-66

Hi Kent,

I agree, with original numbers as high those reported, it's possible soils at FTMM-66 may still exceed the 8,000 mg/kg residual product/free product "cap"/limit. We cannot consider soils with levels above 8,000 mg/kg for compliance averaging; according to the protocol/policy, etc, soils above 8,000 mg/kg are to be remediated (actively remediated). They are considered representative of at least residual product and therefore potential source material.

We can certainly discuss, but up to you whether you wish to go ahead to determine current conditions in hope that results below 8,000 ppm will allow for compliance averaging, or consider additional alternative action - excavation, etc.

From: Friesen, Kent [mailto:Kent.Friesen@parsons.com]
Sent: Monday, April 24, 2017 4:03 PM
To: Range, Linda <Linda.Range@dep.nj.gov>
Cc: Moore, James T CIV USARMY CENAN (US) <James.T.Moore@usace.army.mil>; Grill, Cris <Cris.Grill@parsons.com>
Subject: RE: M-66 - Summary Remedial Investigation Report & Request for No Further Action for Site FTMM-66

Hi Linda – Jim and I discussed this morning; based on your response we are looking at performing additional soil sampling at this site to support the claim of TPH/EPH degradation. But if we still exceed the 8,000 mg/kg EPH residual/free product limit, could the State consider further review of the compliance averaging approach, since the Army installed and operated a free produce recovery system?

It seems quite possible that this FTMM-66 site may exceed the 8,000 mg/kg free product limit, even though recoverable or mobile free product is no longer present. – Kent Friesen

Kent A. Friesen, P.E., P.G.

PARSONS

Fort Monmouth BRAC 05 Facility
P.O. Box 148
Oceanport, NJ 07757
Office: (732) 383-7201
Mobile: (307) 214-0324
Fax: (732) 383-8960
kent.friesen@parsons.com

SAFETY - MAKE IT PERSONAL

From: Range, Linda [mailto:Linda.Range@dep.nj.gov]
Sent: Monday, April 17, 2017 1:42 PM
To: william.r.colvin18.civ@mail.mil
Cc: Moore, James T NAN02 (James.T.Moore@usace.army.mil) <James.T.Moore@usace.army.mil>; Pearson, Joseph <Joseph.Pearson@calibresys.com>; Friesen, Kent <Kent.Friesen@parsons.com>
Subject: M-66 - Summary Remedial Investigation Report & Request for No Further Action for Site FTMM-66

Bill,

As you may recall, submittals incorporating use of the 95% UCL method for compliance averaging are referred to another group for review. In performing my preliminary review prior to referral, however, an issue was noted. As referenced in the submittal (2nd paragraph of Section 5.0, and as per my previous email of June 23, 2016)), DEP policy states TPH/EPH cannot exceed the residual product/free product limit of 8,000 mg EPH/kg for No. 2 fuel. Although it is agreed natural degradation has likely taken place in the intervening years since the 2003 post excavation data was generated, more recent sampling has not been performed to substantiate the extent to which natural degradation may have taken place, and the levels from '03 were significantly elevated (e.g. 24,876 ppm; 31,639 ppm).

After discussion with management, as no evidence has been provided to demonstrate EPH is now below 8,000 mg/kg, it was determined FTMM-66 is not eligible for compliance averaging and the submittal will not be referred for further review.

Please contact me to discuss further.

Linda S. Range
Site Remediation Program
Bureau of Case Management
609-984-6606



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

November 14, 2016

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

Re: *Annual (Fourth Quarter) 2015 Groundwater Sampling Report dated September 2016*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin:

The New Jersey Department of Environmental Protection (NJDEP) has completed review of the referenced report, received September 29, 2016, prepared by Parsons to support the Remedial Investigation (RI), Feasibility Study (FS), and Decision Documents project at Fort Monmouth. An annual ground water sampling event was conducted at twelve (12) FTMM sites between September 30, 2015 and December 15, 2015. Sampling methodologies used included low-flow purging and sampling (LFPS) and passive diffusion bag samplers (PDBS). Comments on each FTMM site are as follows:

FTMM-02 Landfill

Historic sampling results at FTMM-02 have exhibited exceedances of the Ground Water Quality Standard (GWQS) for VOCs. Results from the 2015 annual sampling event exceeded the GWQS for MTBE and TBA in M2MW22. The report recommends biennial sampling of M2MW03, M2MW10 and M2MW22 as part of the biennial sampling requirements for the existing CEA for this site. The exiting CEA will also be revised to include TBA and MTBE. The recommendation is acceptable. At any point where a decision is made to terminate ground water sampling at this parcel, confirmatory sampling using low-flow methodology is required.

FTMM-05 Landfill

Historic sampling results at FTMM-05 have exhibited exceedances of the GWQS for PCE, TCE and vinyl chloride. Results from the 2015 annual sampling event exceeded GWQS for PCE in wells M5MW11, M5MW16, M5MW20 and M5MW23. The report recommends the

establishment of a CEA, with biennial ground water sampling of wells M5MW11, M5MW16, M5MW20 and M5MW23 for VOCs as the "preferred remedy". Although an essential component of certain ground water remedies, a CEA is an institutional control rather than a remedy. A remedial action proposal, e.g. Monitored Natural Attenuation (MNA), in accordance with the applicable requirements of N.J.A.C. 7:26E-5.1, must be submitted to address the ground water contaminants. At such time as the formal proposal for a CEA is to be submitted, the proposal must be accompanied by a CEA/WRA Fact Sheet Form; the form and form instructions may be obtained from the Site Remediation website at www.nj.gov/dep/srp/srra/forms/. Submittal of a draft CEA/WRA Fact Sheet Form is recommended to allow for DEP confirmation of the CEA components and boundaries.

FTMM-08 Landfill

Historic sampling results at FTMM-08 exhibited exceedances of the GWQS for pesticides, benzene, PCE and lead. Results from the 2015 annual sampling event exceeded the GWQS for PCE, lead and pesticides. The 2016 RIR for FTMM-08, however, indicated manganese is also a contaminant of concern which requires monitoring. The submittal recommends the establishment of a CEA, with biennial ground water sampling for the contaminants of concern from selected wells. As above, although an essential component of certain ground water remedies, a CEA is an institutional control rather than a remedy. A remedial action proposal, e.g. Monitored Natural Attenuation (MNA), in accordance with the applicable requirements of N.J.A.C. 7:26E-5.1, must be submitted to address the ground water contaminants. At such time as the formal proposal for a CEA is to be submitted, the proposal must be accompanied by a CEA/WRA Fact Sheet Form; the form and form instructions may be obtained from the Site Remediation website at www.nj.gov/dep/srp/srra/forms/. Submittal of a draft CEA/WRA Fact Sheet Form is recommended to allow for DEP confirmation of the CEA components and boundaries.

FTMM-18 Landfill

Historic sampling results at FTMM-18 exhibited exceedances of the GWQS for benzene and 1,2-DCA. Results from the annual 2015 sampling event exceed the GWQS for benzene in well 296MW06. In the October 2015 RIR for FTMM-18, it was indicated that manganese is also a contaminant of concern, which requires monitoring. The report recommends the establishment of a CEA as the preferred remedy, with biennial ground water sampling for the contaminants of concern from selected wells. As above, although an essential component of certain ground water remedies, a CEA is an institutional control rather than a remedy. A remedial action proposal, e.g. Monitored Natural Attenuation (MNA), in accordance with the applicable requirements of N.J.A.C. 7:26E-5.1 and guidance documents, must be submitted to address the ground water contaminants. At such time as the formal proposal for a CEA is to be submitted, the proposal must be accompanied by a CEA/WRA Fact Sheet Form; the form and form instructions may be obtained from the Site Remediation website at www.nj.gov/dep/srp/srra/forms/. Submittal of a draft CEA/WRA Fact Sheet Form is recommended to allow for DEP confirmation of the CEA components and boundaries.

FTMM-22 - Former Wastewater Treatment Lime Pit

Historic sampling results at FTMM-22 exhibited exceedances of the GWQS for TCE and vinyl chloride. Results from the annual 2015 sampling event also exceeded the GWQS for TCE and vinyl chloride. Long-term ground water monitoring has been suspended while the remedial investigation/feasibility study (RI/FS) is being conducted. Upon completion of the RI/FS, a revised monitoring program will be proposed. The recommendation is acceptable.

FTMM-53 - Former Gas Station at Building 699

Historic sampling results at FTMM-53 exhibited exceedances of the GWQS for benzene, PCE, TCE, TBA, VOC TICs and lead. Results from the 2015 annual sampling event exceeded the GWQS for benzene, PCE, 1,2,4-trimethylbenzene, and VOC TICs. Long-term ground water monitoring has been suspended while the RI/FS is being conducted. Upon completion of the RI/FS, a revised monitoring program will be proposed. The recommendation is acceptable.

FTMM-56 – Building 80 Petroleum Release

Historic sampling results at FTMM-56 exhibited exceedances of the GWQS for pesticides and metals. Recently, one additional round of sampling from two wells was required; results from the 2015 annual sampling event found a single exceedance of the GWQS, of arsenic, however, the arsenic concentration is determined to be representative of background conditions, and no further action for ground water is necessary.

FTMM-57 - Building 108 UST Gasoline Release

Historic sampling results at FTMM-57 exhibited an exceedance of the GWQS for lead. Results from the 2015 annual sampling event were below the GWQS for lead; no further action for ground water is acceptable.

FTMM-58 - Building 2567 UST Gasoline

Historic sampling results at FTMM-58 exhibited exceedances of the GWQS for TBA. Results from the 2015 annual sampling event continue to exceed the GWQS for TBA. The submittal recommends continued sampling of well 2567MW01 and the addition of downgradient well 2567MW05 for TBA. One additional round of sampling is recommended for monitoring of 2567MW03 for TBA to confirm compliance for same. The recommendations are acceptable.

Evaluations regarding potential benzene exceedances relative to FTMM-58 continue under separate investigative efforts.

FTMM-64 - Building 812 UST Gasoline

Historic sampling results at FTMM-64 exhibited exceedances of the GWQS for benzene, vinyl chloride and metals. Although results from the 2015 annual sampling event were below the GWQS for contaminants of concern, due to previous analytical results, the submittal recommends continued annual sampling of well 812MWS04 for VOCs. The recommendation is acceptable. If a decision is made to terminate ground water sampling at FTMM-64, confirmatory sampling using the low-flow methodology will be required.

FTMM-66 - Building 886 Former AST

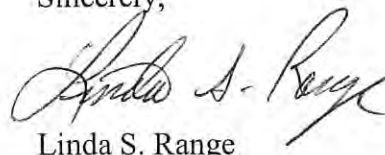
Historic sampling results from wells at FTMM-66 exhibited exceedances of the GWQS for SVOC TICs; results from the 2015 annual sampling event did not exceed the GWQS for SVOC TICs. The submittal recommends the ground water sampling at FTMM-66 be discontinued. The recommendation is acceptable; no further action for ground water is necessary.

FTMM-68 - Building 700 Former Dry Cleaners

Historic sampling results have shown exceedances of the GWQS for PCE, TCE, cis-1,2-DCE and vinyl chloride in ground water. Results from the 2015 annual sampling event confirmed these chlorinated VOCs continue to exceed GSQS in ground water. Long-term ground water monitoring has been suspended until such time as the RI/FS is completed. Upon completion of the RI/FS, a revised monitoring program will be proposed. The recommendation is acceptable.

Please contact this office if you have any questions.

Sincerely,



Linda S. Range

C: James Moore, USACE
Cris Grill, Parsons
Joe Pearson, Calibre
Rick Harrison, FMERA
Joe Fallon, FMERA
Daryl Clark, BGWPA

Attachment B
Field Notes

2 30

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.

1445 CREW LOADS TRAILER AND VEHICLE
 WITH EQUIPMENT

1455 FRANK LEADS CREW TO EGRESS
 GATE. OBTAIN SAMPLES FOR SB-38
 ANALYTICALS.

1520 DEPART PAR 83 OFFICE FOR
 SAMPLE MANAGEMENT.

1600 COLLECT EQUIPMENT BLANK FOR
 PAH'S AND ARSENIC.

1630 DEPART SITE

JUN 11/15/17

31

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

0730 MEET CREW DISCUSS HAS ISSUES
 WITH RAIN SOF.

0830 CALIBRATE PID 0.0 AIR AND 100 ppm
 ISO BUTYL GEL PINK #22589 MINI PAR 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 INVESTIGATION 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

JUN 11/16/17

Location FTMMDate 11-16-17Project / Client USACEPAR 83

TMW-01 IS A 3' WELL IN ELEVATION THAN
MW-03

1215 DOWN IN TMW-01 RISING FROM
11' DEPTH

1230 BREAK FOR LUNCH

1315 CREW LOADS MACHINES 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 BORING HOLES

1505 CREW CLEANS AREA AND QUADS

VEHICLE FA REPORTS 8.1' BG5 TO GN 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
LOC PERMITS.

1605 TH OFF-SITE.

1700 AC OFF-SITE

Location _____

Date _____

Project / Client _____

Location FTMMDate 11-16-17Project / Client USACE
PAR 83TMM-01 IS A 3' WELL IN ELEVATION THAN
MM-071215 DPM IN TMM-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 BORING HOLES

1505 CREW CLEANS AREA AND LOADS

VEHICLE FA REPORTS 8.1' BG5 TO GN AT TMM-01

1510 CREW OFFSITE FOR THE DAY

1530 MEET FRANK A. AT TMM-01
TO ASSIST WITH BACKFILLING BORING
AFTER REMOVAL OF TEMPORARY 1" PVC
WELL POINT SCREEN AND CASING1545 RETURN TO THE OFFICE TO COMPLETE
COC FORMS.1605 TH off-site.
1700 NL off-siteLocation FTMMDate 11-17-17Project / Client USACEFTMM-66-886 SOIL BORINGS0730 ONSITE, WEATHER CLEAR 50°F, WINDY
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 TRAILER

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-MM-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' 10' ARE SIMILAR,
BASED UPON INFORMATION GENERATED FROM
ADJACENT SOIL BORINGS, WE EXPECT GROUND
WATER TO BE AT A DEPTH OF 2' BG5.

1230 CUTTINGS FROM A DEPTH OF 2' ARE

- Thu 11-17-17

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

WET AND DARK-TAN-BROWN.

1225 AT 15' ADD FOURTH AUGER TO
 DOWN TO 18'. PLAN TO SET SCREEN FROM
 7-17' WITH AT LEAST 6" OF FLOOD-PAK
 BELOW THE BGS.

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

4 GALLONS OF WATER INSTANT AND PUG.

10' RISER (2" DIAMETER) PVC. ADD #1

MARLE AND PUGST AUGER. INSTALL 1" TIE-ROD

PIPE FOR INSTALLATION OF REMAINING SAND (FOR

USE AS CONTROL AGAINST BEARING AND

MAINTENANCE OF DEPTH).

1240 ADD THIRD BAG OF #1 MARLE. PULL
 3rd AUGER.

1245 6th BAG IS #0 MARLE SAND

MEASURED UP TO 2.5' BGS

1250 INSTALL 3/8 BENTONITE CEMENTS TO 0.5' BGS.

1300 INSTALL PROTECTIVE CASING AND ENROUTE

TO GRADE. BEARING IV CASING LAD IS 2.05'

ABOVE TOIC. CEM CRABBY DEPOSITS AUGER EIGHTS.

SKETCH OF WALL CONSTRUCTION PLANS ON WALL

CONSTRUCTION FORMS

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

11-17-17

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

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

1315 THROUGH ASPHALT BEGIN AUGERING TO
 21' TO SET THE 2" 10-SLOT SCREEN FROM
 10-20' BGS. WITH RISER TO GRADE
 AND PUG-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 PETROLEUM-LIKE ODOUR
 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") CHIPS ADDED - 2-BAGS -
 TO 8' BGS. DEPTH TO BENTONITE 2.6' BGS.

1420 CEM WADS EQUIPMENT

1430 FA WADS WALLS TO FTMM-08
 LOCATION WHICH WILL BE THE LOCATION
 FOR PUMPED BARRIERS / TEMPORARY WALL
 INSTALLATIONS ON MONDAY

11-17-17

Location FTMMDate 11-17-12Project / Client USACEFTMM-08

1500 FA TAKES NL AND JTE TO FTMM-08
AREA FOR REVIEW

1520 CHECK BOTTLENECK AND COMPLETE
FORMS

1535 CALL DIVISION CHAIRMAN

1600 DEPART SITE

[Signature]
11/17/12

Location _____

Date _____

Project / Client _____

Attachment C
Soil Boring Logs

Soil Boring Log

CLIENT: USACE					INSPECTOR: <u>TOM HORN</u>		BORING/WELL ID: <u>FTMM-66-886-SB.01</u>	
PROJECT NAME: FTMM - ECP					DRILLER: <u>ECDI WELLS REEVE</u>		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER: <u>CLEAR, VERY WINDY</u>		<u>GRASSY AREA</u>	
PROJECT NUMBER: 748810-					CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u>			
GROUNDWATER OBSERVATIONS					RIG TYPE: <u>Geoprobe(R) 7822DT 6610DT</u>		LOCATION PLAN	
WATER LEVEL: <u> </u>					DATE/TIME START: <u>11-16-17 / 1340</u>		Oceanport, New Jersey	
DATE: <u> </u>					DATE/TIME FINISH: <u>11-16-17 / 1350</u>			
TIME: <u> </u>					WEIGHT OF HAMMER: <u>N/A</u>			
MEAS. FROM: <u> </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			36/60	0.0	DRY DK BROWN SILTY SAND, LOOSE TR. GRASS ROOTS			
				2.1				
1				32.0	DRY V. STIFF BLUE-GREY BROWN SANDY SILT PETRO odor			
				78				
2				92				
				110				
3								
4					NO RECOVERY			
5			48/60	122	MOIST V. STIFF OLIVE BROWN SANDY SILT STRONG PETRO. ODOR			
				135	MOIST, LOOSE LT TAN ORANGE F-C SAND STRONG PETRO ODOR			
6				180				
				286	WET DENSE BLACK-GREY-BLACK F-m SAND, LITTLE SILT, STRONG PETRO ODOR		1355	
7	FTMM-66-886- SB-01-7-7.5			301				
				355	WET REDDISH-ORANGE DENSE F-m SAND, LITTLE SILT STRONG PETRO ODOR			
8				260				
				102				
9								
					NO RECOVERY			
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	
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	
							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</u> PROJECT NUMBER: <u>748810-</u>					INSPECTOR: <u>TOM HORN</u> DRILLER: <u>ECDI WELLS REEVE</u> WEATHER: <u>Clear, 50° Windy</u> CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u>		BORING/WELL ID: <u>FTMM-66-886-SB-01</u> LOCATION DESCRIPTION: <u>GRASSY AREA</u> LOCATION PLAN: <u>Oceanport, New Jersey</u>																
GROUNDWATER OBSERVATIONS: WATER LEVEL: _____ DATE: _____ TIME: _____ MEAS. FROM: _____					RIG TYPE: <u>Geoprobe(R) 7822DT 6610DT</u> DATE/TIME START: <u>11-16-17 1340</u> DATE/TIME FINISH: <u>11-16-17 1350</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																
1 ⁰	FTMM-66-886-SB01-10-10.5			21.4	SAA		1350																
				19.6																			
1 ¹				16.2																			
				15.2																			
1 ²					end of boring																		
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
Remarks:																							
Sample Types S - Split-Spoon U - Undisturbed Tube C - Rock Core A - Auger Cuttings					Consistency vs. Blowcount / Foot <table border="1" style="width:100%; border-collapse: collapse; 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
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																							

Soil Boring Log

CLIENT: USACE					INSPECTOR: <u>TOM HORN</u>		BORING/WELL ID: <u>FTMM-66-886-SB-02</u>	
PROJECT NAME: FTMM - ECP					DRILLER: <u>ECDI WELLS REEVE</u>		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER: <u>CLEAR, 50°F WINDY</u>		<u>GRASSY AREA</u>	
PROJECT NUMBER: 748810-					CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u>		LOCATION PLAN	
GROUNDWATER OBSERVATIONS					RIG TYPE: <u>Geoprobe(R) 7822DT 6610DT</u>		Oceanport, New Jersey	
WATER LEVEL:					DATE/TIME START: <u>11-16-17 / 1355</u>			
DATE:					DATE/TIME FINISH: <u>11-16-17 / 1410</u>			
TIME:					WEIGHT OF HAMMER: <u>N/A</u>			
MEAS. FROM:					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			48/60	0.0	DRY BROWN - GRAY BROWN STIFF <u>MOD</u> <u>DENSE SILTY SAND</u>		
				0.0	DRY REDDISH - ORANGE BROWN STIFF SANDY SILT		
1				0.0			
				6.0	MOIST STIFF GRAY - BROWN - GRAY		
2				0.0	SANDY SILT		
				0.0	PETROLEUM OIL		
3				6.0			
				20.9			
4					NO RECOVERY		
5	FTMM-66-886-SB-02-5	5.5	30/60	104.2	WET TANGLED DENSE SILTY SAND		1420
				73.0	STRONG PETROLEUM OIL		
6	FTMM-66-886-SB-02-6	6.5		47.0			1415
				35.0			
7				26			
8							
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					INSPECTOR: <u>TOM HORN</u>		BORING/WELL ID: <u>FTMM-66-886-SB-02</u>	
PROJECT NAME: FTMM - ECP					DRILLER: <u>ECDI WELLS REEVE</u>		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER: <u>CLEAR, 90°F WINDY</u>		<u>GRASSY AREA</u>	
PROJECT NUMBER: 748810-					CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u>			
GROUNDWATER OBSERVATIONS					RIG TYPE: <u>Geoprobe(R) 7822DT 6610DT</u>		LOCATION PLAN	
WATER LEVEL: <u>-</u>					DATE/TIME START: <u>11-16-17 / 1355</u>		Oceanport, New Jersey	
DATE: <u>-</u>					DATE/TIME FINISH: <u>11-16-17 / 1410</u>			
TIME: <u>-</u>					WEIGHT OF HAMMER: <u>N/A</u>			
MEAS. FROM: <u>-</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	
1.0				3.2	WET LT TAN OLIVE V LOOSE SILTY SAND SLIGHT PETER DOOR			
				1.3				
1.1				0.0				
				0.0				
1.2					end of boring			
3								
4								
5								
6								
7								
8								
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	
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	
							and - 35-50% some - 20-35% little - 10-20% trace - <10% moisture, density, color, gradation	

Soil Boring Log

CLIENT: USACE					INSPECTOR: TOM HORN		BORING/WELL ID: FTMM-66-886-SB-03	
PROJECT NAME: FTMM - ECP					DRILLER: ECDI WELLS REEVE		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER: CLEAR S ^W P WINDY		GRASSY AREA	
PROJECT NUMBER: 748810-					CONTRACTOR: East Coast Drilling, Inc. (ECDI)		LOCATION PLAN	
GROUNDWATER OBSERVATIONS					RIG TYPE: Geoprobe(R) 7822DT 6610DT		Oceanport, New Jersey	
WATER LEVEL: —					DATE/TIME START: 11-16-17/1415			
DATE: —					DATE/TIME FINISH: 11-16-17/1430			
TIME: —					WEIGHT OF HAMMER: N/A			
MEAS. FROM: —					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			36/60	0.0	DRY BROWN LOOSE SILTY SAND W/ GRASS / ROOTS			
				0.0	DENSE TAN GRAY BROWN SILTY SAND			
1				0.0				
				0.0				
2				0.0	DENSE GRAY-OLIVE-TAN BROWN SILTY SAND			
				20.0	PETROLEUM OIL			
3								
4					NO RECOVERY			
5			36/60	54.0	WET LT OLIVE-TAN GRAY MOD SOFT SANDY SILT		1450	
				21.0	STRONG PETROLEUM OIL			
6				88.0				
				104.0			1445	
7				21.0	WET LT OLIVE GRAY LOOSE F-C SAND, LITTLE SILT PETRO OIL			
				53				
8								
9								
10								
Remarks:								
Sample Types					Consistency vs. Blowcount / Foot			
S - Split-Spoon					Granular (Sand & Gravel)			
U - Undisturbed Tube					Fine Grained (Silt & Clay)			
C - Rock Core					V. Loose: 0-4 Dense: 30-50 V. Soft: <2 Stiff: 8-15			
A - Auger Cuttings					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			

Soil Boring Log

CLIENT: USACE					INSPECTOR: <u>TOM HORN</u>		BORING/WELL ID: <u>FTmm-66-886-SB-03</u>	
PROJECT NAME: FTMM - ECP					DRILLER: <u>ECDI WELLS REEVE</u>		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER:		<u>GRASSY AREA</u>	
PROJECT NUMBER: 748810-					CONTRACTOR: East Coast Drilling, Inc. (ECDI)			
GROUNDWATER OBSERVATIONS					RIG TYPE: <u>Geoprobe(R) 7822DT</u>		LOCATION PLAN	
WATER LEVEL:					DATE/TIME START: <u>11-16-17/1415</u>		Oceanport, New Jersey	
DATE:					DATE/TIME FINISH: <u>11-16-17/1430</u>			
TIME:					WEIGHT OF HAMMER: <u>N/A</u>			
MEAS. FROM:					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	
1 0				32.0	WET LT OLIVE GRAY LOOSE VF-C SAND, SOME SILT. PETROLEUM OIL OR			
				7.5				
1 1				0.4				
				0.8				
1 2					end of boring			
3								
4								
5								
6								
7								
8								
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	
C -- Rock Core					V. Soft: <2		Stiff: 8-15	
A -- Auger Cuttings					Loose: 4-10		V. Dense: >50	
					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	

Soil Boring Log

CLIENT: <u>USACE</u>					INSPECTOR: <u>TOM HORN</u>		BORING/WELL ID: <u>FTMM-66-886-SB-04</u>	
PROJECT NAME: <u>FTMM - ECP</u>					DRILLER: <u>ECDI WELLS REEVE</u>		LOCATION DESCRIPTION	
PROJECT LOCATION: <u>FTMM Parcel</u>					WEATHER: <u>CLEAR</u>		<u>GRASSY AREA</u>	
PROJECT NUMBER: <u>748810-</u>					CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u>		LOCATION PLAN	
GROUNDWATER OBSERVATIONS					RIG TYPE: <u>Geoprobe(R) 7822DT 6610DT</u>		Oceanport, New Jersey	
WATER LEVEL: <u> </u>					DATE/TIME START: <u>11-12-17 / 0915</u>			
DATE: <u> </u>					DATE/TIME FINISH: <u>11-12-17 / 0925</u>			
TIME: <u> </u>					WEIGHT OF HAMMER: <u>N/A</u>			
MEAS. FROM: <u> </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			36/60	0.0	dry dk brown mod dense silty sand tr. grass / roots		
1				0.0	dry dk brown mod stiff sandy silt little clay tr. f angular gravel		
2				0.0	moist v. stiff sandy silt and f-m angular gravel		
3							
4					NO RECOVERY		
5							
6					NO RECOVERY		
7				0.0	wet dk gray-olive mod dense silty sand		0940
8	FTMM-66-886-SB-04-7.5-8			0.0			
8	FTMM-66-886-SB-04-8-8.5			12.5	wet tan-olive mod loose silty sand tr. f rounded gravel		0945
9				12.2			
9				8.5			
10				0.0			

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: USACE					INSPECTOR: TOM HORN		BORING/WELL ID: FTMM-66-886-SB-01	
PROJECT NAME: FTMM - ECP					DRILLER: ECDI WELLS REEVE		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER:		Crossy Area	
PROJECT NUMBER: 748810-					CONTRACTOR: East Coast Drilling, Inc. (ECDI)		LOCATION PLAN	
GROUNDWATER OBSERVATIONS					RIG TYPE: Geoprobe(R) 7822DT 6610DT		Oceanport, New Jersey	
WATER LEVEL:					DATE/TIME START: 11-17-17 /			
DATE:					DATE/TIME FINISH: 11-17-17 /			
TIME:					WEIGHT OF HAMMER: N/A			
MEAS. FROM:					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	
10				0.0	WET med LOOSE VF-C TAN- GRAVEL SAND			
				0.0				
11				0.0				
				0.0				
12					end of boring			
3								
4								
5								
6								
7								
8								
9								
10								
Remarks:								
Sample Types					Consistency vs. Blowcount / Foot			
S - Split Spoon					Granular (Sand & Gravel)			
U - Undisturbed Tube					Fine Grained (Silt & Clay)			
C - Rock Core					V. Loose: 0-4 Dense: 30-50 V. Soft: <2 Stiff: 8-15			
A - Auger Cuttings					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			

Soil Boring Log

CLIENT: USACE					INSPECTOR: <u>TOM HORN</u>		BORING/WELL ID: <u>FTMM-66-886-SB-05</u>	
PROJECT NAME: FTMM - ECP					DRILLER: <u>ECDI WELLS REEVE</u>		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel <u>66-886</u>					WEATHER:		<u>ASPHALT</u>	
PROJECT NUMBER: 748810-					CONTRACTOR: East Coast Drilling, Inc. (ECDI)		LOCATION PLAN	
GROUNDWATER OBSERVATIONS					RIG TYPE: <u>Geoprobe(R) 7822DT 6610DT</u>		Oceanport, New Jersey	
WATER LEVEL: <u>-</u>					DATE/TIME START: <u>11-12-12 / 0855</u>			
DATE: <u>-</u>					DATE/TIME FINISH: <u>11-12-12 / 0910</u>			
TIME: <u>-</u>					WEIGHT OF HAMMER: <u>N/A</u>			
MEAS. FROM:					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			60/60	0.0	DRY BLACK-GRAY (ASPHALT) DENSE ANGULAR GRAVEL		
				0.0	DRY GRAY (SUBBASE) DENSE F-C SAND AND F-MB GRAVEL		
1				0.0	DRY GRAY - BROWN DENSE F-C SAND AND F GRAVEL		
				0.0			
2				0.0			
				0.0			
3				0.0			
				0.0			
4				0.0	MOIST V DENSE DK GRAY - OLIVE SANDY SILT AND F-C GRAVEL		
				0.0			
5		36/60		0.0	S.A.A		
				6.5			
6				5.1	WET DENSE OLIVE GRAY VF-F SAND, LITTLE SILT		
				88.0	SLOW PETROLEUM OIL		
7				123.0	WET DENSE OLIVE-DARK-GRAY - VF-F SAND, SOME SILT		
	FTMM-66-886-SB-05-7.5-8			160.0	SLOW PETROLEUM OIL		0920
8	FTMM-66-886-SB-05-8-8.5			18.0	WET DENSE LIGHT OLIVE-GRAY SAND, LITTLE SILT, LITTLE F-ANGULAR GRAVEL		0915
				3.6			
9				1.8	WET DENSE YELLOW-TAN F-C SAND AND F ROUNDED GRAVEL		
				1.5			
10					END OF BORING AT 10 FT.		

Remarks:

Sample Types	Consistency vs. Blowcount / Foot				
S - Split-Spoon	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		and - 35-50% soma - 20-35% limo - 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	

Soil Boring Log

CLIENT: USACE					INSPECTOR: TOM HORN		BORINGWELL ID: FTMM-66-886-SB-06	
PROJECT NAME: FTMM - ECP					DRILLER: ECDI WELLS REEVE		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER: OVERCAST 50° WINDY		GRASSY AREA	
PROJECT NUMBER: 748810-					CONTRACTOR: East Coast Drilling, Inc. (ECDI)			
GROUNDWATER OBSERVATIONS					RIG TYPE: Geoprobe(R) 7822DT 6610DT		LOCATION PLAN	
WATER LEVEL: _____					DATE/TIME START: 11-16-17/1435		Oceanport, New Jersey	
DATE: _____					DATE/TIME FINISH: _____			
TIME: _____					WEIGHT OF HAMMER: N/A			
MEAS. FROM: _____					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			48/60	0.0	DRY DK BROWN LOOSE SILTY SAND IN GRASS / ROOTS			
				0.0	DRY MOD STIFF DK REDDISH			
1				0.0	BROWN SANDY SILT,			
				0.0	TO M-C SUBANGULAR GRAVEL			
2				0.0				
				0.0	MOIST V. STIFF OLIVE-GRAY			
3				0.0	SANDY SILT			
				0.0				
4					NO RECOVERY			
5	FTMM-66-886-SB-06-55.5	60/60		102.0	MOIST DK OLIVE GRAY-BROWN		1505	
				167.6	LOOSE SILTY SAND STRONG PETROLEUM OIL			
6				92.0	WET LOOSE LT GRAY-TAN			
				83.0	SAND, LITTLE SILT STRONG PETROLEUM OIL			
7				64.0	WET, LOOSE GRAY-BROWN			
				27.0	SILTY SAND PETRO OIL			
8	FTMM-66-886-SB-06-8-05			5.8	WET OLIVE GRAY TAN		1510	
				2.3	LOOSE F-C SAND, NOT IDENTIFIED			
9				1.6	SOME SILT,			
				2.8	SLIGHT PETRO OIL			
10					end of boring			
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	
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	
							and - 35-50% some - 20-35% little - 10-20% trace - <10% moisture, density, color, gradation	

Soil Boring Log

CLIENT: USACE					INSPECTOR: <u>TOM HORN</u>		BORING/WELL ID: <u>FTMM-66-886-SB-07</u>	
PROJECT NAME: <u>FTMM - ECP</u>					DRILLER: <u>ECDI WELLS REEVE</u>		LOCATION DESCRIPTION	
PROJECT LOCATION: <u>FTMM Parcel</u>					WEATHER: _____		<u>Grassy Area</u>	
PROJECT NUMBER: <u>748810-</u>					CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u>		LOCATION PLAN	
GROUNDWATER OBSERVATIONS					RIG TYPE: <u>Geoprobe(R) 7820DT 6610DT</u>		Oceanport, New Jersey	
WATER LEVEL: _____					DATE/TIME START: <u>11-17-17 / 0930</u>		DATE/TIME FINISH: <u>11-17-17 / 0950</u>	
DATE: _____					WEIGHT OF HAMMER: <u>N/A</u>		DROP OF HAMMER: <u>N/A</u>	
TIME: _____					TYPE OF HAMMER: <u>N/A</u>			
MEAS. FROM: _____								
DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADVI REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS	
0			36/60	0.0	DRY - DK BROWN MOD DENSE SILTY SAND TR GRASS/ROOTS			
				0.0	DRY DK - GRAY TAN BROWN MOD DENSE SILTY SAND			
1				0.0	MOIST U.S. TYPE DK OLIVE - GRAY BROWN SANDY SILT			
				0.0				
2				0.0				
				0.0				
3								
					NO RECORD			
4								
5				0.0	MOIST LT TAN GRAY MOD LOOSE SAND, TR SILT			
				0.0				
6				0.0				
				34.0	MOIST OLIVE - TAN MOD SILTY SAND PETROLEUM OIL			
* 7	FTMM-66-886-SB -07-7-7.5			145.0	WET MOD DENSE BLACK STAINED GRAY SILTY SAND		1015	
				33.0				
* 8	FTMM-66-886-SB -07-8-8.5			22.0	WET OLIVE - TAN MOD LOOSE SAND, LITTLE SILT		1020	
				13.5				
9				8.5	WET LT ORANGE TAN DENSE F-m SAND, TR SILT			
				0.3				
10								
Remarks:								
Sample Types					Consistency vs. Blowcount / Foot			
S - Split-Spoon					Granular (Sand & Gravel)			
U - Undisturbed Tube					Fine Grained (Silt & Clay)			
C - Rock Core					V. Loose: 0-4 Dense: 30-50			
A - Auger Cuttings					V. Soft: <2 Stiff: 8-15			
					Loose: 4-10 V. Dense: >50			
					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 PROJECT NUMBER: 748810-					INSPECTOR: <u>TOM HORN</u> DRILLER: <u>ECDI WELLS REEVE</u> WEATHER: _____ CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u> RIG TYPE: <u>Geoprobe(R) 7822DT 6610DT</u> DATE/TIME START: <u>11-17-17 / 0930</u> DATE/TIME FINISH: <u>11-17-17 / 0950</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>FTMM-66-886-SB-07</u> LOCATION DESCRIPTION: <u>GRASSY AREA</u> LOCATION PLAN: <u>Oceanport, New Jersey</u>																		
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				0.0	S.A.A.																				
				0.0																					
11					end of boring																				
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
Remarks:																									
Sample Types S -- Split-Spoon U -- Undisturbed Tube C -- Rock Core A -- Auger Cuttings				Consistency vs. Blowcount / Foot <table border="1"> <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					INSPECTOR: TOM HORN		BORING/WELL ID: PTMM-66-886-SB-08	
PROJECT NAME: FTMM - ECP					DRILLER: ECDI WELLS REEVE		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER:		AS PLSCT	
PROJECT NUMBER: 748810-					CONTRACTOR: East Coast Drilling, Inc. (ECDI)			
GROUNDWATER OBSERVATIONS					RIG TYPE: Geoprobe(R) 7822DT 6610DT		LOCATION PLAN	
WATER LEVEL: —					DATE/TIME START: 11/17/17 1000		Oceanport, New Jersey	
DATE: —					DATE/TIME FINISH: 11/17/17 1015			
TIME: —					WEIGHT OF HAMMER: N/A			
MEAS. FROM: —					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			60/60	0.0	DRY BLACK GRAY STIFF (ASPHALT) C. Angular Gravel			
				0.0	DRY BLACK GRAY STIFF (SLOTTED) F-C SAND			
1				0.0	MOIST V. STIFF YELLOW TAW BROWN			
				0.0	LITTLE CLAY (H.R. Angular Gravel)			
2				0.0				
				0.0				
3				0.0				
				0.0				
4				0.0	MOIST DK GRAY OLIVE STIFF			
				0.0	SANDY SILT			
5				0.0	MOIST STIFF DK GRAY OLIVE BROWN			
				0.0	SANDY SILT			
* 6	FTMM-66-886-SB-08-6.6.5			0.0	WET LOOSE LT OLIVE LT TAW		1040	
				0.0	VF-C SAND			
7				0.0				
				0.0				
* 8	FTMM-66-886-SB-08-8.8.5			0.0			1045	
				0.0				
9				0.0				
				0.0				
10								
Remarks:								
Sample Types				Consistency vs. Blowcount / Foot				
S -- Split-Spoon				Granular (Sand & Gravel)				
U -- Undisturbed Tube				Fine Grained (Silt & Clay)				
C -- Rock Core				V. Loose: 0-4 Dense: 30-50 V. Soft: <2 Stiff: 8-15				
A -- Auger Cuttings				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				

Soil Boring Log

CLIENT: USACE					INSPECTOR: <u>TOM HORN</u>		BORING/WELL ID: <u>FTMM-66-886-58-08</u>	
PROJECT NAME: FTMM - ECP					DRILLER: <u>ECDI WELLS REEVE</u>		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER:		<u>As Pict</u>	
PROJECT NUMBER: 748810-					CONTRACTOR: East Coast Drilling, Inc. (ECDI)		LOCATION PLAN	
GROUNDWATER OBSERVATIONS					RIG TYPE: Geoprobe(R) 7822DT <u>6610DT</u>		Oceanport, New Jersey	
WATER LEVEL: <u>1</u>					DATE/TIME START: <u>11/17/17</u> <u>1000</u>			
DATE: <u>11/17/17</u>					DATE/TIME FINISH: <u>11/17/17</u> <u>1015</u>			
TIME: <u>1</u>					WEIGHT OF HAMMER: <u>N/A</u>			
MEAS. FROM:					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				0.0	SAA			
				0.0				
1				0.0				
				0.0				
2								
3								
4								
5								
6								
7								
8								
9								
10								
Remarks:								
Sample Types					Consistency vs. Blowcount / Foot			
S -- Split-Spoon					Granular (Sand & Gravel)			
U -- Undisturbed Tube					Fine Grained (Silt & Clay)			
C -- Rock Core					V. Loose: 0-4 Dense: 30-50 V. Soft: <2 Stiff: 8-15			
A -- Auger Cuttings					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			