



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: Request for No Further Action Determination for Soil at the Portion of FTMM-54
Within the FTMM-18 Area, Fort Monmouth, New Jersey

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: *William R. Colvin* Date: 05/18/2017

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

18 May 2017

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

**SUBJECT: Request for No Further Action Determination for Soil at the Portion of
FTMM-54 Within the FTMM-18 Area, Fort Monmouth, New Jersey
PI G000000032**

Attachments:

Figure 1 – Sample Locations for FTMM-54 within the FTMM-18 Area
Table 1 – Detected Soil Sampling Results – Comparison to NJDEP Standards,
FTMM-54
Attachment A – Correspondence
Attachment B – Previous Report
Attachment C – Boring Logs

Dear Ms. Range:

The Fort Monmouth Team is requesting a No Further Action (NFA) determination by the New Jersey Department of Environmental Protection (NJDEP) for soil at the portion of the Fort Monmouth (FTMM) Installation Restoration Program (IRP) Site FTMM-54 located within the general area of the FTMM-18 landfill. This request is based on the soil sampling results from 2016 and 2017.

Background

FTMM-54 was a former fuel distribution facility and FTMM-18 was used as a former training ground and as a landfill for the disposal of building demolition debris. We are requesting a NFA determination only for the portion of FTMM-54 located within the FTMM-18 footprint. The NJDEP agreed (Attachment A.2) that the rest of FTMM-54 located south of FTMM-18 required no additional actions and was approved for unrestricted use. The layout of FTMM-54 within the FTMM-18 area is shown on Figure 1.

The portion of FTMM-54 within FTMM-18 was excavated in 1993 to remove petroleum contaminated soil, as documented in a UST report prepared by Versar in 2001 (Attachment B). The soil removal area is also known as the Former Fuel Distribution Piping Excavation Area (Figure 1). Soil samples were collected from the perimeter of the excavation in 1993 (Versar, 2001) and further investigation was performed in 2016 and 2017 to supplement the 1993 data and

better characterize the soil in this area. Benzene concentrations were reported in one monitoring well (296MW06) within the former excavation area that were above the NJDEP Ground Water Quality Standard (GWQS).

NJDEP concurred (Attachment A.1) that remedial actions for FTMM-54 groundwater near Building 296 are complete. A Remedial Investigation (RI) Report for FTMM-18 was submitted to and approved by NJDEP (Attachment A.8). The Army clarified (Attachment A.5) in its response to NJDEP's comments on the RI that: 1) monitored natural attenuation (MNA) was the remedy for groundwater at FTMM-18; and 2) a Classification Exception Area (CEA) would be established for FTMM-18 as an institutional control (IC) for groundwater. The CEA will include the portion of FTMM-54 north of the FTMM-18 boundary.

Soil Investigation

Work was performed as described in two NJDEP approved work plans (Attachments A.3 and A.6). Soil sample locations are shown on Figure 1, and boring logs are provided in Attachment C. Soil samples were initially collected from five soil borings on 8 August 2016 and analyzed for volatile organic compounds (VOCs) plus tentatively identified compounds (VOC+TICs), EPH, and lead. As indicated on Table 1, the only exceedance of the NJDEP Residential Direct Contact Soil Remediation Standards (RDCSRSSs) was naphthalene at 6-6.5 feet below ground surface (bgs) in boring M54-SB-02. There were no exceedances of the Non-Residential Direct Contact Soil Remediation Standards (NRDCSRSSs). Benzene exceeded the Impact to Groundwater (IGW) screening level in borings M54-SB-02 and M54-SB-03. The maximum EPH concentration (602 mg/kg) was encountered in boring M54-SB-02.

Two additional borings, M54-SB-06 and M54-SB-07 (Figure 1), were installed on 9 January 2017 to address the naphthalene exceedance in boring M54-SB-02. There were no exceedances of the naphthalene RDCSRSS at boring M54-SB-06 (Table 1) and therefore samples collected at boring M54-SB-07 were not analyzed.

Based on the results of the two sampling events, the exceedance of naphthalene at M54-SB-02 is delineated and limited to the area of the former excavation. This exceedance at M54-SB-02 is located within the footprint of the FTMM-18 landfill and an RI Report for FTMM-18 has been submitted to and approved by NJDEP. A cap for FTMM-18 that will cover the M54-SB-02 area is in the design phase. The naphthalene exceedance is located 6 feet bgs which further limits exposure to contaminants of concern in soil at the portion of FTMM-54 located within the FTMM-18 landfill. The deed notice for the FTMM-18 landfill will include the footprint of the former excavation area to provide an IC to prevent exposure.

Based on the above information, a NFA determination is requested for soil at the portion of FTMM-54 located within the FTMM-18 landfill.

Linda S. Range, NJDEP

Request for NFA Determination for Soil at FTMM-54 within FTMM-18

18 May 2017

Page 3 of 3

The technical point of contact is Kent Friesen who can be reached at 732-383-7201 or email at kent.friesen@parsons.com. Should you have any questions or require additional information, please contact me at (732) 380-7064 or by email at william.r.colvin18.civ@mail.mil.

Sincerely,



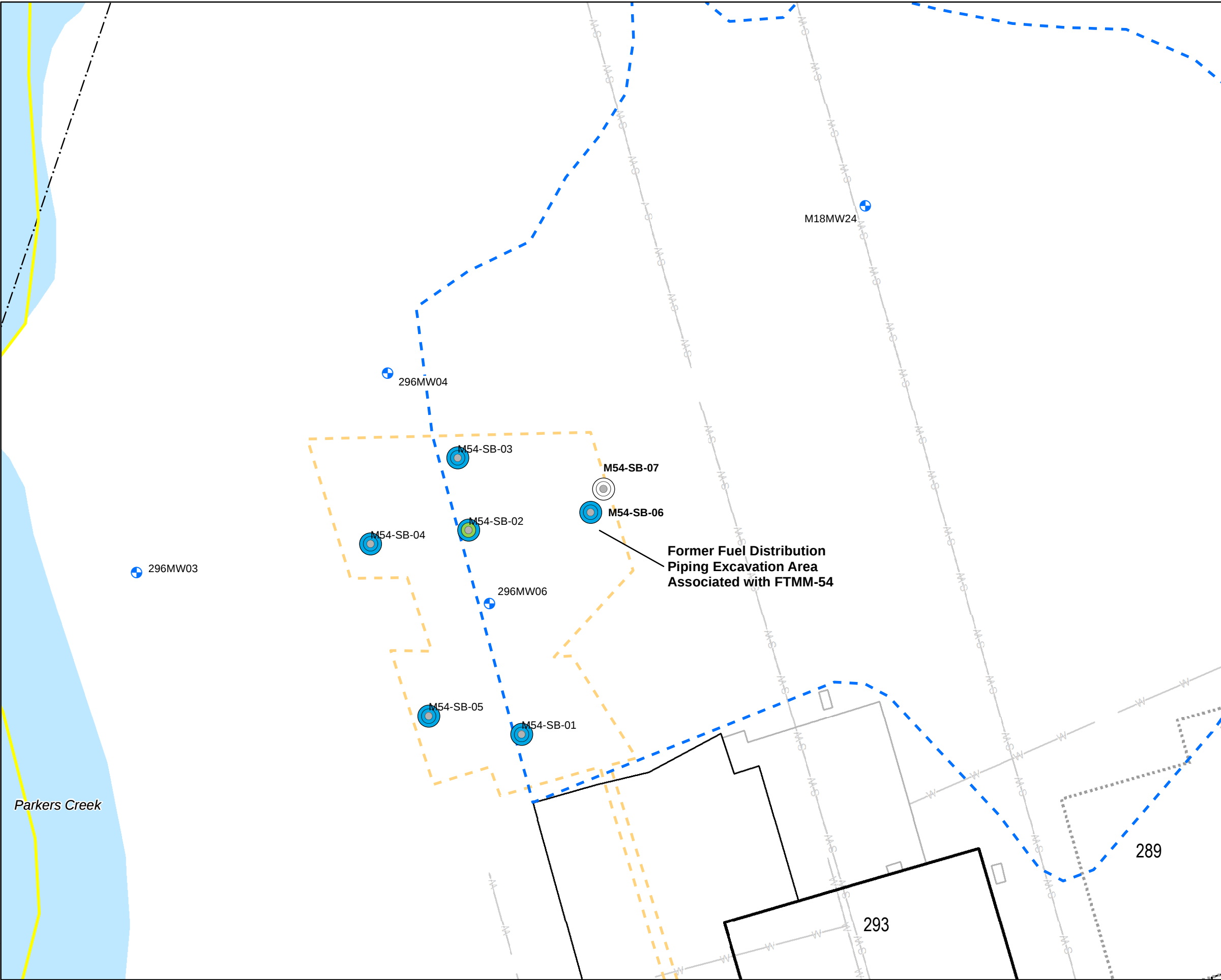
William R. Colvin, PMP, CHMM, PG
BRAC Environmental Coordinator
OACSIM – U.S. Army Fort Monmouth

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

Figures

Figure 1 Sample Locations for FTMM-54 within the FTMM-18 Area

P:\PTT\Projects\Huntsville Cont W912\DY-09-D-0062\FTMMCAD Files\GIS\FTMM-54\FIGURE 1.mxd 4/18/2017 10:17:09 AM



LEGEND:

- Soil Boring
- Shallow Monitoring Well
- Shallow Monitoring Well Associated with FTMM-54 / FTMM-55 / FTMM-61
- FTMM-18 Landfill Boundary
- FTMM-54 Boundary
- Municipal Boundary
- Installation Boundary
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Former Building (Demolished)
- Not analyzed for PAHs
- PAHs not detected or detected below RDCSRS
- PAHs exceeded RDCSRS
- Deeper (3.5-12 ft. bgs)
- Below Blue Gravel (3-7 ft. bgs)

NOTES:

RDCSRS = Residential Direct Contact Soil Remediation Standard

NRDCSRS = Non-Residential Direct Contact Soil Remediation Standard

bgs = Below Ground Surface
NE = No Exceedance
-- = Not Sampled
All results are in milligrams per kilogram.

DRAFT

N

1 inch = 30 feet

0 15 30 60 Feet

Source: FTMM Supplied CAD, 2013.

PARSONS
401 Diamond Drive NW,
Huntsville AL

Fort Monmouth
New Jersey

**SAMPLE LOCATIONS FOR
FTMM-54 WITHIN THE FTMM-18 AREA**

CREATED BY: RR	REVIEWED BY: RF
DATE: APR. 2017	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-02120	FILE: FIGURE 1.mxd

Tables

Table 1 – Detected Soil Sampling Results – comparison to NJDEP Standards,
FTMM-54

TABLE 1
DETECTED SOIL SAMPLING RESULTS - COMPARISON TO NJDEP STANDARDS
FTMM-54
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non- Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	M54-SB-01			M54-SB-02		M54-SB-03	
Sample ID				M54-SB-01-3.0-3.5	M54-SB-01-3.5-4.0	M54-SB-101-3.5-4.0	M54-SB-02-11.0-11.5	M54-SB-02-6.0-6.5	M54-SB-03-13-13.5	M54-SB-03-6.5-7
Sample Date				8/8/2016	8/8/2016	8/8/2016	8/8/2016	8/8/2016	8/8/2016	8/8/2016
Volatile Organic Compounds (mg/kg)										
1,2,4-Trimethylbenzene	NLE	NLE	NLE	< 0.001	< 0.001	< 0.0012	< 0.0011	0.076 J	< 0.001	0.023
1,3,5-Trimethylbenzene	NLE	NLE	NLE	< 0.001	< 0.001	< 0.0012	< 0.0011	0.021 J	< 0.001	0.0073
Acetone	70,000	NLE	19	0.091	0.028 J	0.072 J	0.084	0.44 J	0.091	0.26
Benzene	2	5	0.005	< 0.001	< 0.001	< 0.0012	< 0.0011	0.021 J	< 0.001	0.022
Cymene	NLE	NLE	NLE	< 0.001	< 0.001	< 0.0012	< 0.0011	0.0079 J	< 0.001	0.0019 J
Ethyl benzene	7,800	110,000	13	< 0.001	< 0.001	< 0.0012	< 0.0011	0.026 J	< 0.001	0.0046
Isopropylbenzene	NLE	NLE	NLE	< 0.001	< 0.001	< 0.0012	< 0.0011	0.018 J	< 0.001	0.016
Meta/Para Xylene	NLE	170,000	NLE	< 0.0019	< 0.0021	< 0.0024	< 0.0021	0.026 J	< 0.0021	0.0099
Methyl ethyl ketone	3,100	44,000	0.9	0.0064 J	< 0.0051	< 0.0059	0.014	0.09 J	0.0056 J	0.058
Methyl Tertbutyl Ether	110	320	0.2	0.002	< 0.001	< 0.0012	< 0.0011	< 0.0012 UJ	< 0.001	0.0017 J
Methylene chloride	34	97	0.01	0.0089 J	< 0.001	< 0.0012	< 0.0011	0.0029 J	< 0.001	0.0028 J
Naphthalene	6	17	25	0.0008 J	0.0011 J	0.001 J	0.0014 J	14.1 J	< 0.001	0.031
Ortho Xylene	NLE	170,000	NLE	< 0.001	< 0.001	< 0.0012	< 0.0011	0.025 J	< 0.001	0.007
Propylbenzene	NLE	NLE	NLE	< 0.001	< 0.001	< 0.0012	< 0.0011	0.0061 J	< 0.001	0.0078
sec-Butylbenzene	NLE	NLE	NLE	< 0.001	< 0.001	< 0.0012	< 0.0011	0.0013 J	< 0.001	0.0021 J
Toluene	6,300	91,000	7	0.0049	0.0025	0.0059	0.0018 J	0.0038 J	0.0031	0.0033 J
Trichlorofluoromethane	23,000	340,000	34	0.0029	< 0.001	< 0.0012	< 0.0011	< 0.0012 UJ	< 0.001	< 0.0017
TIC VOCs (mg/kg)										
Total TIC VOCs (mg/kg)	NLE	NLE	NLE	0.056 JN	ND	0.02 JN	ND	0.327 JN	0.027 JN	0.4946 JN
Semivolatile Organic Compounds (mg/kg)										
Naphthalene	6	17	25	NA	NA	NA	NA	NA	NA	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)										
C10-C12 Aromatics	NLE	NLE	NLE	1.2 J	1 J	0.91 J	< 1.2	52.8	0.81 J	3.3
C12-C16 Aliphatics	NLE	NLE	NLE	< 1.2 UJ	< 1.3	< 1.3	< 1.2 UJ	2.4 J	< 1.1 UJ	2.1 J
C12-C16 Aromatics	NLE	NLE	NLE	0.45 J	0.33 J	0.26 J	0.31 J	68.2	0.29 J	6.2
C16-C21 Aliphatics	NLE	NLE	NLE	< 1.2 UJ	< 1.3 UJ	< 1.3 UJ	< 1.2 UJ	1.2 J	< 1.1 UJ	1.9 J
C16-C21 Aromatics	NLE	NLE	NLE	1.2	1.3 J	1.3 J	1.3	227	1.2	20.8
C21-C36 Aromatics	NLE	NLE	NLE	0.78 J	0.74 J	0.84 J	0.83 J	235	0.55 J	34.7
C21-C40 Aliphatics	NLE	NLE	NLE	2.1 J	2.4	3.6	2.1 J	14.2 J	2.7 J	8.5 J
C9-C12 Aliphatics	NLE	NLE	NLE	0.38 J	0.4 J	0.44 J	0.38 J	1 J	0.49 J	1.4 J
Total Aliphatics	NLE	NLE	NLE	2.9 J	3.5 J	4.9 J	3 J	18.8 J	3.9 J	13.9 J
Total Aromatics	NLE	NLE	NLE	3.6 J	3.4 J	3.3 J	2.4 J	583	2.8 J	65
Total EPH	5,100	54,000	NLE	6.5 J	6.9 J	8.2 J	5.3 J	602	6.8 J	78.9
Inorganics (mg/kg)										
Lead	400	800	90	6.7	7.3	7.6	2.7	15.2	3.5	39.7

Footnotes:

NLE = no limit established.

ND = not detected

Chemical detections are bolded.

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

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

JN = Tentatively identified compound, estimated concentration.

For EPH, the Protocol For Addressing Extractable Petroleum Hydrocarbons, (Version 5.0, August 9, 2010) was used to determine the applicable standards. Based on the protocol FTMM-54 EPH results are considered category 1, and Category 1 screening criteria are used.

Result exceeds the NJ Residential and/or Non-Residential Direct Contact Soil Remediation Standard.

Result exceeds the NJ Impact to GW Soil Screening Level

Result exceeds the NJ Residential, Non-Residential, AND NJ Impact to GW Soil Screening Level Direct Contact Soil Remediation Standard.

The NJ Residential and Non-Residential Direct Contact Soil Remediation Standard refers to the NJDEP's May 7, 2012 Remediation Standards

http://www.nj.gov/dep/rules/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/dep/srp/guidance/rs/partition_equation.pdf

TABLE 1
DETECTED SOIL SAMPLING RESULTS - COMPARISON TO NJDEP STANDARDS
FTMM-54
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non- Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	M54-SB-04		M54-SB-05		M54-SB-06		
Sample ID				M54-SB-04-2.5-3	M54-SB-04-4.5-5	M54-SB-05-3-3.5	M54-SB-05-5.0-5.5	M54-SS-SB-06-11.5-12.0	M54-SS-SB-06-6.0-6.5	M54-SS-SB-106-6.0-6.5
Sample Date				8/8/2016	8/8/2016	8/8/2016	8/8/2016	1/9/2017	1/9/2017	1/9/2017
Volatile Organic Compounds (mg/kg)										
1,2,4-Trimethylbenzene	NLE	NLE	NLE	< 0.001	< 0.0009	< 0.0011	0.0007 J	NA	NA	NA
1,3,5-Trimethylbenzene	NLE	NLE	NLE	< 0.001	< 0.0009	< 0.0011	< 0.0009	NA	NA	NA
Acetone	70,000	NLE	19	0.085	0.096	0.087	0.038	NA	NA	NA
Benzene	2	5	0.005	< 0.001	< 0.0009	< 0.0011	< 0.0009	NA	NA	NA
Cymene	NLE	NLE	NLE	< 0.001	< 0.0009	< 0.0011	< 0.0009	NA	NA	NA
Ethyl benzene	7,800	110,000	13	< 0.001	< 0.0009	< 0.0011	< 0.0009	NA	NA	NA
Isopropylbenzene	NLE	NLE	NLE	< 0.001	< 0.0009	< 0.0011	< 0.0009	NA	NA	NA
Meta/Para Xylene	NLE	170,000	NLE	< 0.0021	< 0.0018	< 0.0022	< 0.0019	NA	NA	NA
Methyl ethyl ketone	3,100	44,000	0.9	0.009 J	0.008 J	< 0.0056	0.0032 J	NA	NA	NA
Methyl Tertbutyl Ether	110	320	0.2	< 0.001	< 0.0009	< 0.0011	< 0.0009	NA	NA	NA
Methylene chloride	34	97	0.01	< 0.001	< 0.0009	0.0011 J	7.5 J	NA	NA	NA
Naphthalene	6	17	25	0.0007 J	0.0005 J	< 0.0011	0.0038	NA	NA	NA
Ortho Xylene	NLE	170,000	NLE	< 0.001	< 0.0009	< 0.0011	< 0.0009	NA	NA	NA
Propylbenzene	NLE	NLE	NLE	< 0.001	< 0.0009	< 0.0011	< 0.0009	NA	NA	NA
sec-Butylbenzene	NLE	NLE	NLE	< 0.001	< 0.0009	< 0.0011	< 0.0009	NA	NA	NA
Toluene	6,300	91,000	7	0.0037	0.0045	0.0082	0.0073	NA	NA	NA
Trichlorofluoromethane	23,000	340,000	34	< 0.001	< 0.0009	< 0.0011	< 0.0009	NA	NA	NA
TIC VOCs (mg/kg)										
Total TIC VOCs (mg/kg)	NLE	NLE	NLE	0.034 JN	0.037 JN	0.0274 JN	0.0164 JN	NA	NA	NA
Semivolatile Organic Compounds (mg/kg)										
Naphthalene	6	17	25	NA	NA	NA	NA	0.28 J	0.46	0.66
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)										
C10-C12 Aromatics	NLE	NLE	NLE	0.81 J	0.82 J	0.71 J	1.1 J	NA	NA	NA
C12-C16 Aliphatics	NLE	NLE	NLE	1.1 J	< 1.2 UJ	< 1 UJ	< 1.2 UJ	NA	NA	NA
C12-C16 Aromatics	NLE	NLE	NLE	0.36 J	0.26 J	0.22 J	0.36 J	NA	NA	NA
C16-C21 Aliphatics	NLE	NLE	NLE	1.3 J	< 1.2 UJ	< 1 UJ	< 1.2 UJ	NA	NA	NA
C16-C21 Aromatics	NLE	NLE	NLE	1.7	1.1 J	0.99 J	1.1 J	NA	NA	NA
C21-C36 Aromatics	NLE	NLE	NLE	1.4	0.53 J	0.35 J	0.37 J	NA	NA	NA
C21-C40 Aliphatics	NLE	NLE	NLE	2.1 J	1.2 J	0.62 J	0.79 J	NA	NA	NA
C9-C12 Aliphatics	NLE	NLE	NLE	0.66 J	0.3 J	0.41 J	0.46 J	NA	NA	NA
Total Aliphatics	NLE	NLE	NLE	5.2 J	2.1 J	1.6 J	1.8 J	NA	NA	NA
Total Aromatics	NLE	NLE	NLE	4.2 J	2.7 J	2.3 J	3 J	NA	NA	NA
Total EPH	5,100	54,000	NLE	9.4 J	4.9 J	3.9 J	4.8 J	NA	NA	NA
Inorganics (mg/kg)										
Lead	400	800	90	4.4	3.7	3.2	3.3	NA	NA	NA

Footnotes:

NLE = no limit established.

ND = not detected

Chemical detections are bolded.

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

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

JN = Tentatively identified compound, estimated concentration.

For EPH, the Protocol For Addressing Extractable Petroleum Hydrocarbons, (Version 5.0, August 9, 2010) was used to determine the applicable standards. Based on the protocol FTMM-54 EPH results are considered category 1, and Category 1 screening criteria are used.

Result exceeds the NJ Residential and/or Non-Residential Direct Contact Soil Remediation Standard.

Result exceeds the NJ Impact to GW Soil Screening Level

Result exceeds the NJ Residential, Non-Residential, AND NJ Impact to GW Soil Screening Level Direct Contact Soil Remediation Standard.

The NJ Residential and Non-Residential Direct Contact Soil Remediation Standard refers to the NJDEP's May 7, 2012 Remediation Standards

http://www.nj.gov/dep/rules/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 -

http://www.nj.gov/dep/srp/guidance/rs/partition_equation.pdf

Attachment A – Correspondence

1. NJDEP, 2015. Approval, Re: Remedial Action Type: Unrestricted Use, Scope of Remediation: Area of Concern: Ground Water at FTMM-54/Building 296, and no other areas, Fort Monmouth, Monmouth County, SRP PI# G000000032, RPC000001. February 4.
2. NJDEP, 2016. Approval. Re: Remedial Action Type: Unrestricted Use, Scope of Remediation: Area of Concern: FTMM-54 between Sherill Avenue and FTMM-18, Monmouth County, SRP PI# G000000032, RPC000001. May 4.
3. U.S. Army, 2016. Subject: Letter Work Plan Addendum for the FTMM-54 Area at FTMM-18, Fort Monmouth, New Jersey. June 28.
4. NJDEP, 2016. Re: Letter Work Plan Addendum for the FTMM-54 Area at FTMM-18, Fort Monmouth, Oceanport, Monmouth County, PI G000000032. July 7.
5. U.S. Army, 2016. Subject: Final Remedial Investigation Report for FTMM-18 dated October 2015 (& Landfill Boundary Refinement for FTMM-18 only dated January 2016), Fort Monmouth, New Jersey. November 28.
6. U.S. Army, 2016. Subject: December 2016 Letter Work Plan Addendum for the FTMM-54 Area at FTMM-18, Fort Monmouth, New Jersey. December 28.
7. NJDEP, 2017. Re: December 2016 Letter Work Plan Addendum for the FTMM-54 Area at FTMM-18, Fort Monmouth, Oceanport, Monmouth County, PI G000000032. January 10.
8. NJDEP, 2017. Re: Response to Comments to NJDEP Comments on Final Remedial Investigation Report for FTMM-18 dated October 2015 (and Landfill Boundary Refinement for FTMM-18 only dated January 2016), Fort Monmouth, Oceanport, Monmouth County, PI G000000032. March 8.



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Case Management

Mail Code 401-05F

P.O. Box 420

Trenton, New Jersey 08625-0420

Telephone: 609-633-1455

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

February 4, 2015

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

Approval

Re: **Remedial Action Type:** *Unrestricted Use*

Scope of Remediation: *Area of Concern: Ground Water at FTMM-54/Building 296, and no other areas*

Fort Monmouth

Monmouth County

SRP PI# G000000032

RPC000001

Dear Ms. Green:

The New Jersey Department of Environmental Protection (Department) has reviewed the *Request for No Further Action for Groundwater at FTMM-54* report submitted by the Department of the Army on December 3, 2014. The Department concurs with the Department of the Army that all remedial actions necessary for the ground water located within FTMM-54/Building 296 are complete. This applies to ground water only, specifically for the Building 296 parcel located along Sherrill Avenue. It does not include the area north of same, surrounding monitor well 296MW06 (as noted on Figure 1.3 of the above report), located within FTMM-18, and which will be addressed under the RI/FS report for FTMM-18. The determination that the remedial action for ground water is complete is based upon information in the Department's case file, the report submitted by the Department of the Army, and the certified representations and information provided to the Department.

If you have any questions regarding this matter contact Linda Range at (609)984-6606.

Sincerely,

Gwen B. Zervas, P.E., Section Chief
Bureau of Case Management

cc: Joe Pearson, Calibre Systems
Rich Harrison, FMERA
Joe Fallon, FMERA



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Case Management
Mail Code 401-05F
P.O. Box 420
Trenton, New Jersey 08625-0420
Telephone: 609-633-1455
Fax #: 609-633-1439

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

May 4, 2016

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

Approval

Re: **Remedial Action Type:** *Unrestricted Use*

Scope of Remediation: *Area of Concern: FTMM 54 between Sherrill Avenue and FTMM-18*
Monmouth County
SRP PI# G000000032
RPC000001

Dear Mr. Colvin:

The New Jersey Department of Environmental Protection (Department) has reviewed the November 9, 2015 report submitted by the Department of the Army. The Department concurs with the Department of the Army that no additional action is necessary for UST 296A, and all remedial actions are complete for FTMM-54 *south of the FTMM-18 boundary only*, as depicted on Figure 1.3 of the referenced report. That area of FTMM-54 located north of the FTMM-18 boundary remains an area of concern for both soil and ground water and is specifically excluded from this approval. The determination that the remedial action is complete is based upon information in the Department's case file, the report submitted by the Department of the Army, and the certified representations and information provided to the Department.

If you have any questions regarding this matter contact Linda Range at (609)984-6606.

Sincerely,

Gwen B. Zervas, P.E.
Section Chief

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



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.

Documents:

- "Letter Work Plan Addendum for the FTMM-54 Area at FTMM-18, Fort Monmouth, New Jersey" (June 2016)

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



DEPARTMENT OF THE ARMY

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

June 28, 2016

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

**SUBJECT: Letter Work Plan Addendum for the FTMM-54 Area at FTMM-18,
Fort Monmouth, New Jersey**

Dear Ms. Range:

The purpose of this Work Plan Addendum is to describe the supplemental environmental investigation of a portion of Installation Restoration Program (IRP) Site FTMM-54 (Building 296 Gasoline Underground Storage Tanks [USTs]) located within the general area of FTMM-18 (M18 Landfill). Additional soil sampling will be performed to supplement previous post-excavation soil sampling from the Former Fuel Distribution Piping Excavation Area (see **Figure 1**). This area was specifically excluded from unrestricted use by the New Jersey Department of Environmental Protection (NJDEP) in their No Further Action (NFA) approval letter for FTMM-54 dated May 4, 2016, pending additional soil characterization.

FTMM-54 was a former fuel distribution facility with 12 gasoline and diesel USTs located near Building 296, and associated fuel distribution piping extending northward to the western portion of the FTMM-18 landfill. During the removal of USTs and associated below-ground piping in 1993 to 1994, an unspecified volume of petroleum-contaminated soil was also excavated and removed from the Former Fuel Distribution Piping Excavation Area. Soil samples were collected from the side walls of the excavation and analyzed for volatile organic compounds (VOCs), Total Petroleum Hydrocarbons (TPH), and lead. The excavation was backfilled with gravel, and then monitor wells were installed in 1994, including well 296MW06 (**Figure 1**).

Landfill delineation test pits were excavated in the vicinity of the Former Fuel Distribution Piping Excavation Area in 2009 and 2015, and petroleum odors and elevated photoionization detector (PID) readings were noted in nearby test pits 9, 9A, and 11 (**Figure 2**). Native soil within the area was typically observed as brown, gray or black silty sand to a depth of at least 5 ft below ground surface (bgs), and groundwater was typically encountered within 2 to 3 ft bgs. Blue gravel used as backfill was present within the Former Fuel Distribution Piping Excavation Area, and was typically encountered from 1 to 4 ft bgs in test pits.

Additional soil samples within the Former Fuel Distribution Piping Excavation Area will be collected to supplement the previous perimeter soil samples collected in 1994, and to better characterize soil in this area due to benzene concentrations in groundwater above the GWQS in

monitor well 296MW06. Two primary Geoprobe borings (M-54-SB-01 and M-54-SB-02) will be installed (**Figure 3**), and two soil samples will be collected from each boring below the backfill material described as "blue gravel" in test pit logs. Groundwater will not be sampled from these borings but is monitored annually for VOCs in wells 296MW04 and 296MW06.

Each Geoprobe boring will be completed to 8 ft bgs, which is estimated to extend below the water table (expected at approximately 2.5 ft bgs) and below the blue gravel backfill (expected from near the ground surface to approximately 3 to 4 ft bgs). Two soil samples will be collected from each primary boring as described below:

- A soil sample will be collected from the soil interval representative of native soil immediately underlying the blue gravel (estimated at approximately 4.0-4.5 ft bgs), or from the most contaminated soil interval encountered below the blue gravel based on field evidence (visual, petroleum odor, or PID screening).
- A second soil sample will be collected from a deeper interval that is below the sample described above, and below any field evidence of contamination, to delineate vertical extent; this sample is anticipated to be collected from 7.0 to 7.5 ft bgs.

Additional contingency Geoprobe borings will be advanced if field indications of hydrocarbon contamination (such as staining, petroleum odor or elevated PID readings) are present in either of the two primary borings (**Figure 3**). The goal of the contingency borings is to delineate the extent of petroleum contamination. If contingency borings are sampled, then two soil samples will be collected from each boring at the same depths as described above for the primary borings.

Each soil sample will be analyzed for extractable petroleum hydrocarbons (EPH), VOCs plus tentatively identified compounds (TICs) including 1,2-dibromoethane and 1,2-dichloroethane, and for lead. A minimum of 25 percent of the samples with EPH concentrations greater than 1000 mg/kg will also be analyzed for 2-methylnaphthalene and naphthalene. These soil analyses are consistent with the requirements for leaded gasoline and for diesel fuel in Table 2-1 of the NJAC 7:26E Technical Requirements for Site Remediation. A summary of the soil and groundwater sampling and analysis is presented in **Table 1**.

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

Sincerely,



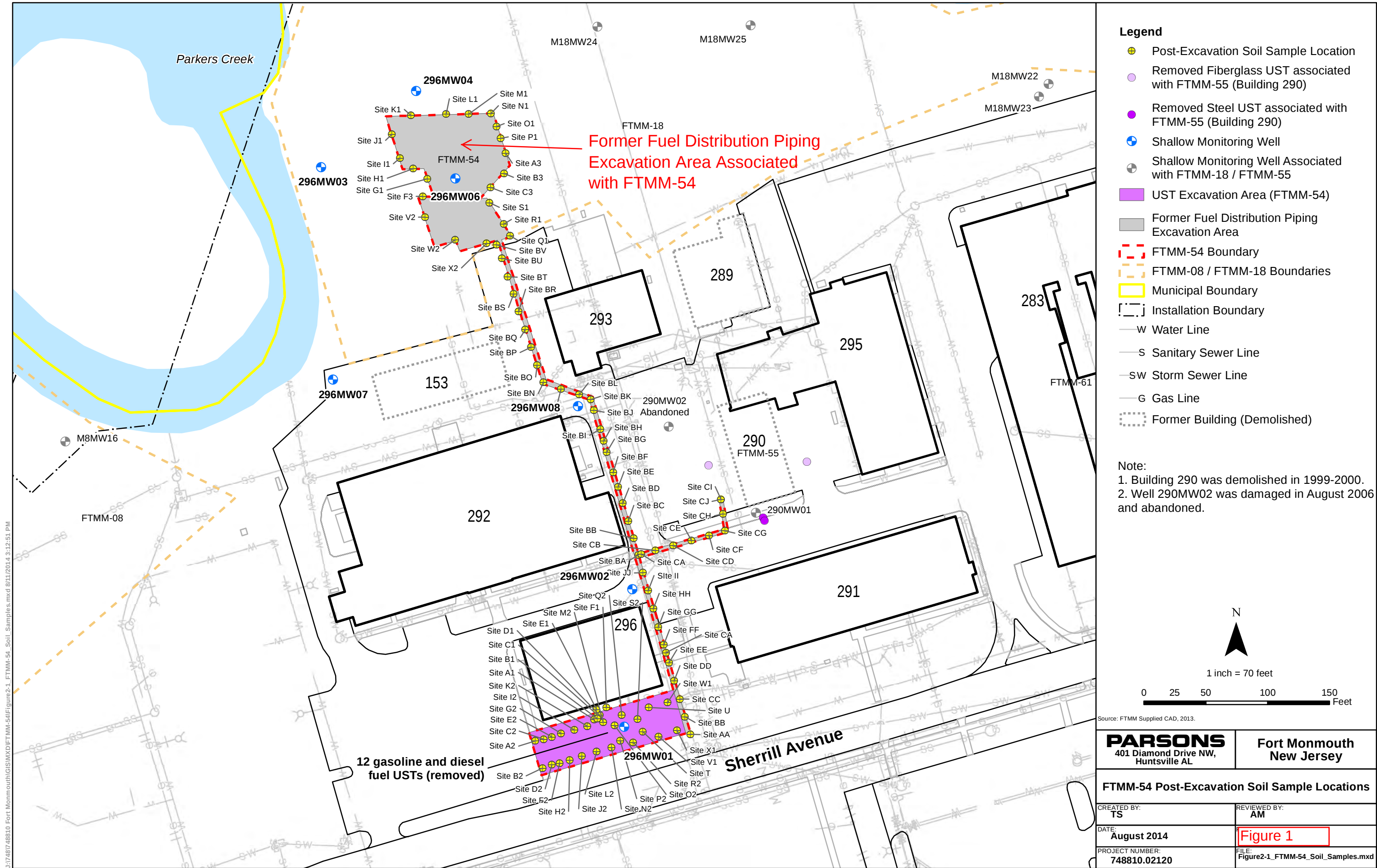
William R. Colvin, PMP, CHMM, PG
BRAC Environmental Coordinator

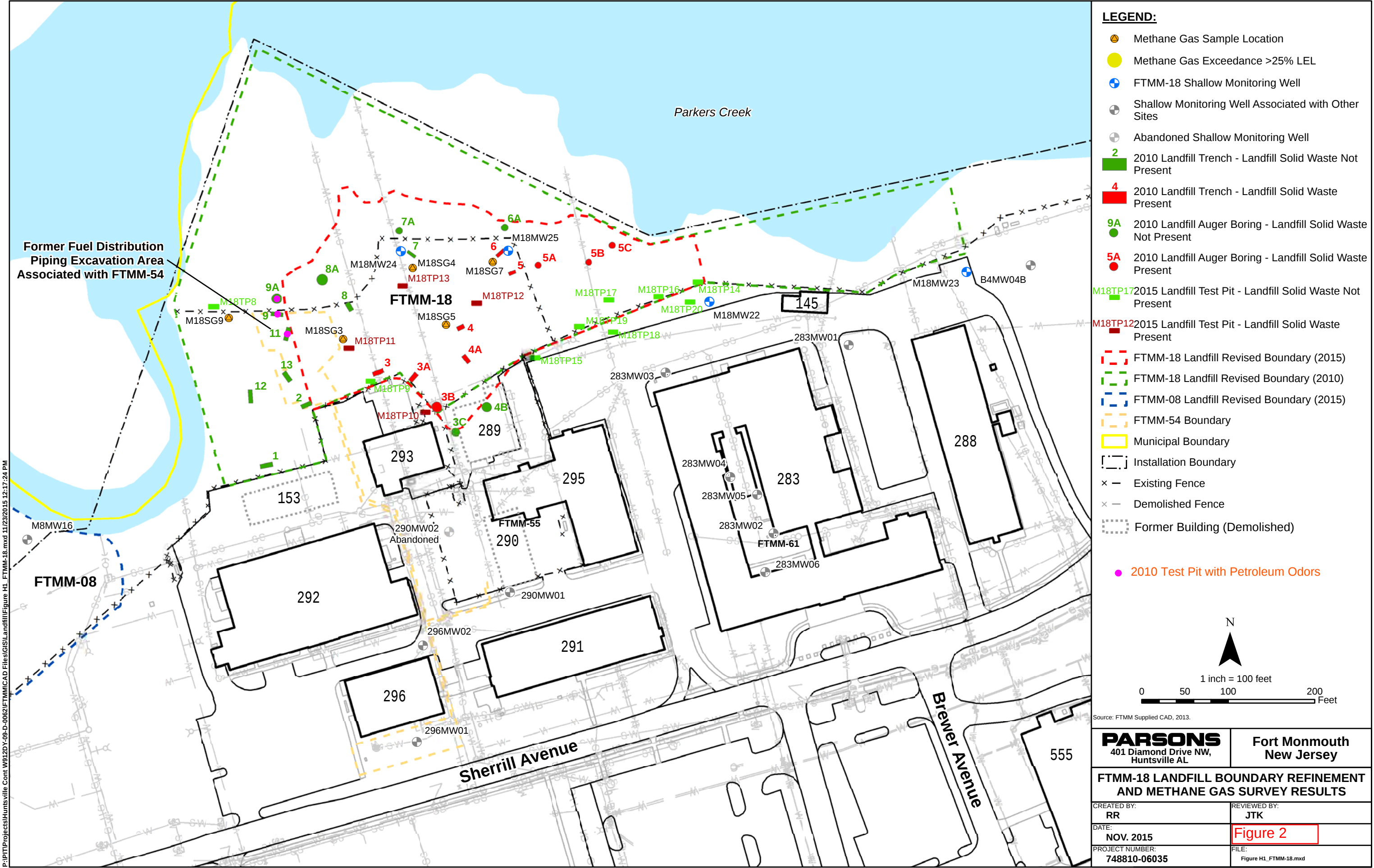
Linda S. Range, NJDEP
Letter Work Plan Addendum
FTMM-54 Area at FTMM-18
June 28, 2016
Page 3 of 3

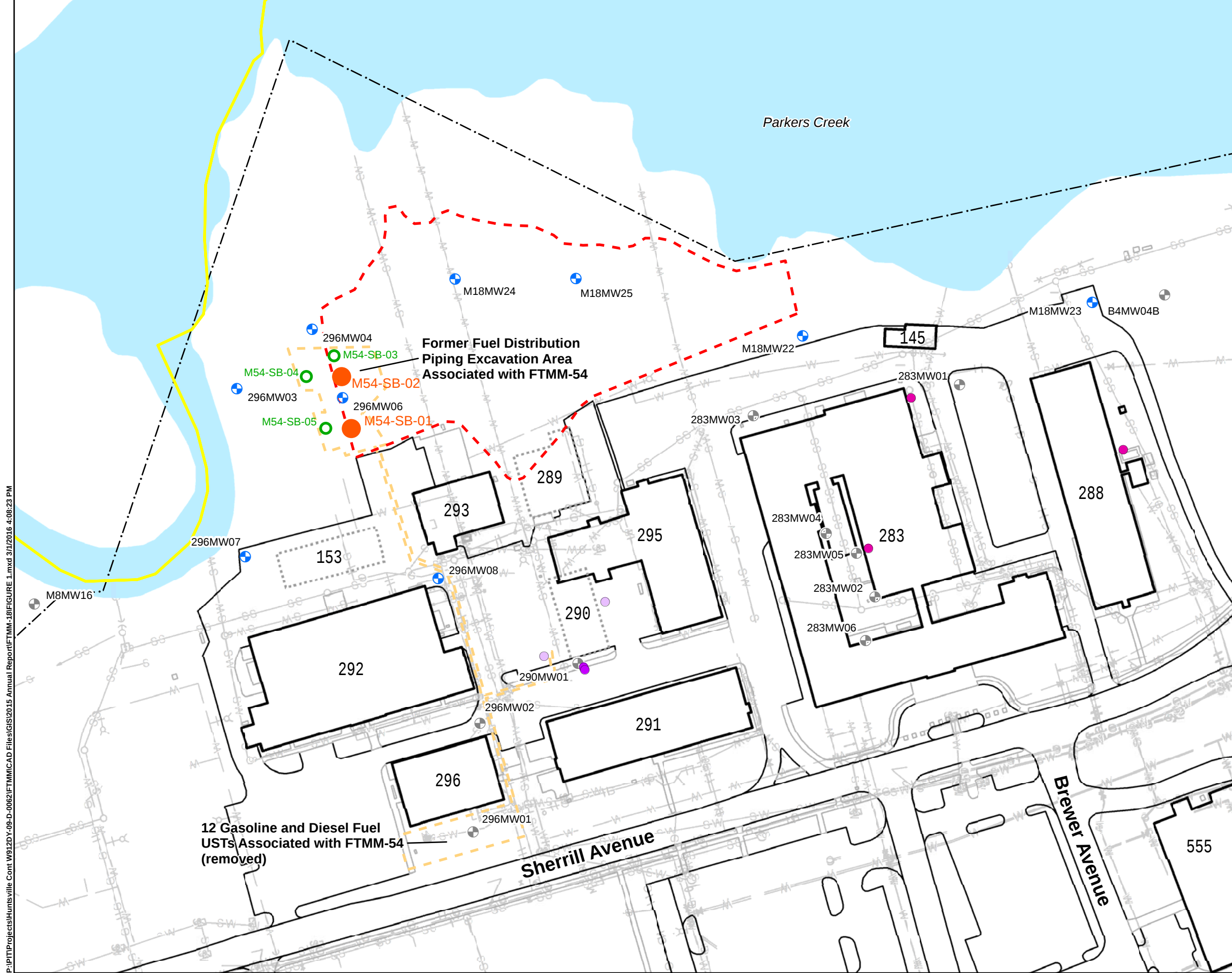
Attachments:

Figure 1 FTMM-54 Post-Excavation Soil Sample Locations
Figure 2 FTMM-18 Landfill Boundary Refinement and Methane Gas Survey Results
Figure 3 Proposed Sample Locations for FTMM-54 within the FTMM-18 Area
Table 1 Sampling Summary for FTMM-54 at FTMM-18 Work Plan Addendum

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







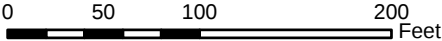
LEGEND:

- Shallow Monitoring Well
- Shallow Monitoring Well Associated with FTMM-54 / FTMM-55 / FTMM-61
- Removed Fiberglass UST associated with FTMM-55 (Building 290)
- Removed Steel UST associated with FTMM-55 (Building 290)
- Removed Steel UST associated with FTMM-61 (Building 283)
- FTMM-18 Landfill Revised Boundary (2015)
- FTMM-54 Boundary
- Municipal Boundary
- Installation Boundary
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Former Building (Demolished)
- Primary Soil Boring
- Contingency Soil Boring (see text)

DRAFT

N

1 inch = 100 feet



Source: FTMM Supplied CAD, 2013.

PARSONS
401 Diamond Drive NW,
Huntsville AL

Fort Monmouth
New Jersey

**Proposed Sample Locations for
FTMM-54 within the FTMM-18 Area**

CREATED BY:
RR

REVIEWED BY:
ME

DATE:
MAR. 2016

Figure 3

PROJECT NUMBER:
748810-01000

FILE:
FIGURE 1.mxd

TABLE 1
SAMPLING SUMMARY FOR FTMM-54 AT FTMM-18 WORK PLAN ADDENDUM
FORT MONMOUTH, NEW JERSEY

Site	Location	Field Meter Readings ^{a/}	VOCs + TICs by Method 8260C ^{b/}	Lead by Method 6010C ^{c/}	Fractionated EPH ^{d/}
Soil					
FTMM-54	Primary Borings (Figure 3): 2 soil borings, 2 samples each.	2 borings	4	4	4
FTMM-54	Contingency Borings (Figure 3): 3 soil borings, 2 samples each.	3 borings	6	6	6
QA/QC samples (see SAP for additional details) ^{e/}					
Field Duplicates (5% Sampling Frequency per media)		NA	1	1	1
Matrix Spike (5% Sampling Frequency per media)		NA	1	1	1
Matrix Spike Duplicate (5% Sampling Frequency per media)		NA	1	1	1
Trip Blank (1 per cooler of VOCs per media)		NA	1	0	0
QA Split (5% per media)		NA	1	1	1
Equipment Blank (5% Sampling Frequency per media)		NA	1	1	1
TOTAL		NA	16	15	15

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/} VOCs = volatile organic compounds; TICs = tentatively identified compounds; must include 1,2-dibromoethane and 1,2-dichloroethane.

^{c/} Metals analysis will be limited to lead.

^{d/} EPH = extractable petroleum hydrocarbons. If any EPH concentrations in soil exceed 1000 mg/kg in any of the site samples, the minimum 25% of the samples where EPH exceeds 1000 mg/kg will also be analyzed for 2-methylnaphthalene and naphthalene.

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



State of New Jersey

CHRIS CHRISTIE
Governor

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

July 7, 2016

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

Re: *Letter Work Plan Addendum for the FTMM-54 Area at FTMM-18*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced submittal, received on July 6, 2016, prepared by the Department of the Army, to perform additional post excavation soil sampling of the Former Fuel Distribution Excavation area. The Addendum is acceptable.

Please contact this office with any questions.

Sincerely,

Linda S. Range

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



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: "Response to Comments to NJDEP Comments on Final Remedial Investigation Report for FTMM-18 dated October 2015 (and Landfill Boundary Refinement for FTMM-18 only dated January 2016)"

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: 28 November, 2016

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

November 28, 2016

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

SUBJECT: *Final Remedial Investigation Report for FTMM-18 dated October 2015 (& Landfill Boundary Refinement for FTMM-18 only dated January 2016)*
Fort Monmouth, Oceanport, New Jersey
PIG000000032

Dear Ms. Range:

The Fort Monmouth (FTMM) team has reviewed the New Jersey Department of Environmental Protection (NJDEP) comments (letter dated August 9, 2016) on the subject submittals. Responses to the comments are provided below in the order in which they were presented in the comment letter.

A. Soil Analytical Results

A. COMMENT: *Elevated levels of PAHs and priority pollutant metals have been noted, however, contaminants of concern are to be addressed via engineering and institutional controls. Addressing all known levels of contamination in this manner is acceptable pending compliance with comments as noted below. If areas of obvious and/or significant contamination are encountered during the landfill preparation or capping activities, it is possible additional hot spot removal may be necessary.*

As has been previously discussed, all historically noted sample locations containing elevated levels of contamination are to be addressed via engineering and institutional controls (none may remain beyond the area undergoing capping). Figure 2-1 of the submittal displays historic boring locations relative to the 2015 revised boundary. A review of analytical data appears to confirm locations with elevated concentrations are located within the 2015 revised boundary. The cap must adequately include affected soil in the areas of B28, B34, and in particular B31, which exhibited elevated levels of PAHs while appearing to be located very close to and/or immediately adjacent to the designated southern boundary near Building 293 on Figure 2.1.

A. RESPONSE: The proposed remedy as described in the July 2015 FTMM-14 Remedial Investigation Report (RIR) remains the same, and contaminants of concern will be addressed via the NJDEP Site Remediation Program (SRP) policy since 1993 that allows for contaminants with appropriate institutional and engineering controls to be non-permanently remediated as long as the remedy is found to be protective of human health and the environment.

Institutional controls (i.e. deed notice) will be implemented at FTMM-18 as soil concentrations are above their respective NJDEP residential direct contact soil remediation standards (RDCSRS). Engineering controls (i.e. a cap) will also be implemented at FTMM-18 to address safety concerns and to protect non-residents from future exposure to solid waste at the landfill. A secondary benefit of the cap will be to prevent future exposure of soil concentrations above their respective NJDEP non-residential direct contact soil remediation standards (NRDCSRS). The applicable controls will be applied based on the level of contamination.

Soil borings, B28, B34, and B31 had benzo(a)pyrene concentrations greater than the residential and non-residential DRSSRS (200 mg/kg for both) in surface samples from 0 to 12 inches bgs. These soil borings locations will be addressed by the institutional and engineering controls previously described. Due to the location of the soil borings that contain PAH concentrations above the NRDCSRS being within the proposed landfill boundaries, there are no proposed changes to the landfill boundaries at FTMM-18.

B. Landfill Boundary

B. COMMENT: *Based upon reviews of the historic aerials, historic sampling locations and analytical findings, as well as test pit and boring locations and findings, the boundary as noted in Figure H1 of the January 2016 Landfill Boundary Refinement and Methane Gas Survey Report for Nine Landfills appears to adequately encompass the extent of known contamination and landfilled material at FTMM-18, with the following exceptions.*

Although located within the 2015 Revised Boundary of the landfill, Figure H1 of the Landfill Boundary Refinement submittal represents boring and test pit locations 6A, 7, 7A, 8 and 8A as "solid waste not present". The logs for those test pits and borings, however, found in Appendix A1 Appendix A of the RIR, indicate landfill material was present (concrete and asphalt were encountered from 1-2' at location 6A; concrete, asphalt and scrap metal from 2-4' at location 7).

M18TP10, based upon the test pit field log found in the Landfill Boundary Refinement submittal which references waste material including ash, coal and asphalt from 1-4', is shown on Figure H1 of the Landfill Boundary Refinement submittal as lying beyond the landfill boundary. Please explain why the boundary should not be expanded to include this area.

Two issues are noted with test pit M18TP14. The field log for test pit M18TP14 (and M28TP16 as well) indicates "no waste", however, the log references minimum or surface debris including glass and plastic bottles, and lumber. As has been discussed, the Department does not agree "minimum debris" exempts an area from consideration as landfill. M18TP14 and M18TP16 are

(marginally) located within the boundary as noted in Figure H1, however, any such debris located beyond the noted "boundary " must also be addressed either via extension of the engineering controls (cap) to those areas, or by incorporating the material into that area to be capped (e.g moving the material back into that area to be capped). Additionally, the log for M18TP14 includes a location sketch which appears to indicate MW25 is in the immediate area, rather than M1 8MW22. Please clarify.

B. RESPONSE: FTMM disagrees with NJDEP on their assessment of M18TP10, M18TP14, and M18TP16 and maintains that debris of a scattered nature and or *de minimus* quantity does not constitute a landfill. The solid waste regulations (N.J.A.C. 7:26-1.4) define a landfill as a solid waste facility or sanitary landfill, at which solid waste is deposited on or into the land as fill for the purpose of permanent disposal or storage for a period of time exceeding six months. As the contents of the test pits demonstrate, FTMM-18 contains primarily construction and demolition debris and does not constitute a landfill under the solid waste regulations definition. It is generally recognized that scattered debris may exist outside the limits of a consolidated landfill as such we made a judgment for FTMM-18 on a case-by-case basis that some debris (of a scattered nature and *de minimus*) in selected test pits did not constitute a landfill, which we believe is reasonable and appropriate given the wide variety of activities at FTMM over many decades. However, we believe the steps outlined below represent a reasonable compromise to achieve the project goals.

Figure H1 of the January 2016 Landfill Boundary Refinement Report has been revised to change borings 6A, 7, 7A, 8 and 8A from green indicating that "landfill solid waste not present" to red indicating that "landfill solid waste present". As these borings are within the October 2015 RIR, no revisions will be made to the landfill boundary.

At M18TP10, relocation of the debris material to within the landfill boundary is proposed to include this material under the proposed engineering control landfill cap.

The surface debris described in test pits M18TP14 and M18TP16 was observed at the ground surface and not within the actual test pits. During landfill cap construction, surface debris will be removed and placed under the landfill cover. Since no debris was observed at these two test pit locations below the ground surface, test pits M18TP14 and M18TP16 are correctly described as containing "no waste." The landfill boundary will not be revised in this area.

The log for M18TP14 incorrectly references M18MW22 as MW25, however, the rest of the location sketch correctly depicts the location of M18TP14 in relation to other site features. The corrected test pit log is attached. The location of M18TP14 is correctly depicted on the test pit log for M18TP16; on that test pit log location sketch, M18TP14 is shown 47.5 feet east of M18TP16.

C. Proposed Remedy

C. COMMENT: *The landfill is to be cleared, regraded, and covered with a vegetated two foot cap of clean soil. A vegetated soil cover of two feet of clean fill, and the implementation of a LUC through the filing of a deed notice with its incumbent inspection and reporting requirements, was previously deemed appropriate and is acceptable.*

It is anticipated a CEA will be established, to remain in place until NJDEP Ground Water Quality Standards are achieved at FTMM-18. The use of the term "residential" user, within the submittal's discussion as to the intent of a CEA, however, is not accurate. As you are aware, CEAs are established in order to provide notice that the constituent standards for a given aquifer classification are not or will not be met in a localized area due to natural water quality or anthropogenic influences, and that designated aquifer uses are suspended in the affected area for the term of the CEA. The Department shall restrict or require the restriction of potable ground water uses within any Classification Exception Area where there is or will be an exceedance of the Primary Drinking Water Quality Standards. The intent of such Departmental action is to ensure that the uses of the aquifer are restricted until standards are achieved

C. RESPONSE: FTMM concurs with the proposed remedy a of a vegetated soil cap for FTMM-18 as stated by NJDEP in comment C. The Army agrees with the NJDEP clarification of and the intent of a CEA. As discussed on our November 15, 2016 conference call, the selected remedy for groundwater is monitored natural attenuation (MNA) since groundwater concentrations at FTMM-18 are above the NJDEP Groundwater Quality Standards (GWQS) and Institutional Controls in the form of a CEA a will be implemented and remain in place until NJDEP GWQS are achieved at the site.

D. Miscellaneous

D. COMMENT: *As previously discussed with the Army, the Department did not approve the site-wide background soil or ground water quality investigations referenced in the submittal, e.g. the Weston 1995 Background Investigation or 2011 Brinkerhoff Background Metals Evaluation.*

D. RESPONSE: FTMM acknowledges that the site-wide background soil and ground water quality investigations referenced in the submittal have not been approved by NJDEP.

We look forward to your review of these responses and approval of the FTMM-18 RIR and the FTMM-18 portion of the *Landfill Boundary Refinement and Methane Gas Survey Report for Nine Landfills*. Should you have any questions or require additional information, please contact me by phone at (732) 380-7064 or by email at william.r.colvin18.civ@mail.mil.

Sincerely,

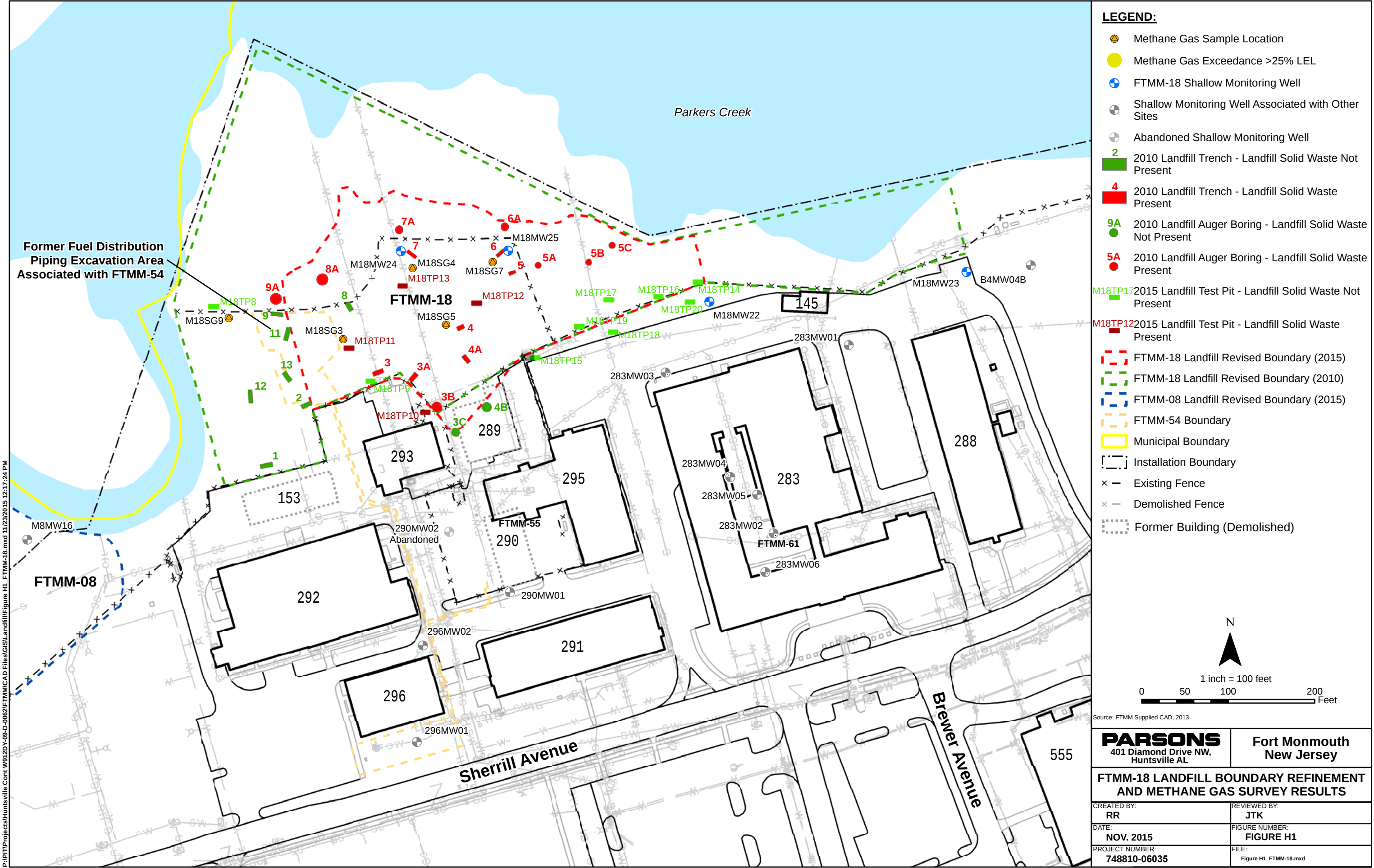


William R. Colvin, PMP, PG, CHMM
BRAC Environmental Coordinator

Attachments – Figure H1 - FTMM-18 Landfill Boundary Refinement and Methane Gas Survey Results

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

Figure H1 - FTMM-18 Landfill Boundary Refinement and Methane Gas Survey Results





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: "December 2016 Letter Work Plan Addendum for the FTMM-54 Area at FTMM-18"

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: 12/28/2016

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

December 28, 2016

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

**SUBJECT: December 2016 Letter Work Plan Addendum for the FTMM-54 Area at
FTMM-18, Fort Monmouth, New Jersey**

Dear Ms. Range:

The purpose of this December 2016 Letter Work Plan Addendum (LWPA) is to address naphthalene exceedances encountered during the August 2016 sampling event at the subject area. This December 2016 LWPA proposes one additional boring to augment previous environmental investigations conducted at the FTMM-54 Area located within FTMM-18. The NJDEP agreed (letter dated May 4, 2016) that the rest of FTMM-54 located south of FTMM-18 required no additional actions and approved unrestricted use. Therefore all further work at FTMM-54 has been focused on the area within FTMM-18.

Work performed under the previous LWPA for the FTMM-54 Area at FTMM-18, submitted to the NJDEP on June 28, 2016, included the collection and analysis of soil samples from five soil borings for volatile organic compounds (VOCs) plus tentatively identified compounds (VOC+TICs), EPH, and lead analyses as shown on **Figure 1**. Soil samples were collected on August 8, 2016 as described in the June 2016 LWPA. Based on the results (see **Table 1**), the only exceedance of the New Jersey Department of Environmental Protection (NJDEP) Residential Direct Contact Soil Remediation Standard (RDSCRS) was naphthalene at 6-6.5 ft below ground surface (bgs) in M54-SB-02. There were no exceedances of the Non-Residential Direct Contact Soil Remediation Standard (NRDCRS). Although benzene was detected at concentrations exceeding the impact to groundwater soil remediation standard (IGWSRS) at approximately 6 to 7 ft bgs in M54-SB-02 and M54-SB-03, these samples were collected below the water table, and the IGWSRS does not apply below the water table. As agreed by the NJDEP in their February 4, 2015 letter, groundwater contamination associated with FTMM-54 will be addressed under the FTMM-18 RI/FS and has been monitored and reported through the Annual Groundwater Reports at FTMM-18. The remedy for FTMM-18 is presumed to be monitored natural attenuation (MNA). A Classification Exception Area (CEA) will be filed with the state which will include benzene. Also, benzene was previously delineated in soil around the perimeter of the Former Fuel Distribution Piping Excavation Area in sampling conducted in 1994. Previous sampling did not

include naphthalene as a VOC analyte. Therefore, the only compound of potential concern for additional delineation is naphthalene. Boring logs are provided in **Attachment A**, and sample results are provided in **Table 1**.

Based on the sampling results, further delineation of the naphthalene exceedance is proposed to the east of Boring M54-SB-02. One additional Boring M54-SB-06 will be installed east of M54-SB-02 to determine the horizontal extent of the naphthalene exceedance. An additional contingency boring, M54-SB-07 will be installed to the east of M54-SB-06, with samples collected to be extracted and held by the laboratory for contingency analysis. The proposed sample locations are shown on **Figure 2**, and the quantity of samples are summarized on **Table 2**. The samples will be collected and analyzed for naphthalene based on the same criteria used in the June 28, 2016 LWPA, as follows:

- A soil sample will be collected from the soil interval representative of native soil immediately underlying the blue gravel (estimated at approximately 4.0-6 ft bgs), or from the most contaminated soil interval encountered below the blue gravel based on field evidence (visual, petroleum odor, or PID screening).
- A second soil sample will be collected from a deeper interval that is below the sample described above, and below any field evidence of contamination, to delineate vertical extent; this sample is anticipated to be collected from 7.0 to 7.5 ft bgs.
- If no field evidence of contamination or no blue gravel is present, then samples will be collected from 6.0 to 6.5 ft bgs and 11.0 to 11.5 ft bgs, which corresponds to the sample intervals of previous boring M54-SB-02.

We look forward to your review of this proposed sampling plan, and approval or additional comments. The technical Point of Contact (POC) for this matter is Cris Grill at (617) 449-1583 or by email at cris.grill@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

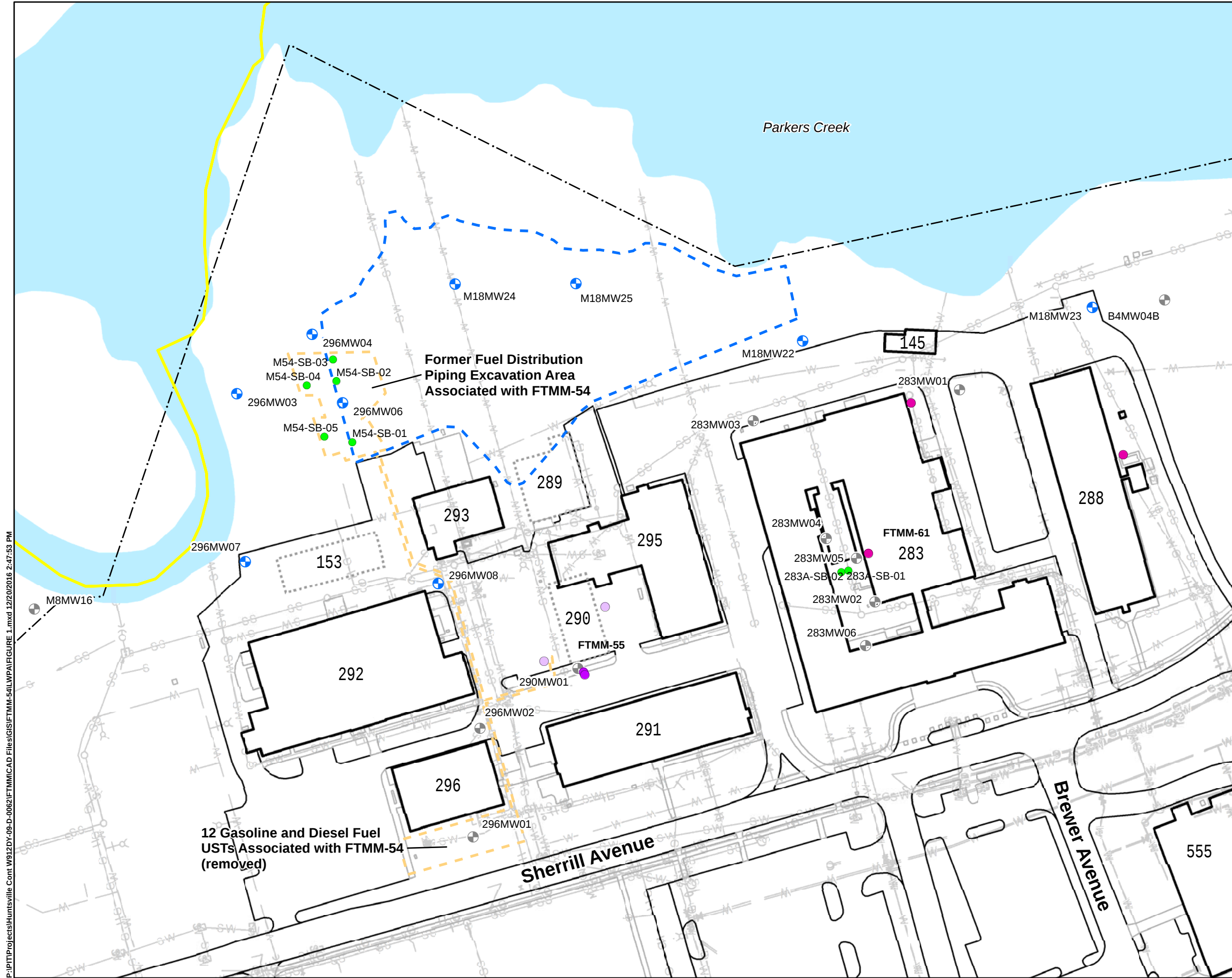
Attachments:

Figure 1 Sample Locations for FTMM-54 within the FTMM-18 Area
Figure 2 Proposed Sample Locations for FTMM-54 within the FTMM-18 Area
Table 1 Detected Soil Sampling Results – Comparison to NJDEP Standards
Table 2 Sampling Summary for FTMM-54 Revised Letter Work Plan Addendum
Attachment A Boring Logs

Linda S. Range, NJDEP
December Letter Work Plan Addendum
FTMM-54 Area at FTMM-18
December 28, 2016
Page 3 of 3

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

Figure 1
Sample Locations for FTMM-54 within the FTMM-18 Area



LEGEND:

- Shallow Monitoring Well
- Shallow Monitoring Well Associated with FTMM-54 / FTMM-55 / FTMM-61
- Previous 2016 Boring
- Removed Fiberglass UST associated with FTMM-55 (Building 290)
- Removed Steel UST associated with FTMM-55 (Building 290)
- Removed Steel UST associated with FTMM-61 (Building 283)
- FTMM-18 Landfill Revised Boundary (2015)
- FTMM-08 Boundary
- FTMM-54 Boundary
- Municipal Boundary
- Installation Boundary
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Former Building (Demolished)

DRAFT
N
1 inch = 100 feet
0 50 100 200 Feet

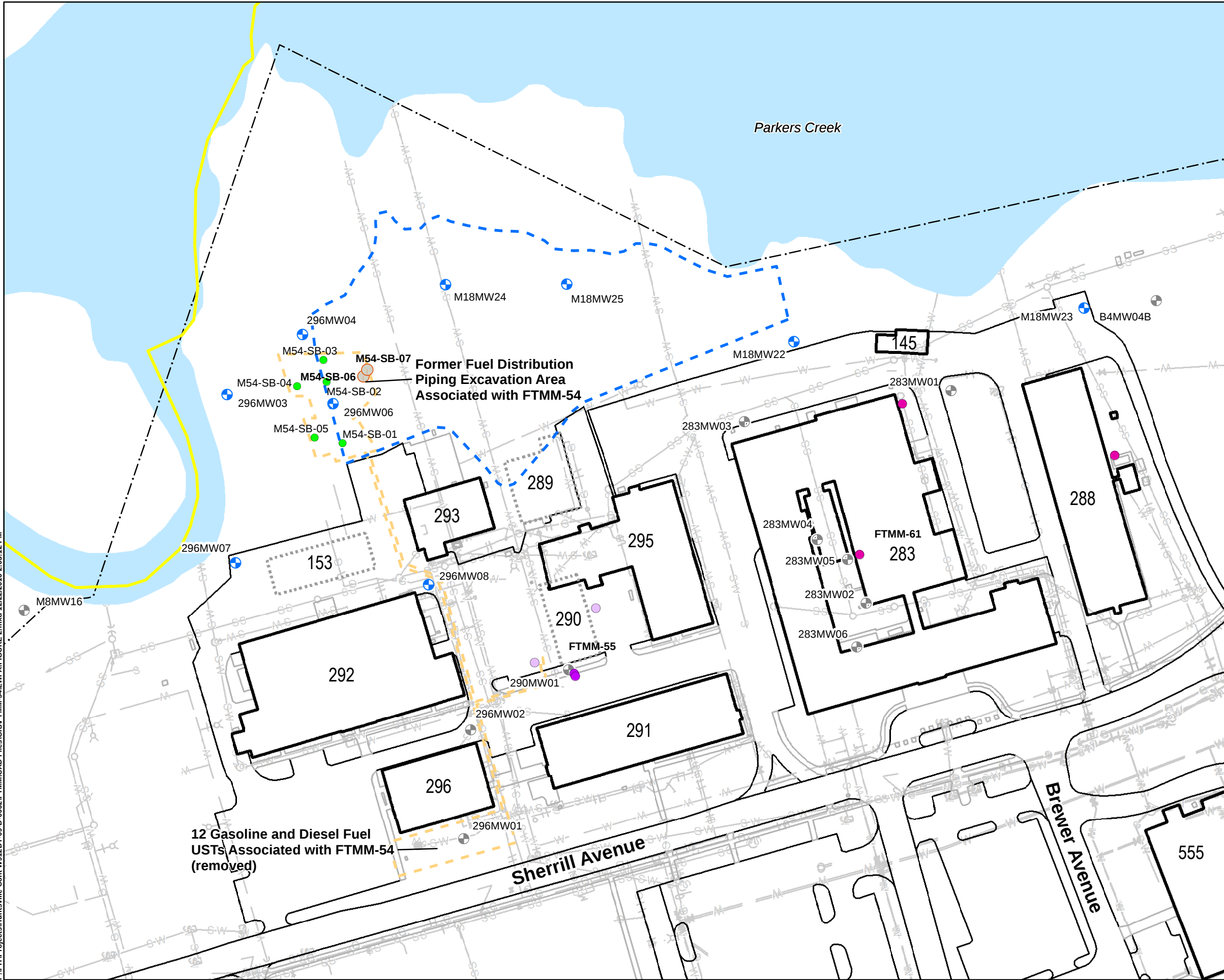
Source: FTMM Supplied CAD, 2013.

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
SAMPLE LOCATIONS FOR FTMM-54 WITHIN THE FTMM-18 AREA	
CREATED BY: RR	REVIEWED BY: RF
DATE: DEC. 2016	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-02120	FILE: FIGURE 1.mxd

P:\PTT\Projects\Huntsville Cont W912\DY-09-D-0062\FTMMCAD Files\GIS\FTMM-54\WP\FIGURE 1.mxd 12/20/2016 2:47:53 PM

Figure 2
Proposed Sample Locations for FTMM-54 within the FTMM-18 Area

P:\PTT\Projects\Huntsville Cont W912.DY-09-D-0062\FTMM-54\WPA\FIGURE 2.mxd 12/22/2016 2:03:12 PM



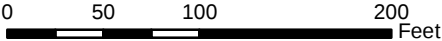
LEGEND:

- Proposed Soil Boring
- Previous 2016 Boring
- Shallow Monitoring Well
- Shallow Monitoring Well Associated with FTMM-54 / FTMM-55 / FTMM-61
- Removed Fiberglass UST associated with FTMM-55 (Building 290)
- Removed Steel UST associated with FTMM-55 (Building 290)
- Removed Steel UST associated with FTMM-61 (Building 283)
- FTMM-18 Landfill Boundary
- FTMM-08 Boundary
- FTMM-54 Boundary
- Municipal Boundary
- Installation Boundary
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Former Building (Demolished)

DRAFT

N

1 inch = 100 feet



Source: FTMM Supplied CAD, 2013.

PARSONS
401 Diamond Drive NW,
Huntsville AL

Fort Monmouth
New Jersey

**PROPOSED SAMPLE LOCATIONS FOR
FTMM-54 WITHIN THE FTMM-18 AREA**

CREATED BY: RR	REVIEWED BY: RF
DATE: DEC. 2016	FIGURE NUMBER: FIGURE 2
PROJECT NUMBER: 748810-02120	FILE: FIGURE 2.mxd

Table 1
Detected Soil Sampling Results – Comparison to NJDEP Standards

TABLE 1
DETECTED SOIL SAMPLING RESULTS - COMPARISON TO NJDEP STANDARDS
FTMM-54 Bldg. 296
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non- Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	M54-SB-01			M54-SB-02		M54-SB-03		M54-SB-04	
Sample ID				M54-SB-01-3.0-3.5	M54-SB-01-3.5-4.0	M54-SB-101-3.5-4.0	M54-SB-02-11.0-11.5	M54-SB-02-6.0-6.5	M54-SB-03-13-13.5	M54-SB-03-6.5-7	M54-SB-04-2.5-3	M54-SB-04-4.5-5
Sample Date				8/8/2016	8/8/2016	8/8/2016	8/8/2016	8/8/2016	8/8/2016	8/8/2016	8/8/2016	8/8/2016
Volatile Organic Compounds (mg/kg)												
1,2,4-Trimethylbenzene	NLE	NLE	NLE	< 0.0005	< 0.0005	< 0.0006	< 0.0005	0.076 J	< 0.0005	0.023	< 0.0005	< 0.0005
1,3,5-Trimethylbenzene	NLE	NLE	NLE	< 0.0005	< 0.0005	< 0.0006	< 0.0005	0.021 J	< 0.0005	0.0073	< 0.0005	< 0.0005
4-Bromofluorobenzene	NLE	NLE	NLE	0.024	0.024	0.029	0.028	1.1	0.03	0.045	0.027	0.025
Acetone	70,000	NLE	19	0.091	0.028 J	0.072 J	0.084	0.44 J	0.091	0.26	0.085	0.096
Benzene	2	5	0.005	< 0.0005	< 0.0005	< 0.0006	< 0.0005	0.021 J	< 0.0005	0.022	< 0.0005	< 0.0005
Cymene	NLE	NLE	NLE	< 0.0005	< 0.0005	< 0.0006	< 0.0005	0.0079 J	< 0.0005	0.0019 J	< 0.0005	< 0.0005
Dibromofluoromethane	NLE	NLE	NLE	0.023	0.023	0.025	0.024	1.1	0.024	0.037	0.024	0.021
Ethyl benzene	7,800	110,000	13	< 0.0005	< 0.0005	< 0.0006	< 0.0005	0.026 J	< 0.0005	0.0046	< 0.0005	< 0.0005
Isopropylbenzene	NLE	NLE	NLE	< 0.0005	< 0.0005	< 0.0006	< 0.0005	0.018 J	< 0.0005	0.016	< 0.0005	< 0.0005
Meta/Para Xylene	NLE	170,000	NLE	< 0.0005	< 0.0005	< 0.0006	< 0.0005	0.026 J	< 0.0005	0.0099	< 0.0005	< 0.0005
Methyl ethyl ketone	3,100	44,000	0.9	0.0064 J	< 0.0026	< 0.0029	0.014	0.09 J	0.0056 J	0.058	0.009 J	0.008 J
Methyl Tertbutyl Ether	110	320	0.2	0.002	< 0.0005	< 0.0006	< 0.0005	< 0.0006 UJ	< 0.0005	0.0017 J	< 0.0005	< 0.0005
Methylene chloride	34	97	0.01	0.0089 J	< 0.0006	< 0.0007	< 0.0006	0.0029 J	< 0.0006	0.0028 J	< 0.0006	< 0.0005
Naphthalene	6	17	25	0.0008 J	0.0011 J	0.001 J	0.0014 J	14.1 J	< 0.0005	0.031	0.0007 J	0.0005 J
Ortho Xylene	NLE	170,000	NLE	< 0.0005	< 0.0005	< 0.0006	< 0.0005	0.025 J	< 0.0005	0.007	< 0.0005	< 0.0005
Propylbenzene	NLE	NLE	NLE	< 0.0005	< 0.0005	< 0.0006	< 0.0005	0.0061 J	< 0.0005	0.0078	< 0.0005	< 0.0005
sec-Butylbenzene	NLE	NLE	NLE	< 0.0005	< 0.0005	< 0.0006	< 0.0005	0.0013 J	< 0.0005	0.0021 J	< 0.0005	< 0.0005
Toluene	6,300	91,000	7	0.0049	0.0025	0.0059	0.0018 J	0.0038 J	0.0031	0.0033 J	0.0037	0.0045
Trichlorofluoromethane	23,000	340,000	34	0.0029	< 0.0005	< 0.0006	< 0.0005	< 0.0006 UJ	< 0.0005	< 0.0009	< 0.0005	< 0.0005
TIC VOCs (mg/kg)												
Total TIC VOCs				0.056 JN	ND	0.02 JN	ND	0.327 JN	0.027 JN	0.4946 JN	0.034 JN	0.037 JN
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)												
C10-C12 Aromatics	NLE	NLE	NLE	1.2 J	1 J	0.91 J	< 0.54	52.8	0.81 J	3.3	0.81 J	0.82 J
C12-C16 Aliphatics	NLE	NLE	NLE	< 0.51 UJ	< 0.55	< 0.55	< 0.52 UJ	2.4 J	< 0.49 UJ	2.1 J	1.1 J	< 0.51 UJ
C12-C16 Aromatics	NLE	NLE	NLE	0.45 J	0.33 J	0.26 J	0.31 J	68.2	0.29 J	6.2	0.36 J	0.26 J
C16-C21 Aliphatics	NLE	NLE	NLE	< 0.49 UJ	< 0.54 UJ	< 0.54 UJ	< 0.51 UJ	1.2 J	< 0.48 UJ	1.9 J	1.3 J	< 0.49 UJ
C16-C21 Aromatics	NLE	NLE	NLE	1.2	1.3 J	1.3 J	1.3	227	1.2	20.8	1.7	1.1 J
C21-C36 Aromatics	NLE	NLE	NLE	0.78 J	0.74 J	0.84 J	0.83 J	235	0.55 J	34.7	1.4	0.53 J
C21-C40 Aliphatics	NLE	NLE	NLE	2.1 J	2.4	3.6	2.1 J	14.2 J	2.7 J	8.5 J	2.1 J	1.2 J
C9-C12 Aliphatics	NLE	NLE	NLE	0.38 J	0.4 J	0.44 J	0.38 J	1 J	0.49 J	1.4 J	0.66 J	0.3 J
Total Aliphatics	NLE	NLE	NLE	2.9 J	3.5 J	4.9 J	3 J	18.8 J	3.9 J	13.9 J	5.2 J	2.1 J
Total Aromatics	NLE	NLE	NLE	3.6 J	3.4 J	3.3 J	2.4 J	583	2.8 J	65	4.2 J	2.7 J
Total EPH	5100	54000	NLE	6.5 J	6.9 J	8.2 J	5.3 J	602	6.8 J	78.9	9.4 J	4.9 J
Inorganics (mg/kg)												
Lead	400	800	90	6.7	7.3	7.6	2.7	15.2	3.5	39.7	4.4	3.7

Footnote:
NLE = no limit established.
Chemical detections are bolded.

For EPH, the Protocol For Addressing Extractable Petroleum Hydrocarbons, (Version 5.0, August 9, 2010) was used to determine the applicable standards. Based on the protocol FTMM-54 EPH results are considered category 1, and Category 1 screening criteria are used.
J = estimated detected value due to a concetration 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.
JN = Tentatively identified compound, estimated concentration.

Cell Shade values represent a result that is above the NJ Residential or 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.
The NJ Residential and Non-Residential Direct Contact Soil Remediation Standards refer to the NJDEP's May 7, 2012 Remediation Standards, http://www.nj.gov/dep/rules/rules/njac7_26d.pdf

TABLE 1 DETECTED SOIL SAMPLING RESULTS - COMPARISON TO NJDEP STANDARDS FTMM-54 Bldg. 296 FORT MONMOUTH, NEW JERSEY					
Loc ID	NJ Residential Direct Contact SRS	NJ Non- Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	M54-SB-05	
Sample ID				M54-SB-05-3-3.5	M54-SB-05-5.0-5.5
Sample Date				8/8/2016	8/8/2016
Volatile Organic Compounds (mg/kg)					
1,2,4-Trimethylbenzene	NLE	NLE	NLE	< 0.0006	0.0007 J
1,3,5-Trimethylbenzene	NLE	NLE	NLE	< 0.0006	< 0.0005
4-Bromofluorobenzene	NLE	NLE	NLE	0.032	0.027
Acetone	70,000	NLE	19	0.087	0.038
Benzene	2	5	0.005	< 0.0006	< 0.0005
Cymene	NLE	NLE	NLE	< 0.0006	< 0.0005
Dibromofluoromethane	NLE	NLE	NLE	0.029	0.022
Ethyl benzene	7,800	110,000	13	< 0.0006	< 0.0005
Isopropylbenzene	NLE	NLE	NLE	< 0.0006	< 0.0005
Meta/Para Xylene	NLE	170,000	NLE	< 0.0006	< 0.0005
Methyl ethyl ketone	3,100	44,000	0.9	< 0.0028	0.0032 J
Methyl Tertbutyl Ether	110	320	0.2	< 0.0006	< 0.0005
Methylene chloride	34	97	0.01	0.0011 J	7.5 J
Naphthalene	6	17	25	< 0.0006	0.0038
Ortho Xylene	NLE	170,000	NLE	< 0.0006	< 0.0005
Propylbenzene	NLE	NLE	NLE	< 0.0006	< 0.0005
sec-Butylbenzene	NLE	NLE	NLE	< 0.0006	< 0.0005
Toluene	6,300	91,000	7	0.0082	0.0073
Trichlorofluoromethane	23,000	340,000	34	< 0.0006	< 0.0005
TIC VOCs (mg/kg)					
Total TIC VOCs				0.0274 JN	0.0164 JN
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)					
C10-C12 Aromatics	NLE	NLE	NLE	0.71 J	1.1 J
C12-C16 Aliphatics	NLE	NLE	NLE	< 0.45 UJ	< 0.52 UJ
C12-C16 Aromatics	NLE	NLE	NLE	0.22 J	0.36 J
C16-C21 Aliphatics	NLE	NLE	NLE	< 0.44 UJ	< 0.51 UJ
C16-C21 Aromatics	NLE	NLE	NLE	0.99 J	1.1 J
C21-C36 Aromatics	NLE	NLE	NLE	0.35 J	0.37 J
C21-C40 Aliphatics	NLE	NLE	NLE	0.62 J	0.79 J
C9-C12 Aliphatics	NLE	NLE	NLE	0.41 J	0.46 J
Total Aliphatics	NLE	NLE	NLE	1.6 J	1.8 J
Total Aromatics	NLE	NLE	NLE	2.3 J	3 J
Total EPH	5100	54000	NLE	3.9 J	4.8 J
Inorganics (mg/kg)					
Lead	400	800	90	3.2	3.3

Footnote:
NLE = no limit established.
Chemical detections are bolded.

For EPH, the Protocol For Addressing Extractable Petroleum Hydrocarbons, (Version 5.0, August 9, 2010) was used to determine the applicable standards. Based on the protocol FTMM-54 EPH results are considered category 1, and Category 1 screening criteria are used.
J = estimated detected value due to a concetration 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.
JN = Tentatively identified compound, estimated concentration.

Cell Shade values represent a result that is above the NJ Residential or Non Residential Direct Contact Soil Remediation Standard.
Cell Shade values represent a result that is above the NJ Impact to GW Soi 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.
The NJ Residential and Non-Residential Direct Contact Soil Remediation Standards refer to the NJDEP's May 7, 2012 Remediation Standards, http://www.nj.gov/dep/rules/rules/njac7_26d.pdf

Table 2
Sampling Summary for FTMM-54 Revised Letter Work Plan Addendum

TABLE 2
SAMPLING SUMMARY FOR FTMM-54 AT FTMM-18
DECEMBER LETTER WORK PLAN ADDENDUM
FORT MONMOUTH, NEW JERSEY

Site	Location and Rationale	Field Meter Readings ^{a/}	Naphthalene by Method 8260C
Soil			
FTMM-54	Primary Boring M54-SB-06 (Figure 2): 1 soil borings, 2 samples. Collected just inside the boundary of FTMM-54, east of M54-SB-02.	1 boring	2
FTMM-54	Contingency Boring M54-SB-07 (Figure 2): 1 soil boring, 2 samples. Collected just outside the boundary of FTMM-54, approximately 5-10 feet east of M54-SB-06. To be held pending results at M54-SB-06.	1 boring	2
QA/QC samples (see SAP for additional details) ^{b/}			
Field Duplicates (5% Sampling Frequency per media)		NA	1
Matrix Spike (5% Sampling Frequency per media)		NA	1
Matrix Spike Duplicate (5% Sampling Frequency per media)		NA	1
Trip Blank (1 per cooler of VOCs per media)		NA	1
QA Split (5% per media)		NA	1
Equipment Blank (5% Sampling Frequency per media)		NA	1
TOTAL		NA	8

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

Attachment A
Boring Logs

Soil Boring Log

CLIENT: USACE PROJECT NAME: FTMM - ECP PROJECT LOCATION: FTMM Parcel PROJECT NUMBER: 748810-					INSPECTOR: <u>C. Watson</u> DRILLER: <u>J. BARNIK</u> WEATHER: <u>80°F O.C.</u> CONTRACTOR: East Coast Drilling, Inc. (ECDI)		BORING/WELL ID: <u>M54-SB-01</u> LOCATION DESCRIPTION: <u>M54</u>																
GROUNDWATER OBSERVATIONS WATER LEVEL: <u>~1.5</u> DATE: <u>8/8/16</u> TIME: _____ MEAS. FROM: _____					RIG TYPE: <u>Geoprobe® 7822DT</u> DATE/TIME START: <u>8/8/16 1215</u> DATE/TIME FINISH: <u>8/8/16 1225</u> WEIGHT OF HAMMER: <u>N/A</u> DROP OF HAMMER: <u>N/A</u> TYPE OF HAMMER: <u>N/A</u>		LOCATION PLAN: <u>Oceanport, New Jersey</u>																
DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS																
0			<u>6/48</u>	<u>0</u>	0-20" moist, brown, loose, mt SAND, trace silt, trace f gravel																		
1				<u>0</u>																			
2				<u>0</u>	20"-26" saturated, brown, loose mt, SAND, trace silt																		
3	<u>3.6-4</u> <u>3-3.5</u>			<u>3.7</u> <u>1.1</u>	26"-36" saturated, blue gravel, trace c SAND																		
4	<u>3.5-4</u>			<u>0</u>	36"-42" wet, dark gray/green/ orange mt mottled SAND, little silt																		
5			<u>60/60</u>	<u>0</u>	0-60" SAA																		
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 PROJECT NAME: FTMM - ECP PROJECT LOCATION: FTMM Parcel PROJECT NUMBER: 748810-					INSPECTOR: C. Watson DRILLER: J. BARNAK WEATHER: 80°F O.C. CONTRACTOR: East Coast Drilling, Inc. (ECDI)		BORING/WELL ID: 154-SB-02 LOCATION DESCRIPTION: Parcel 54 FTMM	
GROUNDWATER OBSERVATIONS WATER LEVEL: ~ 1 DATE: 8/8/16 TIME: MEAS. FROM:					RIG TYPE: Geoprobe(R) 7822DT DATE/TIME START: 1120 DATE/TIME FINISH: 1135 WEIGHT OF HAMMER: N/A DROP OF HAMMER: N/A TYPE OF HAMMER: N/A		LOCATION PLAN Oceanport, New Jersey	
DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS	
0			60/46	0	0-13" moist, Brown, M. Dense, MF SAND, little silt, trace f gravel			
1				0				
2				1.1	13"-23" saturated, Brown, M. Dense, MF SAND trace f gravel			
3				12.2				
4				54.8	23"-29" saturated, Brown, MC, SAND, some f gravel			
5				59.7				
6				NR	29"-46" saturated blue gravel			
7				NR				
8				48/42	6-12" SAA			
9				27.3	12"-26" Wet, blue Dark Brown f SAND and organics (wood fibers, roots), trace blue gravel			
10	6-6.5			42.9	20"-42" Wet organic material (wood fibers/roots), some silt, some f SAND			
11				6.8				
12				15.4				
13				2.1				
14				8.7				
15				NR				
16								
17								
18								
19								
20								
21								
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98								
99								
100								

Remarks:

Sample Types

S - Split-Spoon
 U - Undisturbed Tube
 C - Rock Core
 A - Auger Cuttings

Consistency vs. Blowcount / Foot

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: <u>USACE</u> PROJECT NAME: <u>FTMM - ECP</u> PROJECT LOCATION: <u>FTMM Parcel</u> PROJECT NUMBER: <u>748810-</u> GROUNDWATER OBSERVATIONS WATER LEVEL: _____ DATE: _____ TIME: _____ MEAS. FROM: _____					INSPECTOR: <u>C. Winton</u> DRILLER: <u>J. BARNIX</u> WEATHER: <u>78°F O.C.</u> CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u> RIG TYPE: <u>Geoprobe(R) 7822DT</u> DATE/TIME START: _____ DATE/TIME FINISH: _____ 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>M54-SB-02</u> LOCATION DESCRIPTION: _____ LOCATION PLAN: _____ Oceanport, New Jersey																
DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS																
<u>08</u>			<u>69/50</u>	<u>6.8</u>	<u>0-32" SAA</u>																		
				<u>14.2</u>																			
<u>09</u>				<u>6.1</u>	<u>32"-46" Wet, green, mf, soft SAND, some silt</u>																		
				<u>5.4</u>																			
<u>10</u>				<u>10.2</u>	<u>46"-52" Wet, green and orange mf, m. dense SAND, little silt</u>																		
				<u>0.4</u>																			
<u>11</u>	<u>11-11.5</u>			<u>0</u>																			
				<u>0</u>																			
<u>12</u>				<u>NR</u>																			
				<u>NR</u>																			
<u>13</u>																							
<u>6</u>																							
<u>7</u>																							
<u>8</u>																							
<u>9</u>																							
<u>0</u>																							
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;"> <tr> <th colspan="2">Granular (Sand & Gravel)</th> <th colspan="2">Fine Grained (Silts & 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 (Silts & 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 (Silts & 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																				
sand - 35-50% silt - 20-35% clay - 10-20% trace - <10% moisture, density, color, gradation																							

Soil Boring Log

CLIENT: USACE					INSPECTOR: C. WATSON		BORING/WELL ID: M54-SB-04	
PROJECT NAME: FTMM - ECP					DRILLER: J. BARNAK		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER: 80°F		Permit 54	
PROJECT NUMBER: 748810-					CONTRACTOR: East Coast Drilling, Inc. (ECDI)			
GROUNDWATER OBSERVATIONS					RIG TYPE: Geoprobe(R) 7822DT		LOCATION PLAN	
WATER LEVEL: ~1.5					DATE/TIME START: 1330 8/8		Oceanport, New Jersey	
DATE:					DATE/TIME FINISH: 1345 8/8			
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			69/52	0	0-18" moist, Brown, M. Dense MF SAND, trace silt, trace organics, trace f gravel			
1					18"-22" Saturated, SAA			
2	2.5-3				22"-28" Saturated blue gravel			
3					28"-40" Saturated, Dark Brown/gray MC SAND, little silt			
4	4.5-5				40-52" Wet, green/brown/gray MF mottled SAND, little silt			
5		69/60		0	0-11" SAA			
6					11"-60" Wet, Dark gray, M. Dense MF SAND, trace silt, trace f organics @ 54"			
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% somo - 20-35% little - 10-20% trace - <10% moisture, density, color, gradation			

Soil Boring Log

CLIENT: USACE					INSPECTOR: C. Watson		BORING/WELL ID: M54-SB-05	
PROJECT NAME: FTMM - ECP					DRILLER: J. Burnak		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER: 80°F O.C.		M54	
PROJECT NUMBER: 748810-					CONTRACTOR: East Coast Drilling, Inc. (ECDI)			
GROUNDWATER OBSERVATIONS					RIG TYPE: Geoprobe(R) 7822DT		LOCATION PLAN	
WATER LEVEL: ~3.5					DATE/TIME START: 8/8/16 1445		Oceanport, New Jersey	
DATE:					DATE/TIME FINISH: 8/8/16 1500			
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			60/41	0	0-16" moist, loose, Brown, mf SAND, trace silt			
1					16"-49" moist, m. dense, orange/Brown, mf SAND, trace silt			
2					Saturated @ 40"			
3	3-3.5							
4								
5	5-5.5		60/60	0	0-25" SAA			
6					25-60" moist, gray/green, mf SAND, trace silt & gravel			
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: C. Watson	BORING/WELL ID: M54-SB-03
PROJECT NAME: FTMM - ECP	DRILLER: J. BARNAK	LOCATION DESCRIPTION
PROJECT LOCATION: FTMM Parcel	WEATHER: 80°F O.C.	M54
PROJECT NUMBER: 748810-	CONTRACTOR: East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	RIG TYPE: Geoprobe(R) 7822DT	LOCATION PLAN
WATER LEVEL: w surface	DATE/TIME START: 1420	Oceanport, New Jersey
DATE:	DATE/TIME FINISH: 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			60/54	0	0-14" saturated, light brown, mf SAND, trace silt, trace f gravel		
1				0	14"-30" saturated, f blue gravel		
2				1.2	30"-54" wet, organic material (wood fiber/roots), some silt, brown, soft		
3				4.6			
4				6.8			
5				1.3			
6				0.7			
7				1.8			
8				0.3			
9				1.1	0-28" saturated, f gravel and coarse sand, dark grey		
10				4.5	28"-55" wet, organics and silt, brown, soft		
11				60.6	55"-60" wet, dark grey, mf m. fine SAND, little silt		
12				23.8			
13				11.0			
14				13.8			
15				0.3			
16				4.7			
17				0			
18				0			
19							
20							

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: <i>LEE P. J.</i>	BORING/WELL ID: <i>M54-SB-03</i>
PROJECT NAME: FTMM - ECP	DRILLER:	LOCATION DESCRIPTION
PROJECT LOCATION: FTMM Parcel	WEATHER:	
PROJECT NUMBER: 748810-	CONTRACTOR: East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	RIG TYPE: Geoprobe(R) 7622DT	LOCATION PLAN
WATER LEVEL:	DATE/TIME START:	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
<i>1</i> ₀			<i>60/60</i>	<i>10.6</i>	<i>0-8" SAA</i>		
				<i>4.5</i>			
<i>1</i> ₁				<i>0</i>	<i>8"-18" Wet, Brown, soft organics and silt</i>		
				<i>1.1</i>			
<i>1</i> ₂				<i>0</i>	<i>18"-30" Wet, Dark grey, f</i>		
				<i>0.8</i>	<i>sand and silt, little</i>		
<i>1</i> ₃				<i>0</i>	<i>f organics, trace</i>		
				<i>0</i>	<i>f gravel</i>		
<i>1</i> ₄				<i>0</i>	<i>30-66" Wet, gray/green, soft</i>		
				<i>0</i>	<i>nf SAND, little silt,</i>		
<i>1</i> ₅				<i>0</i>	<i>trace f gravel</i>		
<i>6</i>							
<i>7</i>							
<i>8</i>							
<i>9</i>							
<i>0</i>							

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



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

January 10, 2017

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

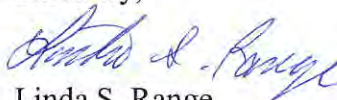
Re: *December 2016 Letter Work Plan Addendum for the FTMM-54 Area at FTMM-18*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin,

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced submittal, received December 30, 2016, prepared by the Department of the Army's Office of Assistant Chief of Staff for Installation Management. Sampling for further delineation of naphthalene, as proposed in the submittal, is acceptable.

Please contact this office if you have any questions.

Sincerely,



Linda S. Range

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



State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

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

BOB MARTIN
Commissioner

March 8, 2017

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

Re: *Response to Comments to NJDEP Comments on Final Remedial Investigation Report for FTMM-18 dated October 2015 (and Landfill Boundary Refinement for FTMM-18 only dated January 2016)*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin:

The New Jersey Department of Environmental Protection (Department) has performed a review of the referenced submittal, received on November 30, 2016.

Although the Department is not in agreement with the Army's position on several issues (e.g., *de minimus* quantities and/or test pit contents of primarily construction and demolition debris do not constitute a landfill; landfill material and soil contamination are two separate issues in determining the landfill boundaries; "it is generally recognized that scattered debris may exist outside the limits of a consolidated landfill"), each of the issues raised in the Department's August 9, 2016 correspondence has been adequately addressed, including a statement the contamination at locations B28, B34 and B31 would be addressed by the institutional and engineering controls. The Remedial Investigation Report and the Landfill Boundary Refinement component of the January 2016 submittal for FTMM-18 are approved based upon same.

Please contact this office with any questions.

Sincerely,

Linda S. Range

Attachment B – Previous Reports

1. VERSAR, Inc. (Versar), 2001. Underground Storage Tank Closure and Site Investigation Report, Building 296, Main Post – West Area, NJDEP UST Registration No. 81533-231 thru 223. May.

United States Army
Fort Monmouth, New Jersey

**Underground Storage Tank
Closure and Site Investigation
Report**

***Building 296
Main Post-West Area***

**NJDEP UST Registration No. 81533-213 thru 223
DICAR No. 93-11-02-1200-13**

May 2001

**UNDERGROUND STORAGE TANK
CLOSURE AND SITE INVESTIGATION REPORT**

BUILDING 296

**MAIN POST-WEST AREA
NJDEP UST REGISTRATION NO. 81533-213 THRU 223**

MAY 2001

PREPARED FOR:

**UNITED STATES ARMY, FORT MONMOUTH, NEW JERSEY
DIRECTORATE OF PUBLIC WORKS
BUILDING 167
FORT MONMOUTH, NJ 07703**

PREPARED BY:

***Versar* INC.**

**2558 PEARL BUCK ROAD
SUITE 1
BRISTOL, PA 19007**

PROJECT NO. 4936-127

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APPENDICES

Appendix A	NJDEP Standard Reporting Form
Appendix B	Site Assessment Summary
Appendix C	Waste Manifest
Appendix D	UST Disposal Certificate
Appendix E	Soil Analytical Data Package
Appendix F	Groundwater Analytical Data Package
Appendix G	Well Permits

EXECUTIVE SUMMARY

UST Closure

Between November 2, 1993, and November 4, 1993, eleven steel underground storage tanks (USTs) were closed by removal in accordance with New Jersey Department of Environmental Protection (NJDEP) closure procedures at the Main Post-West Area of the U.S. Army Fort Monmouth, Fort Monmouth, New Jersey. The USTs, NJDEP Registration Nos. 0081533-213 thru 223 (Fort Monmouth ID No. 296), were located south of Building 296. UST Nos. 081515-213 through 221 were all 1,000-2,000 gallon tanks containing gasoline. UST Nos. 081515-222 and 223 were both 1,000-gallon tanks containing diesel.

Site Assessment-Soil

The site assessment was performed by U.S. Army personnel in accordance with the NJDEP *Technical Requirements for Site Remediation* (N.J.A.C. 7:26E) and the NJDEP *Field Sampling Procedures Manual*. The sampling and laboratory analyses conducted during the site assessment were performed in accordance with Section 7:26E-2.1 of the *Technical Requirements for Site Remediation*. Soils surrounding the tanks were screened visually and with air monitoring equipment for evidence of contamination. Following removal, the USTs were inspected for corrosion holes. Numerous holes were noted in the USTs. Soils at the location of the holes were dark in color and appeared to be contaminated. Based on the inspection of the USTs, Directorate of Public Works (DPW) concluded that a discharge of petroleum products was associated with the USTs. The NJDEP hotline was notified and the case was assigned DICAR No. 93-11-02-1200-13. Groundwater was encountered at 6.0 feet below ground surface and sheen was observed on groundwater.

- On November 5, 1993, following the removal of the USTs and 130 feet of piping, approximately 16 cubic yards of potentially contaminated soil were removed from the excavation and from the piping trench due to visible contamination. Post-excavation soil samples A thru JJ were collected from thirty-four (34) locations within the UST excavation area and from the piping trench. Each of the samples was analyzed for total petroleum hydrocarbons (TPHC), total solids, lead, and Volatile Organic Compounds (VOCs).
- On November 23, 1993, following the removal of approximately 283 feet of piping, post-excavation soil samples BA thru BV were collected from twenty-two (22) locations along the former piping length of the excavation. Each of the samples was analyzed for TPHC, total solids, lead, and VOCs.
- On December 9, 1993, following the removal of approximately 99 feet of piping, post-excavation soil samples CA thru CJ were collected from nine (9) locations along the former piping length of the excavation. Each of the samples was analyzed for TPHC, total solids, lead, and VOCs.

- On December 29, 1993, following the removal of approximately 70 feet of piping, post-excavation soil samples A thru P were collected from fourteen (14) locations within the piping excavation. Each of the samples was analyzed for lead and VOCs.
- On January 5, 1994, following the removal of approximately 35 feet of piping, post-excavation soil samples Q, R, S, V, W, and X were collected from six (6) locations within the piping excavation. Each of the samples was analyzed for lead and VOCs.

Site Assessment-Findings

Analytical results of post-excavation soil samples collected between November 5, 1993, and January 5, 1994, contained either non-detectable concentrations of contaminants or concentrations of contaminants below the NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC).

Site Assessment-Groundwater

In response to the observation of potentially contaminated soil near the shallow water table, seven shallow overburden monitoring wells were installed at the Building 296 area.

- Between November 8, 1994, and August 18, 2000, monitoring wells MW-7 and MW-8 were sampled on a quarterly basis. Both wells were analyzed for VOCs calibrated for xylene plus 15 TICs, SVOCs plus 15 TICs, pesticide/PCB, and TAL metals.
- Between November 22, 1995, and August 18, 2000, monitoring wells MW-2, MW-3, and MW-4 were sampled on a quarterly basis. All wells were analyzed for VOCs calibrated for xylene plus 15 TICs, SVOCs plus 15 TICs, pesticide/PCB, and TAL metals.
- Between November 29, 1994, and August 18, 2000, monitoring wells MW-1 and MW-6 were sampled on a quarterly basis. Both wells were analyzed for VOCs calibrated for xylene plus 15 TICs, SVOCs plus 15 TICs, pesticide/PCB, and TAL metals.

The seven wells were constructed in accordance with NJDEP's well construction protocols outlined in its May 1992 *Field Sampling Procedures Manual*. The NJDEP well permits and well construction logs are presented in Appendix G.

Findings-Groundwater

A review of the historical groundwater analytical results indicates that concentrations of benzene, methylene chloride, bis (2-ethylhexyl phthalate), aluminum, iron, lead, manganese, silver, chromium, and sodium have been detected during these sampling events at concentrations that exceed the respective NJDEP GWQS. The methylene chloride and bis (2-ethylhexyl phthalate) detected in the samples are attributed to sampling and analytical interference.

Discrepancies

The removal contractor collected soil samples using polystyrene scoops instead of NJDEP approved stainless steel scoops. The results of the soil samples were therefore evaluated at 50% of the actual value to compensate for any potential loss due to absorbency of the polystyrene scoop.

Conclusion and Recommendations

Based on the analytical results of the post-excavation soil samples collected between November 5, 1993, and January 5, 1994, soil quality at the Building 296 UST closure site does not exceed the NJDEP RDCSCC. Therefore, no further action is warranted.

Based on the analytical results of the groundwater samples collected from the seven monitoring wells, groundwater quality at the Building 296 UST closure site exceeds the New Jersey Groundwater Quality Standard for benzene, aluminum, iron, lead, manganese, silver, chromium, and sodium. Future work to address groundwater quality conditions at Building 296 will be addressed in a Remedial Action Work Plan (RAWP).

1.0 UNDERGROUND STORAGE TANK DECOMMISSIONING ACTIVITIES

1.1 OVERVIEW

Eleven underground storage tanks (USTs), New Jersey Department of Environmental Protection (NJDEP) Registration No. 81533-213 thru 223, were closed at Building 296 at the Main Post-West area of U.S. Army Fort Monmouth, Fort Monmouth, New Jersey between November 2, 1993, and November 4, 1993. Refer to the Site Location Map, Figure 1. This report presents the results of the Department of Public Works' (DPW) implementation of the UST Decommissioning/Closure Plan approved by the NJDEP.

Decommissioning activities for UST Nos. 81533-213 thru 223 complied with all applicable Federal, State, and Local laws and ordinances in effect at the date of decommissioning. These laws included but were not limited to N.J.A.C. 7:14B-1 et seq., N.J.A.C. 5:23-1 et seq., and Occupational Safety and Health Administration (OSHA) 1910.146 and 1910.120. All permits including but not limited to the NJDEP-approved Decommissioning/Closure Plan were posted onsite for inspection. The decommissioning activities were conducted by DPW personnel who are registered and certified by the NJDEP for performing UST closure activities. Closure of UST Nos. 81533-213 thru 223 proceeded under the approval of the NJDEP Bureau of Federal Case Management (NJDEP-BFCM). The Standard Reporting Form and signed Site Assessment Summary form for UST Nos. 81533-213 thru 223 are included in Appendices A and B, respectively.

This UST Closure and Site Investigation Report has been prepared by Versar, to assist the U.S. Army DPW in complying with the NJDEP regulations. The applicable NJDEP regulations at the date of closure were the *Interim Closure Requirements for Underground Storage Tank Systems* (N.J.A.C. 7:14B-1 et seq. October 1990 and revisions dated November 1, 1991).

This report was prepared using information collected at the time of closure. Section 1 of this UST Closure and Site Investigation Report provides a summary of the UST decommissioning activities. Section 2 of this report describes the site investigation activities. Conclusions and recommendations, including the results of the soil sampling and groundwater investigation, are presented in the final section of this report.

1.2 SITE DESCRIPTION

Building 296 is located in the Main Post-West area of the Fort Monmouth Army Base. UST Nos. 0081533-213 thru 223 were located south of Building 296. A Site Map is provided as Figure 2.

1.2.1 Geological/Hydrogeological Setting

The following is a description of the geological/hydrogeological setting of the area surrounding Building 296. Included is a description of the regional geology of the area surrounding Fort Monmouth as well as descriptions of the local geology and hydrogeology of the Main Post area.

Regional Geology

Monmouth County lies within the New Jersey Section of the Atlantic Coastal Plain physiographic province. The Main Post, Charles Wood, and the Evans areas are located in what may be referred to as the Outer Coastal Plain subprovince, or the Outer Lowlands.

In general, New Jersey Coastal Plain formations consist of a seaward-dipping wedge of unconsolidated deposits of clay, silt, and gravel. These formations typically strike northeast-southwest with a dip ranging from 10 to 60 feet per mile and were deposited on Precambrian and lower Paleozoic rocks (Zapeczka, 1989). These sediments, predominantly derived from deltaic, shallow marine, and continental shelf environments, date from Cretaceous through the Quaternary Periods. The mineralogy ranges from quartz to glauconite.

The formations record several major transgressive/regressive cycles and contain units which are generally thicker to the southeast and reflect a deeper water environment. More than 20 regional geologic units are present within the sediments of the Coastal Plain. Regressive, upward coarsening deposits are usually aquifers (e.g., Englishtown and Kirkwood Formations, and the Cohansey Sand) while the transgressive deposits act as confining units (e.g., the Merchantville, Marshalltown, and Navesink Formations). The individual thicknesses for these units vary greatly (i.e., from several feet to several hundred feet). The Coastal Plain deposits thicken to the southeast from the Fall Line to greater than 6,500 feet in Cape May County (Brown and Zapeczka, 1990).

Local Geology

Based on the regional geologic map (Jablonski, 1968), the Cretaceous age Red Bank and Tinton Sands outcrop at the Main Post area. The Red Bank sand conformably overlies the Navesink Formation and dips to the southeast at 35 feet per mile. The upper member (Shrewsbury) of the Red Bank sand is a yellowish-gray to reddish brown clayey, medium-to-coarse-grained sand that contains abundant rock fragments, minor mica and glauconite (Jablonski). The lower member (Sandy Hook) is a dark gray to black, medium-to-fine grained sand with abundant clay, mica, and glauconite.

The Tinton sand conformably overlies the Red Bank Sand and ranges from a clayey medium to very coarse-grained feldspathic quartz and glauconite sand to glauconitic coarse sand. The color varies from dark yellowish orange or light brown to moderate brown and from light olive to grayish olive. Glauconite may constitute 60 to 80 percent of the sand fraction in the upper part of the unit (Minard, 1969). The upper part of the Tinton is often highly oxidized and iron oxide encrusted (Minard).

Hydrogeology

The water table aquifer in the Main Post area is identified as part of the "composite confining units," or minor aquifers. The minor aquifers include the Navesink formation, Red Bank Sand, Tinton Sand, Hornerstown Sand, Vincentown Formation, Manasquan Formation, Shark River Formation, Piney Point Formation, and the basal clay of the Kirkwood Formation.

Based on records of wells drilled in the Main Post area, water is typically encountered at depths of 2 to 9 feet below ground surface (bgs). According to Jablonski, wells drilled in the Red Bank and Tinton Sands may produce 2 to 25 gallons per minute (gpm). Some well owners have reported acidic water that requires treatment to remove iron.

Due to the proximity of the Atlantic Ocean to Fort Monmouth, shallow groundwater may be tidally influenced and may flow toward creeks and brooks as the tide goes out, and away from creeks and brooks as the tide comes in. However, an abundance of clay lenses and sand deposits were noted in borings installed throughout Fort Monmouth. Therefore, the direction of shallow groundwater should be determined on a case-by-case basis.

Shallow groundwater is locally influenced within the Main Post area by the following factors:

- tidal influence (based on proximity to the Atlantic Ocean, rivers, and tributaries)
- topography
- nature of the fill material within the Main Post area
- presence of clay and silt lenses in the natural overburden deposits
- local groundwater recharge areas (i.e., streams, lakes)

Due to the fluvial nature of the overburden deposits (i.e., sand and clay lenses), shallow groundwater flow direction is best determined on a case-by-case basis. This is consistent with lithologies observed in borings installed within the Main Post area, which primarily consisted of fine-to-medium grained sands, with occasional lenses or laminations of gravel silt and/or clay.

Building 296 is located approximately 600 feet south of Parkers Creek, the nearest surface water. Based on the Main Post topography, the groundwater flow in the area of Building 296 is anticipated to be to the north.

1.3 HEALTH AND SAFETY

Before, during, and after all decommissioning activities, hazards at the work site which may have posed a threat to the Health and Safety of all personnel who were involved with, or were affected by, the decommissioning of the UST system were minimized. All areas which posed or may have been suspected to pose a vapor hazard were monitored by a qualified individual utilizing an organic vapor analyzer (OVA). The individual ascertained if the area was properly vented to render the area safe, as defined by OSHA.

1.4 REMOVAL OF UNDERGROUND STORAGE TANK

1.4.1 General Procedures

- The contractor performing the closure prior to excavation activities identified all underground obstructions (utilities, etc.).
- All activities were carried out with the greatest regard to safety and health and the safeguarding of the environment.
- All excavated soils were visually examined and screened with an Organic Vapor Analyzer (OVA) for evidence of contamination. Potentially contaminated soils were identified and documented during closure activities.
- Surface materials (i.e., asphalt, concrete, etc.) were excavated and staged separately from all soil and recycled in accordance with applicable regulations and laws.
- An NJDEP certified Subsurface Evaluator from the DPW was present during all site assessment activities.

1.4.2 Underground Storage Tank Excavation and Cleaning

Prior to UST decommissioning activities, surficial soil was removed to expose the USTs and associated piping. The USTs were then completely emptied of all liquids and cleaned prior to removal from the excavation. Approximately 10,500 gallons of liquid from the UST and associated piping were transported by Freehold Cartage to the Lionetti Oil Recovery Co., Inc. facility, a NJDEP-approved petroleum recycling and disposal company located in Old Bridge, New Jersey. Refer to Appendix C for the waste manifest.

The USTs were cleaned prior to removal from the excavation in accordance with the NJDEP regulations. After the USTs were removed from the excavation, it was staged on polyethylene sheeting and examined for holes. Numerous holes were observed during the inspection by the Subsurface Evaluator. Soils surrounding the USTs were screened visually and with an OVA for evidence of contamination. Soils were stained and appeared to be contaminated. Groundwater was encountered at 6.0 feet below ground surface and sheen was observed on groundwater.

1.5 UNDERGROUND STORAGE TANK TRANSPORTATION AND DISPOSAL

The tank was transported in compliance with all applicable regulations and laws to Mazza & Sons, Inc. Refer to Appendix D for the UST Disposal Certificate.

The UST was labeled prior to transport with the following information:

- Site of origin

- Contact person
- NJDEP UST Facility ID number
- Former contents
- Destination site
- Date

1.6 MANAGEMENT OF EXCAVATED SOILS

All potentially contaminated soils were stockpiled separately from other excavated material and were placed on and covered with polyethylene sheets. Potentially contaminated soils were transported to the soil staging area. Soils that did not exhibit signs of contamination were used as backfill following the removal of the UST. Groundwater was encountered at 6.0 feet below ground surface and sheen was observed on groundwater.

2.0 SITE INVESTIGATION ACTIVITIES

2.1 OVERVIEW

The Site Investigation was managed and carried out by U.S. Army DPW personnel. All analyses were performed and reported by U.S. Army Fort Monmouth Environmental Laboratory, a NJDEP-certified testing laboratory. All sampling was performed under the direct supervision of a NJDEP Certified Subsurface Evaluator according to the methods described in the NJDEP *Field Sampling Procedures Manual* (1992). Sampling frequency and parameters analyzed complied with the NJDEP document, *Interim Closure Requirements for Underground Storage Tank Systems* (October 1990 and revisions dated November 1, 1991), which was the applicable regulation at the date of the closure. The Fort Monmouth DPW Environmental Office maintains all records of the Site Investigation activities.

The following Parties participated in Closure and Site Investigation Activities:

- Subsurface Evaluator: Charles Appleby
Employer: U.S. Army, Fort Monmouth
Phone Number: (732) 532-0989
NJDEP Certification No.: 002056
- Analytical Laboratory: U.S. Army Fort Monmouth Environmental laboratory
Contact Person: Brian McKee
Phone Number: (908) 532-4359
NJDEP Company Certification No.: 13461
- Hazardous Waste Hauler: Freehold Cartage
Contact Person: David Smith
Phone Number: (908) 462-1001

2.2 FIELD SCREENING/MONITORING

Field screening was performed by a NJDEP Certified Sub-Surface Evaluator using an OVA and visual observations to identify potentially contaminated material. Groundwater was encountered at 6.0 feet below ground surface and sheen was observed on groundwater.

2.3 SOIL SAMPLING

U.S. Army personnel performed the site assessment in accordance with the NJDEP Technical Requirements and the NJDEP Field Sampling Procedures Manual. A summary of sampling activities including parameters analyzed is provided in Table 1. The post-excavation soil samples were collected using NJDEP *Field Sampling Procedures Manual* (1992) standard sampling procedures. Following soil sampling activities, the samples were chilled and delivered to U.S. Army Fort Monmouth Environmental Laboratory located in Fort Monmouth, New Jersey, for analysis. The following soil samples were collected:

- On November 5, 1993, following the removal of the USTs and 130 feet of piping, approximately 16 cubic yards of potentially contaminated soil were removed from the excavation and from the piping trench due to visible contamination. Post-excavation soil samples A thru JJ were collected from thirty-four (34) locations within the UST excavation area and from the piping trench. Each of the samples was analyzed for total petroleum hydrocarbons (TPHC), total solids, lead, and Volatile Organic Compounds (VOCs).
- On November 23, 1993, following the removal of approximately 283 feet of piping, post-excavation soil samples BA thru BV were collected from twenty-two (22) locations along the former piping length of the excavation. Each of the samples was analyzed for TPHC, total solids, lead, and VOCs.
- On December 9, 1993, following the removal of approximately 99 feet of piping, post-excavation soil samples CA thru CJ were collected from nine (9) locations along the former piping length of the excavation. Each of the samples was analyzed for TPHC, total solids, lead, and VOCs.
- On December 29, 1993, following the removal of approximately 70 feet of piping, post-excavation soil samples A thru P were collected from fourteen (14) locations within the piping excavation. Each of the samples was analyzed for lead and VOCs.
- On January 5, 1994, following the removal of approximately 35 feet of piping, post-excavation soil samples Q, R, S, V, W, and X were collected from six (6) locations within the piping excavation. Each of the samples was analyzed for lead and VOCs.

2.4 MONITORING WELL SAMPLING

Groundwater sampling and analysis were performed in accordance with the NJDEP *Field Sampling Procedures Manual*, and the *Technical Requirements for Site Remediation*, N.J.A.C. 7:26E (*Technical Requirements*). The following groundwater samples were collected from monitoring wells at the site (see Table 1).

- Between November 8, 1994, and August 18, 2000, monitoring wells MW-7 and MW-8 were sampled on a quarterly basis. Both wells were analyzed for VOCs calibrated for xylene plus 15 TICs, SVOCs plus 15 TICs, pesticide/PCB, and TAL metals.
- Between November 22, 1995, and August 18, 2000, monitoring wells MW-2, MW-3, and MW-4 were sampled on a quarterly basis. The samples from these wells were analyzed for VOCs calibrated for xylene plus 15 TICs, SVOCs plus 15 TICs, pesticide/PCB, and TAL metals.
- Between November 29, 1994, and August 18, 2000, monitoring wells MW-1 and MW-6 were sampled on a quarterly basis. Both wells were analyzed for VOCs calibrated for xylene plus 15 TICs, SVOCs plus 15 TICs, pesticide/PCB, and TAL metals.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 SOIL SAMPLING RESULTS

To evaluate soil conditions following removal of the USTs and associated piping, eighty-five (85) post-excavation sample results were compared to NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) and Impact to Groundwater Soil Cleanup Criteria (IGWSCC) (N.J.A.C. 7:26D and revisions dated May 12, 1999). Summaries of analytical results for soils are presented in Tables 2 to 4 and the associated soil sampling locations are shown on Figure 3. The analytical data package is provided in Appendix E.

Excavation of potentially contaminated soil from the area surrounding the UST was performed between November 5, 1993, and January 5, 1994. All potentially contaminated soils were stockpiled separately from other excavated material and were placed on and covered with polyethylene sheets. Potentially contaminated soils were transported to the soil staging area.

Analytical results of post-excavation soil samples collected between November 5, 1993, and January 5, 1994, contained either non-detectable concentrations of contaminants or concentrations of contaminants below the NJDEP RDCSCC.

3.2 GROUNDWATER SAMPLING RESULTS

A review of the historical groundwater analytical results indicates that concentrations of benzene, methylene chloride, bis (2-ethylhexyl phthalate), aluminum, iron, lead, manganese, silver, chromium, and sodium have been detected during these sampling events at concentrations that exceed the respective NJDEP GWQS. The methylene chloride and bis (2-ethylhexyl phthalate) detected in the samples are most likely due to laboratory contamination. The groundwater analytical data is summarized in Table 5. The groundwater sampling locations are shown on Figure 4. Refer to Appendix F for the groundwater analytical data package.

3.3 CONCLUSIONS AND RECOMMENDATIONS

Based on the analytical results of the post-excavation soil samples collected between November 5, 1993, and January 5, 1994, soil quality at the Building 296 UST closure site does not exceed the NJDEP RDCSCC. Therefore, no further action is warranted.

Based on the analytical results of the groundwater samples collected from the seven monitoring wells, groundwater quality at the Building 296 UST closure site exceeds the New Jersey Groundwater Quality Standard for benzene, aluminum, iron, lead, manganese, silver, chromium, and sodium. Future work to address groundwater quality conditions at Building 296 will be addressed in a Remedial Action Work Plan (RAWP). The RAWP will be recommending long term monitoring natural attenuation.

TABLES

TABLE 1a
SUMMARY OF SAMPLING ACTIVITIES
NOVEMBER 5, 1993
Fort Monmouth, Main Post
Site 296

Sample Identification /Sample Depths	Analytical Parameters	Sample Type	Date Collected
Site A/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site B/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site C/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site D/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site E/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site F/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site G/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site H/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site I/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site J/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site K/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site L/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site M/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site N/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site O/7-7.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site P/7-7.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site Q/7-7.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site R/7-7.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site S/7-7.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site T/7-7.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site U/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site V/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site W/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site X/6-6.5'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site AA/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site BB/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site CC/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site DD/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site EE/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site FF/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site GG/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site HH/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site II/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	11/05/93
Site JJ/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	11/05/93

Notes:

TPHC- Total Petroleum Hydrocarbons

VOCs- Volatile Organic Compounds

296Table1_complete.xls

TABLE 1b
SUMMARY OF SAMPLING ACTIVITIES
NOVEBER 23, 1993
Fort Monmouth, Main Post
Site 296

Sample Identification /Sample Depths	Analytical Parameters	Sample Type	Date Collected
BA/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BB/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BC/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BD/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BE/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BF/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BG/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BH/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BI/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BJ/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BK/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BL/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BM/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BN/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BO/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BP/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BQ/2.5-3'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BR/2-2.5'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BS/2-2.5'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BT/2-2.5'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BU/2-2.5'	TPHC, VOCs, Lead	Post-Excavation	11/23/93
BV/2-2.5'	TPHC, VOCs, Lead	Post-Excavation	11/23/93

Notes:

TPHC- Total Petroleum Hydrocarbons
VOCs- Volatile Organic Compounds

TABLE 1c
SUMMARY OF SAMPLING ACTIVITIES
DECEMBER 9, 1993
Fort Monmouth, Main Post
Site 296

Sample Identification	Analytical Parameters	Sample Type	Date Collected
CA/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	12/09/93
CB/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	12/09/93
CC/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	12/09/93
CD/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	12/09/93
CE/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	12/09/93
CF/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	12/09/93
CG/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	12/09/93
CH/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	12/09/93
CI/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	12/09/93
CJ/2.5-3'	TPHC,VOCs,Lead	Post-Excavation	12/09/93

Notes:

TPHC- Total Petroleum Hydrocarbons
VOCs- Volatile Organic Compounds

TABLE 1d
SUMMARY OF SAMPLING ACTIVITIES
DECEMBER 29, 1993
Fort Monmouth, Main Post
Site 296

Sample Identification /Sample Depths	Analytical Parameters	Sample Type	Date Collected
A/3.5-4'	VOCs,Lead	Post-Excavation	12/29/93
B/3.5-4'	VOCs,Lead	Post-Excavation	12/29/93
C/2-2.5'	VOCs,Lead	Post-Excavation	12/29/93
F/3.5-4'	VOCs,Lead	Post-Excavation	12/29/93
G/3.5-4'	VOCs,Lead	Post-Excavation	12/29/93
H/3.5-4'	VOCs,Lead	Post-Excavation	12/29/93
I/3-4'	VOCs,Lead	Post-Excavation	12/29/93
J/1-1.5'	VOCs,Lead	Post-Excavation	12/29/93
K/8"-10"	VOCs,Lead	Post-Excavation	12/29/93
L/8"-10"	VOCs,Lead	Post-Excavation	12/29/93
M/8"-10"	VOCs,Lead	Post-Excavation	12/29/93
N/3-3.5'	VOCs,Lead	Post-Excavation	12/29/93
O/3-3.8'	VOCs,Lead	Post-Excavation	12/29/93
P/3-3.5'	VOCs,Lead	Post-Excavation	12/29/93

Notes:

TPHC- Total Petroleum Hydrocarbons
VOCs- Volatile Organic Compounds

TABLE 1e
SUMMARY OF SAMPLING ACTIVITIES
JANUARY 5, 1994
Fort Monmouth, Main Post
Site 296

Sample Identification /Sample Depths	Analytical Parameters	Sample Type	Date Collected
Q/2.5-3'	VOCs,Lead	Post-Excavation	01/05/94
R/2.5-3'	VOCs,Lead	Post-Excavation	01/05/94
S/2.5-3'	VOCs,Lead	Post-Excavation	01/05/94
V/2.5-3'	VOCs,Lead	Post-Excavation	01/05/94
W/2.5-3'	VOCs,Lead	Post-Excavation	01/05/94
X/2.5-3'	VOCs,Lead	Post-Excavation	01/05/94

Notes:

TPHC- Total Petroleum Hydrocarbons
VOCs- Volatile Organic Compounds

TABLE 2a
SOIL ANALYTICAL RESULTS FOR TPHC
NOVEBER 5, 1993
Fort Monmouth, Main Post
Site 296

Sample Identification	TPHC	Total Solid	NJDEP Cleanup Criteria for TPHC (mg/kg)	Date Collected
Site A	9.58	84	10,000	11/05/93
Site B	4.78	83	10,000	11/05/93
Site C	9.25	87	10,000	11/05/93
Site D	12.4	87	10,000	11/05/93
Site E	7.2	74	10,000	11/05/93
Site F	8.46	79	10,000	11/05/93
Site G	10.9	86	10,000	11/05/93
Site H	10.9	86	10,000	11/05/93
Site I	7.5	71	10,000	11/05/93
Site J	11.2	84	10,000	11/05/93
Site K	9.93	81	10,000	11/05/93
Site L	10.4	90	10,000	11/05/93
Site M	ND	84	10,000	11/05/93
Site N	7.96	84	10,000	11/05/93
Site O	18.8	86	10,000	11/05/93
Site P	6.34	84	10,000	11/05/93
Site Q	ND	76	10,000	11/05/93
Site R	6.2	86	10,000	11/05/93
Site S	11.2	84	10,000	11/05/93
Site T	7.96	84	10,000	11/05/93
Site U	32.2	84	10,000	11/05/93
Site V	9.46	85	10,000	11/05/93
Site W	7.77	86	10,000	11/05/93
Site X	9.3	86	10,000	11/05/93
Site AA	64.8	87	10,000	11/05/93
Site BB	43.2	91	10,000	11/05/93
Site CC	201	87	10,000	11/05/93
Site DD	8.46	79	10,000	11/05/93
Site EE	21.7	87	10,000	11/05/93
Site FF	47.7	88	10,000	11/05/93
Site GG	27.7	88	10,000	11/05/93
Site HH	39.6	82	10,000	11/05/93
Site II	20.4	86	10,000	11/05/93
Site JJ	39.8	85	10,000	11/05/93

Notes:

1. All results reported in milligrams per kilogram (mg/kg).

TPHC- Total Petroleum Hydrocarbons

ND- Not detected

TABLE 2b
SOIL ANALYTICAL RESULTS FOR TPHC
NOVEMBER 23, 1993
Fort Monmouth, Main Post
Site 296

Sample Identification	TPHC	Total Solid	NJDEP Cleanup Criteria for TPHC (mg/kg)	Date Collected
BA	7.7	92	10,000	11/23/93
BB	ND	92	10,000	11/23/93
BC	8.83	83	10,000	11/23/93
BD	64.8	84	10,000	11/23/93
BE	23.9	88	10,000	11/23/93
BF	ND	91	10,000	11/23/93
BG	ND	88	10,000	11/23/93
BH	ND	87	10,000	11/23/93
BI	31.8	93	10,000	11/23/93
BJ	79.4	90	10,000	11/23/93
BK	ND	93	10,000	11/23/93
BL	ND	93	10,000	11/23/93
BM	ND	96	10,000	11/23/93
BN	ND	89	10,000	11/23/93
BO	21	90	10,000	11/23/93
BP	41.6	99	10,000	11/23/93
BQ	ND	97	10,000	11/23/93
BR	3.65	97	10,000	11/23/93
BS	195	98	10,000	11/23/93
BT	ND	98	10,000	11/23/93
BU	ND	98	10,000	11/23/93
BV	354	98	10,000	11/23/93

Notes:

1. All results reported in milligrams per kilogram (mg/kg).

TPHC- Total Petroleum Hydrocarbons

ND- Not detected

TABLE 2c
SOIL ANALYTICAL RESULTS FOR TPHC
DECEMBER 9, 1993
Fort Monmouth, Main Post
Site 296

Sample Identification	TPHC	Total Solid	NJDEP Cleanup Criteria for TPHC (mg/kg)	Date Collected
CA	18.1	98	10,000	12/09/93
CB	97.5	98	10,000	12/09/93
CC	31.7	97	10,000	12/09/93
CD	7.61	97	10,000	12/09/93
CE	11.6	97	10,000	12/09/93
CF	317	98	10,000	12/09/93
CG	166	96	10,000	12/09/93
CH	53.4	94	10,000	12/09/93
CI	3,340	96	10,000	12/09/93
CJ	686	96	10,000	12/09/93

Notes:

1. All results reported in milligrams per kilogram (mg/kg).

TPHC- Total Petroleum Hydrocarbons

ND- Not detected

TABLE 3a
SOIL ANALYTICAL RESULTS FOR DETECTED VOLATILES ORGANIC COMPOUNDS
NOVEMBER 5, 1993
Fort Monmouth, Main Post
Site 296

Detected Volatile Organic Compounds	Site C	Site G	Site H	Site I	Site K	NJDEP RDCSCC
Acetone	ND	0.0087 J	0.0089 J	0.04	0.026	1,000
# of TICs	6	0	0	0	0	1,000
TIC Concentration (total)	0.035	ND	ND	ND	ND	

Detected Volatile Organic Compounds	Site M	Site O	Site P	Site Q	Site U	NJDEP RDCSCC
Acetone	0.10 J	0.2	0.10 J	0.26 B	0.016	1,000
2-Butanone	ND	0.029	ND	0.034 J	ND	1,000
# of TICs	0	8	0	0	0	1,000
TIC Concentration (total)	ND	0.082	ND	ND	ND	

Detected Volatile Organic Compounds	Site AA	Site BB	Site CC	Site DD	Site JJ	NJDEP RDCSCC
Benzene	0.11	ND	ND	ND	ND	3
Toluene	0.36	ND	ND	ND	ND	1,000
Ethylbenzene	0.16	ND	ND	ND	ND	1,000
Xylenes (total)	0.5	ND	ND	ND	ND	410
Acetone	ND	0.075	0.11	0.062	0.0059 JB	1,000
2-Butanone	ND	ND	0.018	0.0086 J	ND	1,000
# of TICs	20	0	0	5	0	1,000
TIC Concentration (total)	7.18	ND	ND	0.049	ND	

Notes:

- All results reported in milligrams per kilogram (mg/kg).
- NJDEP- New Jersey Department of Environmental Protection
RDCSCC- Residential Direct Contact Soil Cleanup Criteria
IGWSCC- Impact to Ground water Soil Cleanup Criteria
TIC- Tentatively identified compound
J- Estimated concentration
B- Compound detected in blank
ND- Not detected
NA- Not applicable

TABLE 3b
SOIL ANALYTICAL RESULTS FOR DETECTED VOLATILES ORGANIC COMPOUNDS
NOVEMBER 23,1993
Fort Monmouth, Main Post
Site 296

Detected Volatile Organic Compounds	BA	BB	BC	BD	BE	NJDEP RDCSCC
Acetone	0.095	0.14	0.034	0.054	0.11	1,000
2-Butanone	0.013 J	0.015	0.066 J	0.098 J	0.022	1,000
Xylenes (total)	0.37	ND	ND	ND	ND	410
# of TICs	20	0	0	0	0	1,000
TIC Concentration (total)	2.872	ND	ND	ND	ND	

Detected Volatile Organic Compounds	BF	BG	BH	BI	BJ	NJDEP RDCSCC
Acetone	0.11	0.14	0.11	0.081	0.13	1,000
2-Butanone	0.018	0.017	0.017	0.0069 J	0.016	1,000
# of TICs	0	0	0	0	0	1,000
TIC Concentration (total)	ND	ND	ND	ND	ND	

Detected Volatile Organic Compounds	BK	BL	BM	BN	BO	NJDEP RDCSCC
Acetone	0.096	0.1	0.081	0.029	0.0026 J	1,000
2-Butanone	0.022	0.015	0.017	ND	ND	1,000
# of TICs	0	0	0	0	0	1,000
TIC Concentration (total)	ND	ND	ND	ND	ND	

Detected Volatile Organic Compounds	BP	BQ	BR	BS	BT	NJDEP RDCSCC
Acetone	0.15	0.3	0.2	0.094	0.075	1,000
2-Butanone	0.036	0.023	0.026	0.0083 J	0.0072 J	1,000
# of TICs	0	0	0	0	0	1,000
TIC Concentration (total)	ND	ND	ND	ND	ND	

Detected Volatile Organic Compounds	BU	BV	NJDEP RDCSCC	NJDEP IGWSCC
Acetone	0.2	0.24	1,000	100
2-Butanone	0.016	0.038	1,000	50
# of TICs	0	5	1,000	1,000
TIC Concentration (total)	ND	0.042		

Notes:

- All results reported in milligrams per kilogram (mg/kg).
- NJDEP- New Jersey Department of Environmental Protection
RDCSCC- Residential Direct Contact Soil Cleanup Criteria
IGWSCC- Impact to Ground water Soil Cleanup Criteria
TIC- Tentatively identified compound
J- Estimated concentration
ND- Not detected
NA- Not applicable

TABLE 3c
SOIL ANALYTICAL RESULTS FOR DETECTED VOLATILES ORGANIC COMPOUNDS
DECEMBER 9, 1993
Fort Monmouth, Main Post
Site 296

Detected Volatile Organic Compounds	CA	CB	CC	CD	CE	NJDEP RDCSCC
Acetone	0.016 B	0.015 B	0.010 JB	0.012 B	0.013 B	1,000
Toluene	ND	ND	ND	ND	0.0043 J	1,000
Xylenes (total)	ND	ND	ND	ND	0.002 J	410
# of TICs	0	0	0	0	0	1,000
TIC Concentration (total)	ND	0.437	ND	ND	ND	

Detected Volatile Organic Compounds	CF	CG	CH	CI	CJ	NJDEP RDCSCC
Acetone	0.020 B	0.014 B	0.015 B	0.76 JB	ND	1,000
Xylenes (total)	0.0031	ND	0.014 J	0.48 J	2.1	410
# of TICs	20	12	19	20	20	1,000
TIC Concentration (total)	0.174	0.113	1.218	170.1	187.4	

Notes:

- All results reported in milligrams per kilogram (mg/kg).
- NJDEP- New Jersey Department of Environmental Protection
RDCSCC- Residential Direct Contact Soil Cleanup Criteria
IGWSCC- Impact to Ground water Soil Cleanup Criteria
TIC- Tentatively identified compound
J- Estimated concentration
B- Compound detected in blank
ND- Not detected
NA- Not applicable

TABLE 3e
SOIL ANALYTICAL RESULTS FOR DETECTED VOLATILES ORGANIC COMPOUNDS
JANUARY 5, 1994
Fort Monmouth, Main Post
Site 296

Detected Volatile Organic Compounds	Q	R	S	NJDEP RDCSCC	NJDEP IGWSCC
Acetone	0	ND	ND	1,000	100
Methylene Chloride	0.003 J	0	0	49	1
Xylenes (total)	ND	0.0026 J	ND	410	10
# of TICs	0	0	0	1,000	1,000
TIC Concentration (total)	ND	ND	ND		

Detected Volatile Organic Compounds	V	W	X	NJDEP RDCSCC	NJDEP IGWSCC
Acetone	0.060 B	0.046 B	0.28 B	1,000	100
Methylene Chloride	0	0	0	49	1
# of TICs	0	0	0	1,000	1,000
TIC Concentration (total)	ND	ND	ND		

Notes:

1. All results reported in milligrams per kilogram (mg/kg).

NJDEP- New Jersey Department of Environmental Protection

RDCSCC- Residential Direct Contact Soil Cleanup Criteria

IGWSCC- Impact to Ground water Soil Cleanup Criteria

TIC- Tentatively identified compound

J- Estimated concentration

B- Compound detected in blank

ND- Not detected

NA- Not applicable

TABLE 4a
SOIL ANALYTICAL RESULTS FOR LEAD
NOVEMBER 5, 1993
Fort Monmouth, Main Post
Site 296

Sample Identification	Total Lead	NJDEP RDCSCC (mg/kg)	Date Collected
Site A	28.3	400	11/05/93
Site B	14.1	400	11/05/93
Site C	33.3	400	11/05/93
Site D	60.7	400	11/05/93
Site E	ND	400	11/05/93
Site F	ND	400	11/05/93
Site G	ND	400	11/05/93
Site H	22.4	400	11/05/93
Site I	ND	400	11/05/93
Site J	20.7	400	11/05/93
Site K	ND	400	11/05/93
Site L	33.6	400	11/05/93
Site M	ND	400	11/05/93
Site N	15.9	400	11/05/93
Site O	14.9	400	11/05/93
Site P	13.5	400	11/05/93
Site Q	25.0	400	11/05/93
Site R	21.2	400	11/05/93
Site S	17.5	400	11/05/93
Site T	33.8	400	11/05/93
Site U	23.4	400	11/05/93
Site V	56.4	400	11/05/93
Site W	28.6	400	11/05/93
Site X	32.1	400	11/05/93
Site AA	13.0	400	11/05/93
Site BB	ND	400	11/05/93
Site CC	78.0	400	11/05/93
Site DD	61.1	400	11/05/93
Site EE	42.9	400	11/05/93
Site FF	89.3	400	11/05/93
Site GG	22.4	400	11/05/93
Site HH	29.5	400	11/05/93
Site II	21.2	400	11/05/93
Site JJ	46.7	400	11/05/93

Notes:

1. All results reported in milligrams per kilogram (mg/kg).

RDCSCC- Residential Direct Contact Soil Cleanup Criteria.

ND- Not detected

TABLE 4b
SOIL ANALYTICAL RESULTS FOR LEAD
NOVEMBER 23, 1993
Fort Monmouth, Main Post
Site 296

Sample Identification	Total Lead	NJDEP RDCSCC (mg/kg)	Date Collected
BA	20.5	400	11/23/93
BB	ND	400	11/23/93
BC	16.4	400	11/23/93
BD	30.2	400	11/23/93
BE	21.2	400	11/23/93
BF	ND	400	11/23/93
BG	21.4	400	11/23/93
BH	27.4	400	11/23/93
BI	15.3	400	11/23/93
BJ	15.7	400	11/23/93
BK	20.5	400	11/23/93
BL	ND	400	11/23/93
BM	ND	400	11/23/93
BN	20.1	400	11/23/93
BO	22.8	400	11/23/93
BP	108.0	400	11/23/93
BQ	25.0	400	11/23/93
BR	26.2	400	11/23/93
BS	22.8	400	11/23/93
BT	34.4	400	11/23/93
BU	ND	400	11/23/93
BV	57.0	400	11/23/93

Notes:

1. All results reported in milligrams per kilogram (mg/kg).

RDCSCC- Residential Direct Contact Soil Cleanup Criteria.

ND- Not detected

TABLE 4d
SOIL ANALYTICAL RESULTS FOR LEAD
DECEMBER 29, 1993
Fort Monmouth, Main Post
Site 296

Sample Identification	Total Lead	NJDEP RDCSCC (mg/kg)	Date Collected
A	ND	400	12/29/93
B	ND	400	12/29/93
C	ND	400	12/29/93
F	ND	400	12/29/93
G	ND	400	12/29/93
H	ND	400	12/29/93
I	ND	400	12/29/93
J	ND	400	12/29/93
K	ND	400	12/29/93
L	237.0	400	12/29/93
M	87.0	400	12/29/93
N	26.9	400	12/29/93
O	16.1	400	12/29/93
P	ND	400	12/29/93

Notes:

1. All results reported in milligrams per kilogram (mg/kg).

RDCSCC- Residential Direct Contact Soil Cleanup Criteria.

ND- Not detected

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
BUILDING NO. 296
FORT MONMOUTH, NEW JERSEY

Well	Sample Date	Acetone	Lead	Methylene Chloride	di-n-Butyl phthalate	Butyl benzyl phthalate	bis(2-Ethyl hexyl phthalate)	Aluminum	Iron	Manganese	Chromium	Silver	Sodium
UNITS:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NJDEP CRITERIA:		700	10	2	900	100	30	200	300	50	100	20	50000
296MW01	11/29/94	ND	26.5	--	--	--	--	--	--	--	--	--	--
296MW01	06/16/97	ND	ND	ND	82.7	27.8	5.12	758	4570	163	ND	27	23640
296MW01	08/18/97	ND	ND	5.18	ND	ND	ND	543	20850	144	13	ND	22160
296MW01	11/17/97	ND	12	ND	ND	ND	ND	466	3079	107	1.0	ND	17700
296MW01	02/27/98	ND	ND	ND	ND	ND	ND	1388	16820	138	3.3	ND	20150
296MW01	05/18/98	ND	2.5	ND	ND	ND	ND	913	13690	146	ND	ND	22780
296MW01	08/21/98	ND	2.92	ND	ND	ND	ND	940	17900	125	3.29	ND	16600
296MW01	12/02/98	ND	2.42	ND	ND	ND	ND	1050	8910	117	5.65	ND	16700
296MW01	02/19/99	ND	2.99	ND	ND	ND	ND	587	6640	142	3.26	ND	23000
296MW01	06/25/99	ND	ND	ND	ND	ND	ND	786	6030	179	2.81	ND	24700
296MW01	09/20/99	ND	7.72	ND	ND	ND	ND	445	4810	166	2.37	ND	17500
296MW01	12/27/99	ND	ND	ND	ND	ND	ND	642	6660	140	1.35	ND	23100
296MW01	03/23/00	ND	ND	ND	ND	ND	ND	441	3210	154	1.07	ND	17100
296MW01	06/28/00	ND	20.5	ND	ND	ND	ND	601	4560	198	4.02	ND	21900
296MW01	08/18/00	ND	4.43	ND	ND	ND	ND	412	7730	172	1.32	ND	15900
296MW01	08/18/00 D	13.71	3.69	ND	ND	ND	ND	428	7880	178	1.56	ND	16100

Note:

Gray shading indicates exceedance of New Jersey Ground Water Quality Criteria (GWQC) defined in NJAC 7:9-6.

Abbreviations:

MW: Monitoring Well.

ND: Not Detected.

ug/L: Micrograms per liter.

D: Value from dilution.

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
BUILDING NO. 296
FORT MONMOUTH, NEW JERSEY

Well	Sample Date	Acetone	2-Butanone	Lead	di-n-Butyl phthalate	Butyl benzyl phthalate	bis(2-Ethyl hexyl phthalate)	Fluorene	Fluoranthene	Pyrene	Benzo (a) anthracene	Chrysene	Benzo (b) fluoranthene	Benzo (k) fluoranthene
UNITS: NJDEP CRITERIA:		ug/L 700	ug/L 300	ug/L 10	ug/L 900	ug/L 100	ug/L 30	ug/L 300	ug/L 300	ug/L 200	ug/L 20	ug/L 20	ug/L 10	ug/L 2
296MW02	11/22/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
296MW02	06/16/97	ND	ND	ND	11.4	5.8	8.5	ND	ND	ND	ND	ND	ND	ND
296MW02	08/18/97	ND	ND	27	ND	ND	19.98	1.88	3.53	5.34	1.82	2.02	1.18	1.42
296MW02	11/17/97	ND	ND	30	1.53	ND	2.12	ND	ND	ND	ND	ND	ND	ND
296MW02	02/27/98	ND	ND	836	ND	ND	16.57	ND	2.29	5.14	1.49	2.88	1.00	1.09
296MW02	05/18/98	ND	ND	16.5	ND	ND	1.37	ND	ND	ND	ND	ND	ND	ND
296MW02	08/21/98	11.21	1.9	31.8	ND	ND	3.37	ND	ND	1.49	ND	ND	ND	ND
296MW02	12/02/98	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
296MW02	02/19/99	ND	ND	4.72	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
296MW02	06/25/99	ND	ND	16.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
296MW02	09/20/99	ND	ND	12.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
296MW02	12/27/99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
296MW02	03/23/00	ND	ND	6.30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
296MW02	06/28/00	ND	ND	28.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
296MW02	6/28/00 D	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
296MW02	08/18/00	22.86	ND	7.74	ND	ND	3.72	ND	ND	ND	ND	ND	ND	ND

Note:

Gray shading indicates exceedance of New Jersey
Ground Water Quality Criteria (GWQC) defined in NJAC
7:9-6.

Abbreviations:

MW: Monitoring Well.
ND: Not Detected.
ug/L: Micrograms per liter.
D: Value from dilution.

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
BUILDING NO. 296
FORT MONMOUTH, NEW JERSEY

Well	Sample Date	Benzo (a) pyrene	Aluminum	Iron	Manganese	Chromium	Silver	Sodium
UNITS: NJDEP CRITERIA		ug/L 20	ug/L 200	ug/L 300	ug/L 50	ug/L 100	ug/L 20	ug/L 50000
296MW02	11/22/95	ND	-	-	-	-	-	-
296MW02	06/16/97	ND	560	2690	93	ND	27	29600
296MW02	08/18/97	2.22	584	17530	155	27	ND	37170
296MW02	11/17/97	ND	3690	12920	44	46	ND	12750
296MW02	02/27/98	1.59	171900	4166	682	1344	ND	22710
296MW02	05/18/98	ND	16740	133910	107	112	ND	38310
296MW02	08/21/98	ND	27400	54900	75.8	236	ND	4960
296MW02	12/02/98	ND	9440	20100	26.4	82.7	ND	544
296MW02	02/19/99	ND	2110	6970	256	18	ND	84500
296MW02	06/25/99	ND	18500	38500	63.3	146	ND	19100
296MW02	09/20/99	ND	10600	31900	42.5	139	ND	9990
296MW02	12/27/99	ND	2780	12100	75.1	22.5	ND	29200
296MW02	03/23/00	ND	5270	11800	166	30.8	ND	121000
296MW02	06/28/00	ND	1250	13000	192	10.4	ND	179000
296MW02	6/28/00 D	ND	464	8890	113	5.53	ND	8180
296MW02	08/18/00	ND	4550	13100	46.8	42.1	ND	10900

Note:

Gray shading indicates exceedance of New Jersey
Ground Water Quality Criteria (GWQC) defined in
NJAC 7-9-6.

Abbreviations:

MW: Monitoring Well.

ND: Not Detected.

ug/L: Micrograms per liter.

D: Value from dilution.

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
BUILDING NO. 296
FORT MONMOUTH, NEW JERSEY

Well	Sample Date	Acetone	2-Butanone	Lead	di-n-Butyl phthalate	bis(2-Ethyl) hexyl phthalate)	Aluminum	Iron	Manganese	Chromium	Silver	Sodium
UNITS:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NJDEP CRITERIA		700	300	10	900	30	200	300	50	100	20	50000
0296MW03	11/22/95	ND	ND	ND	ND	ND	-	-	-	-	-	-
0296MW03	6/16/97	ND	ND	ND	1.26	ND	14	12500	19	ND	27	34000
0296MW03	8/19/97	ND	ND	2.2	ND	ND	643	3160	38	119	ND	37000
0296MW03	11/18/97	ND	ND	9.0	3.63	ND	1383	5446	20	13.7	ND	25170
0296MW03	2/26/98	ND	ND	15	1.15	1.16	1458	14030	121	13.7	ND	134200
0296MW03	5/18/98	ND	ND	6.0	ND	ND	1698	12940	25.1	28.4	ND	16650
0296MW03	8/21/98	6.18	ND	2.80	ND	ND	4550	16600	25.4	42.6	ND	21100
0296MW03	12/2/98	ND	ND	ND	ND	ND	828	4070	15.3	10.4	ND	20700
0296MW03	2/19/99	ND	ND	2.75	ND	ND	876	2810	17.4	8.65	ND	15800
0296MW03	6/25/99	ND	4.92	ND	ND	ND	1700	6680	32.0	17.9	ND	23200
0296MW03	9/20/99	ND	ND	ND	ND	ND	1390	3610	16.5	9.63	ND	18600
0296MW03	12/27/99	ND	ND	ND	ND	ND	503	2180	20.4	5.91	ND	19300
0296MW03	3/23/00	ND	ND	ND	ND	ND	352	450	29.4	ND	ND	10400
0296MW03	6/28/00	ND	ND	2.39	ND	ND	244	452	40.3	2.83	ND	32600
0296MW03	8/18/00	7.65	ND	2.37	ND	ND	336	162	84.6	0.747	ND	19600

Note:

Gray shading indicates exceedance of New Jersey
Ground Water Quality Criteria (GWQC) defined in
NJAC 7-9-6.

Abbreviations:

MW: Monitoring Well.

ND: Not Detected.

ug/L: Micrograms per liter.

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
BUILDING NO. 296
FORT MONMOUTH, NEW JERSEY

Well	Sample Date	Acetone	Lead	Benzene	Toluene	di-n-Butyl phthalate	Aluminum	Iron	Manganese	Chromium	Silver	Sodium
UNITS:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NJDEP CRITERIA		700	10	1	1000	900	200	300	50	100	20	50000
0296MMW04	11/22/95	ND	5.7	2.5	2.3	ND	-	-	-	-	-	-
0296MMW04	6/16/97	ND	ND	3.06	1.27	3.51	66	9400	186	ND	34	187600
0296MMW04	8/19/97	ND	10.5	ND	2.76	1.17	499	79700	2384	112	8	204000
0296MMW04	11/18/97	ND	11	ND	ND	1.92	309	18160	384	2.9	ND	598900
0296MMW04	2/26/98	ND	ND	ND	ND	2.95	1294	3816	27.8	9.4	ND	36550
0296MMW04	5/18/98	ND	8.5	ND	ND	ND	1065	16120	259	4.0	ND	53300
0296MMW04	8/21/98	13.32	ND	ND	ND	ND	386	39700	630	5.23	ND	1310000
0296MMW04	12/2/98	3.21	8.94	3.84	ND	ND	339	31200	961	16.1	ND	682000
0296MMW04	2/19/99	ND	10.4	ND	ND	ND	1080	21300	261	17.6	ND	786000
0296MMW04	6/25/99	7.63	3.60	2.36	1.19	ND	352	27500	637	8.19	ND	1560000
0296MMW04	9/20/99	ND	3.74	ND	ND	ND	325	42000	1160	9.82	ND	2840000
0296MMW04	12/27/99	ND	11.8	ND	ND	ND	925	22800	126	15.0	ND	402000
0296MMW04	3/23/00	ND	6.75	ND	ND	ND	2040	22800	256	26.3	ND	218000
0296MMW04	6/28/00	ND	5.37	ND	ND	ND	627	8490	75.1	14.1	ND	174000
0296MMW04	8/18/00	11.79	2.70	3.28	ND	ND	57.8	9180	184	9.25	ND	315000

Note:

Gray shading indicates exceedance of New Jersey Ground Water Quality Criteria (GWQC) defined in NJAC 7-9-6.

Abbreviations:

MW: Monitoring Well.

ND: Not Detected.

ug/L: Micrograms per liter.

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
BUILDING NO. 296
FORT MONMOUTH, NEW JERSEY

Well	Sample Date	Acenaphthene	Acetone	Lead	Benzene	Toluene	Pyridine	di-n-Butyl phthalate	Butyl benzyl phthalate	bis(2-Ethyl hexyl phthalate)	Naphthalene
UNITS:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NJDEP CRITERIA:		NLE	700	10	1	1000	NLE	900	100	30	NLE
0296MW06	11/29/94	ND	ND	5.1	12	ND	ND	ND	ND	ND	ND
0296MW06	11/22/95	ND	ND	-	24	1.1	ND	-	-	-	-
0296MW06	6/16/97	ND	ND	ND	ND	ND	ND	31	4.3	ND	19
0296MW06	8/19/97	ND	ND	1.5	ND	ND	ND	ND	ND	ND	6.83
0296MW06	11/18/97	ND	ND	8.0	ND	ND	189	2.85	ND	ND	96.26
0296MW06	2/26/98	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.95
0296MW06	5/18/98	ND	ND	ND	29.18	ND	ND	ND	ND	2.56	7.79
0296MW06	8/21/98	ND	10.51	ND	ND	ND	ND	ND	ND	ND	4.92
0296MW06	12/2/98	ND	ND	ND	9.45	ND	ND	ND	ND	ND	ND
0296MW06	2/19/99	ND	ND	2.47	ND	ND	ND	ND	ND	ND	ND
0296MW06	6/25/99	1.46	ND	ND	ND	ND	ND	ND	ND	ND	1.59
0296MW06	9/20/99	2.12	ND	ND	ND	ND	ND	ND	ND	ND	ND
0296MW06	12/27/99	2.50	ND	ND	1.40	ND	ND	ND	ND	ND	ND
0296MW06	3/23/00	1.62	ND	ND	ND	ND	ND	ND	ND	ND	12.01
0296MW06	6/28/00	2.50	ND	12.8	ND	ND	ND	ND	ND	ND	ND
0296MW06	8/18/00	3.83	7.68	2.10	ND	ND	ND	ND	ND	ND	ND

Note:

Gray shading indicates exceedance of New Jersey Ground Water Quality Criteria (GWQC) defined in NJAC 7:9-6.

Abbreviations:

MW: Monitoring Well.

ND: Not Detected.

ug/L: Micrograms per liter.

NLE: No limit established.

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
BUILDING NO. 296
FORT MONMOUTH, NEW JERSEY

Well	Sample Date	2-Methyl naphthalene	Dibenzofuran	Fluorene	Phenanthrene	Fluoranthene	Pyrene	Benzo (a) anthracene	4- Nitrophenol	Anthracene	Chrysene
UNITS:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NJDEP CRITERIA		NLE	NLE	300	NLE	300	200	20	NLE	2000	20
0296MW06	11/29/94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
0296MW06	11/22/95	-	-	-	-	-	-	-	-	-	-
0296MW06	6/16/97	12	8.1	10	12	3.4	2.9	1.0	ND	ND	1.4
0296MW06	8/19/97	5.67	8.32	10.58	7.73	4.96	2.31	ND	15.64	2.48	ND
0296MW06	11/18/97	62.29	26.84	29.40	30.89	4.69	2.96	ND	ND	30.02	ND
0296MW06	2/26/98	2.06	1.03	1.24	1.29	ND	ND	ND	ND	ND	ND
0296MW06	5/18/98	ND	4.57	5.57	6.95	2.09	1.36	ND	ND	1.43	ND
0296MW06	8/21/98	ND	4.47	ND	ND	ND	ND	ND	ND	ND	ND
0296MW06	12/2/98	ND	5.38	5.49	5.96	1.90	1.22	ND	ND	ND	ND
0296MW06	2/19/99	ND	2.20	3.18	3.61	3.24	1.93	ND	ND	1.24	ND
0296MW06	6/25/99	1.26	2.38	2.62	2.89	1.19	ND	ND	ND	ND	ND
0296MW06	9/20/99	ND	2.94	3.49	2.24	ND	ND	ND	ND	ND	ND
0296MW06	12/27/99	ND	3.47	3.78	1.53	ND	ND	ND	ND	ND	ND
0296MW06	3/23/00	ND	1.60	1.83	ND	ND	ND	ND	ND	ND	ND
0296MW06	6/28/00	ND	3.85	4.63	1.61	ND	ND	ND	ND	ND	ND
0296MW06	8/18/00	ND	4.36	6.58	4.53	2.17	1.56	ND	ND	ND	ND

Note:

Gray shading indicates exceedance of New Jersey
Ground Water Quality Criteria (GWQC) defined in NJAC
7:9-6.

Abbreviations:

MW: Monitoring Well.

ND: Not Detected.

ug/L: Micrograms per liter.

NLE: No limit established.

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
BUILDING NO. 296
FORT MONMOUTH, NEW JERSEY

Well	Sample Date	Acetone	Lead	Methylene Chloride	di-n-Butyl phthalate	Butyl benzyl phthalate	bis(2-Ethyl hexyl phthalate)	Aluminum	Iron	Manganese	Chromium	Silver	Sodium
UNITS:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NJDEP CRITERIA:		700	10	2	900	100	30	200	300	50	100	20	50000
0296MW08	11/8/94	ND	7.3	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
0296MW08	11/22/95	ND	ND	0.6	83	28	5.1	758	4570	163	ND	27	23600
0296MW08	11/22/95	ND	ND	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
0296MW08	6/16/97	ND	ND	ND	44	3.0	ND	1400	16000	88	ND	28	38000
0296MW08	8/18/97	ND	ND	ND	ND	ND	ND	255	17560	83	41	ND	41020
0296MW08	11/17/97	ND	18	ND	1.17	ND	ND	10260	9311	66	3.9	ND	31720
0296MW08	2/27/98	ND	37	ND	ND	ND	3.42	11740	30280	107	36	ND	25340
0296MW08	5/18/98	ND	6.8	ND	ND	ND	ND	7276	26310	75.4	ND	ND	24130
0296MW08	8/21/98	5.96	15.9	ND	ND	ND	ND	17800	56500	89.2	31.2	ND	20300
0296MW08	12/2/98	ND	4.78	ND	ND	ND	ND	1770	24100	75.3	1.89	ND	33900
0296MW08	2/19/99	ND	7.01	ND	ND	ND	ND	1900	12800	85.6	6.00	ND	35400
0296MW08	6/25/99	ND	2.95	ND	ND	ND	ND	1580	17200	51.5	5.29	ND	20500
0296MW08	9/20/99	ND	2.93	ND	ND	ND	ND	682	3260	31.4	2.81	ND	26000
0296MW08	12/27/99	ND	2.35	ND	ND	ND	ND	1270	9940	65.9	2.91	ND	34400
0296MW08	3/23/00	ND	ND	ND	ND	ND	ND	1080	11900	72.3	3.93	ND	28400
0296MW08	6/28/00	ND	17.7	ND	ND	ND	ND	1546	26000	77.6	6.57	ND	30600
0296MW08	8/18/00	8.56	15.9	ND	ND	ND	ND	2100	18000	59.6	3.42	ND	15800

Note:

Gray shading indicates exceedance of New Jersey Ground Water Quality Criteria (GWQC) defined in NJAC 7:9-6.

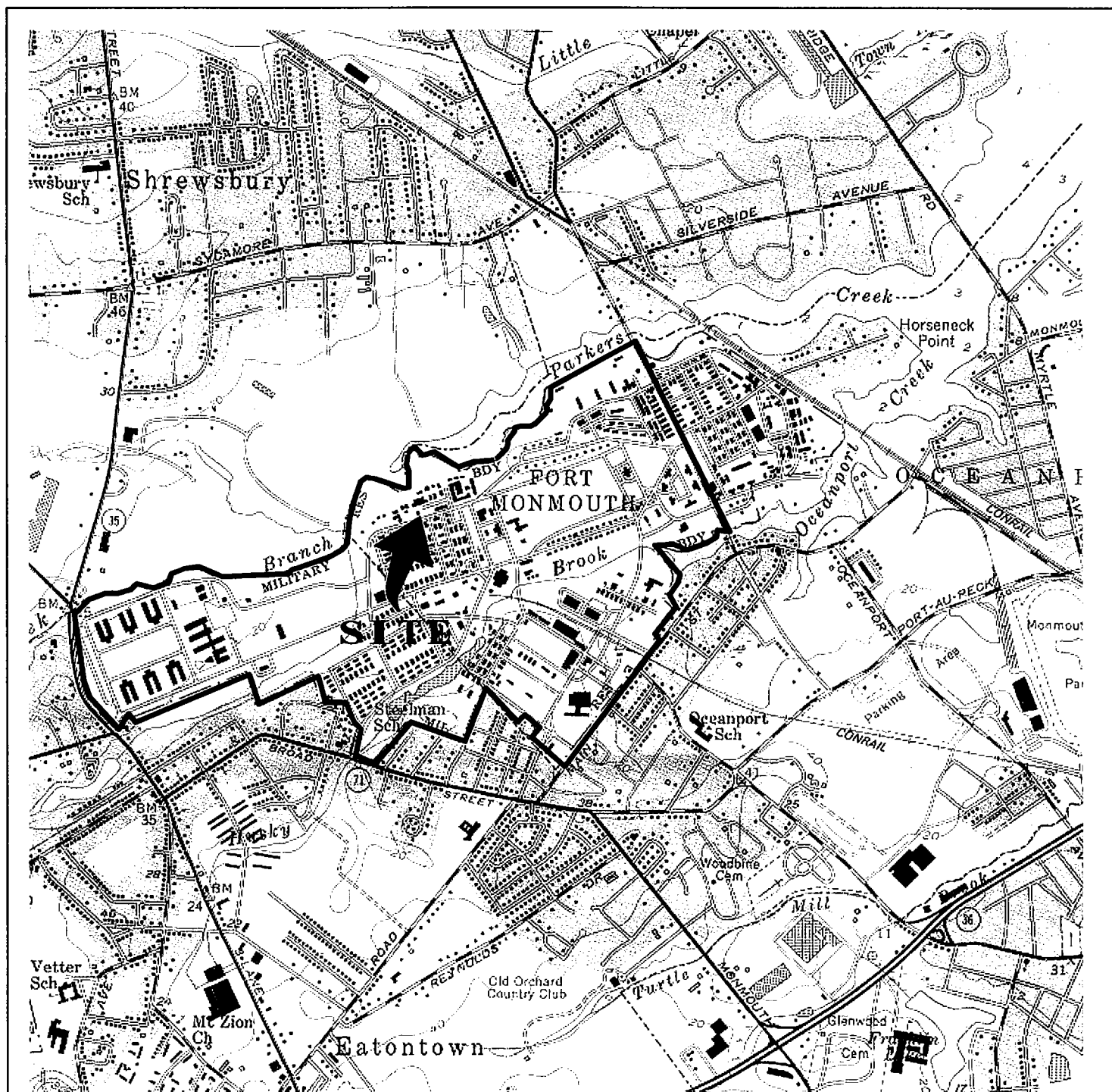
Abbreviations:

MW: Monitoring Well.

ND: Not Detected.

ug/L: Micrograms per liter.

FIGURES



LONG BRANCH, N. J.
40073-C8-TF-024

1954
PHOTOREVISED 1981
DMA 6164 I SE-SERIES V822



QUADRANGLE LOCATION

FIGURE 1

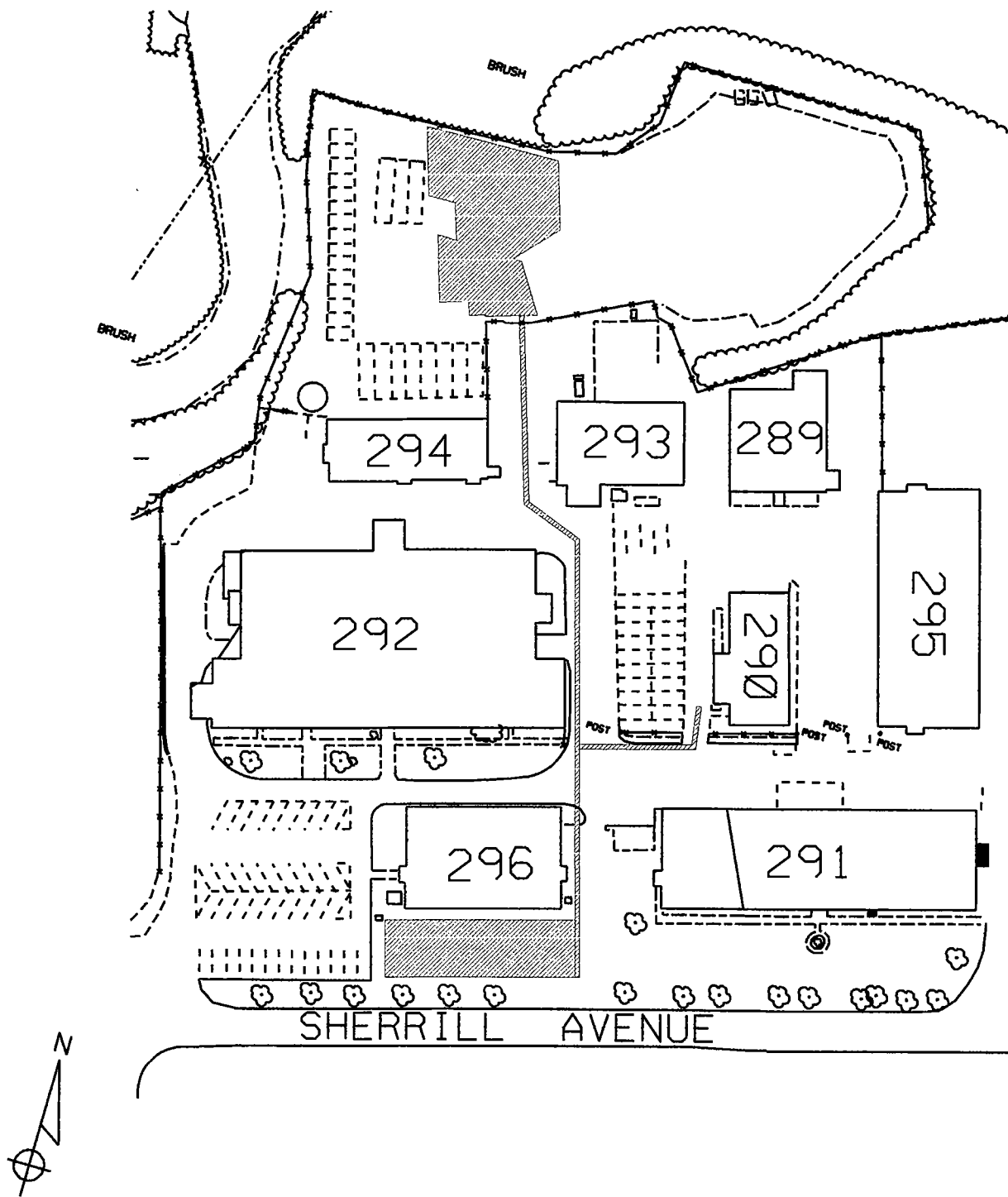
LOCATION MAP
Building 296
Main-Post West
Fort Monmouth Army Base
Monmouth County, NJ

VERSAR
Engineers, Managers, Scientists, & Planners
Bristol, PA

Scale: 1" = 2000'

Date: Nov., 1993

Mapped, edited and published by the Geological Survey



LEGEND



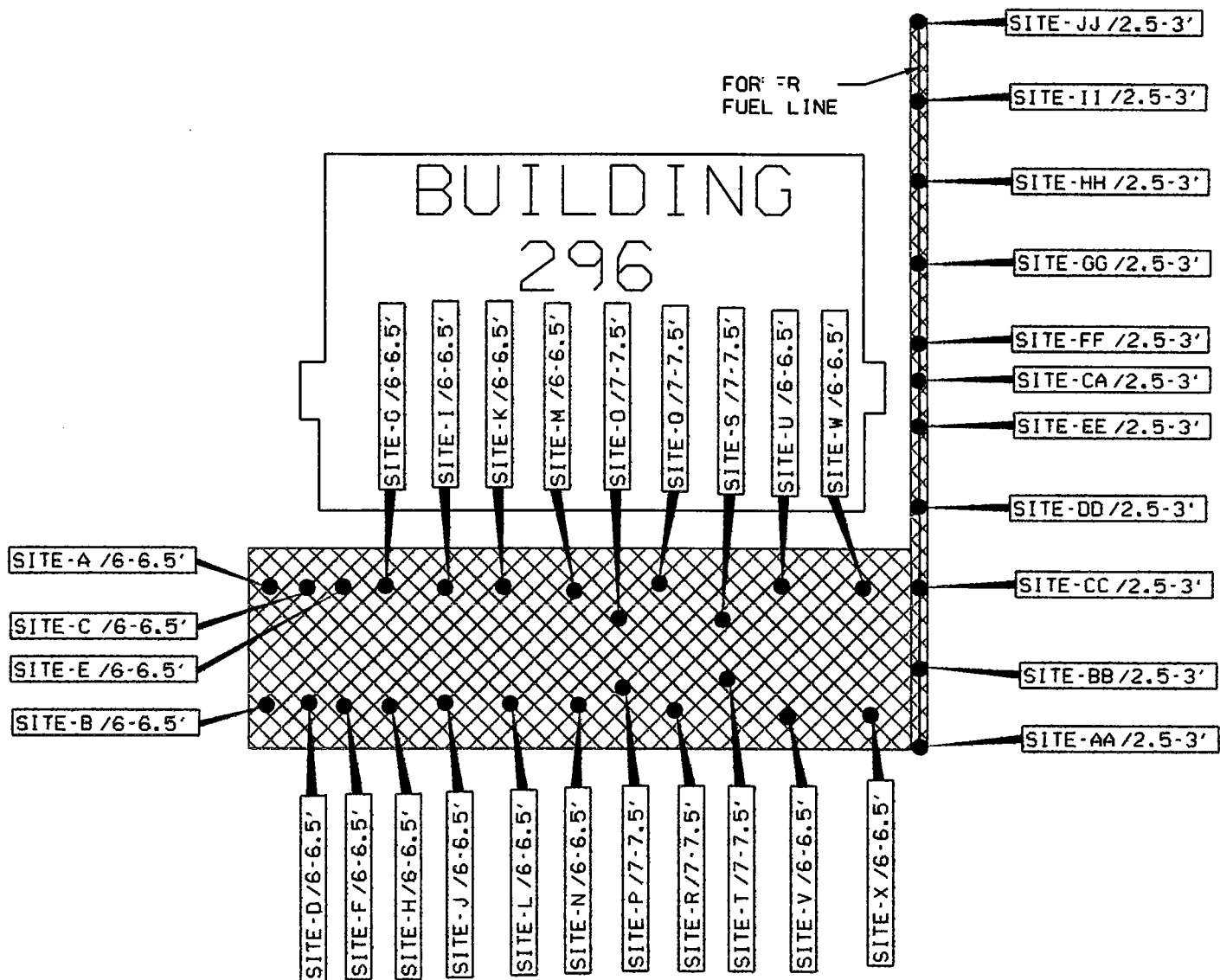
LIMIT OF EXCAVATION

FIGURE 2
SITE MAP
BUILDING 296
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
ENGINEERS, SCIENTISTS & PLANNERS
BRISTOL, PA.

SCALE: 1"=100'

DATE: NOV. 1993



LEGEND

● SOIL SAMPLE LOCATION
(NOVEMBER 5, 1993)

● SOIL SAMPLE LOCATION
(DECEMBER 9, 1993)

▨ LIMIT OF EXCAVATION
(NOVEMBER 5, 1993)

SITE-A /6-6.5' SAMPLE ID WITH DEPTH
OF SAMPLE (FEET BGS)

NOTES:

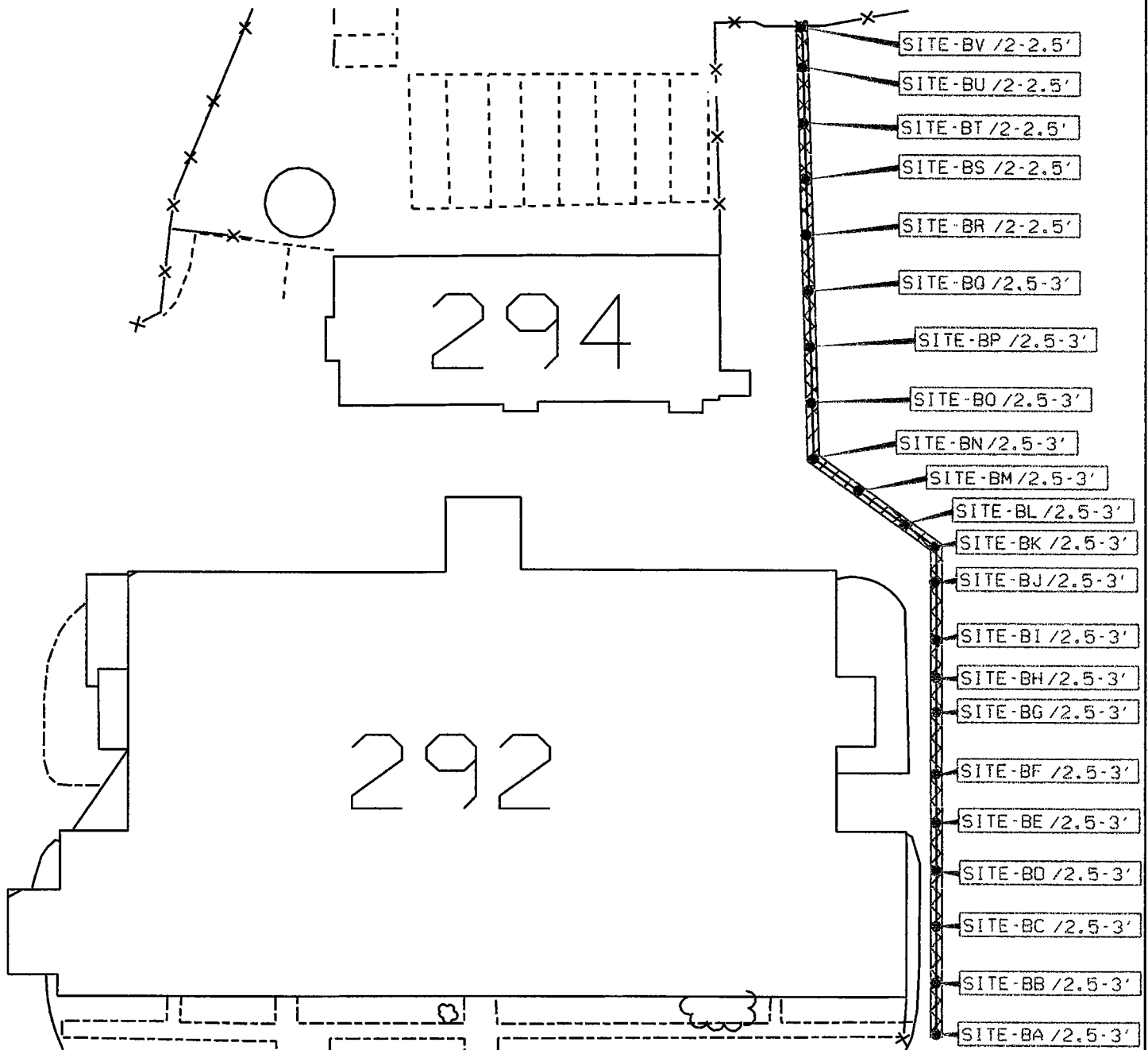
1. SEE TABLE 2 FOR THE TPHC RESULTS.
2. SEE TABLE 3 FOR THE VOC RESULTS.
3. SEE TABLE 4 FOR THE LEAD RESULTS.
4. BGS = BELOW GROUND SURFACE

FIGURE 3A
SOIL SAMPLING LOCATION MAP
BUILDING 296
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
ENGINEERS, SCIENTISTS & PLANNERS
BRISTOL, PA.

SCALE: 1" = 30'

DATE: NOV. 1993



LEGEND



SOIL SAMPLE LOCATION
(NOVEMBER 23, 1993)



LIMIT OF EXCAVATION
(NOVEMBER 23, 1993)

SITE-BA /2.5-3'

SAMPLE ID WITH
DEPTH (FEET BGS)

NOTES:

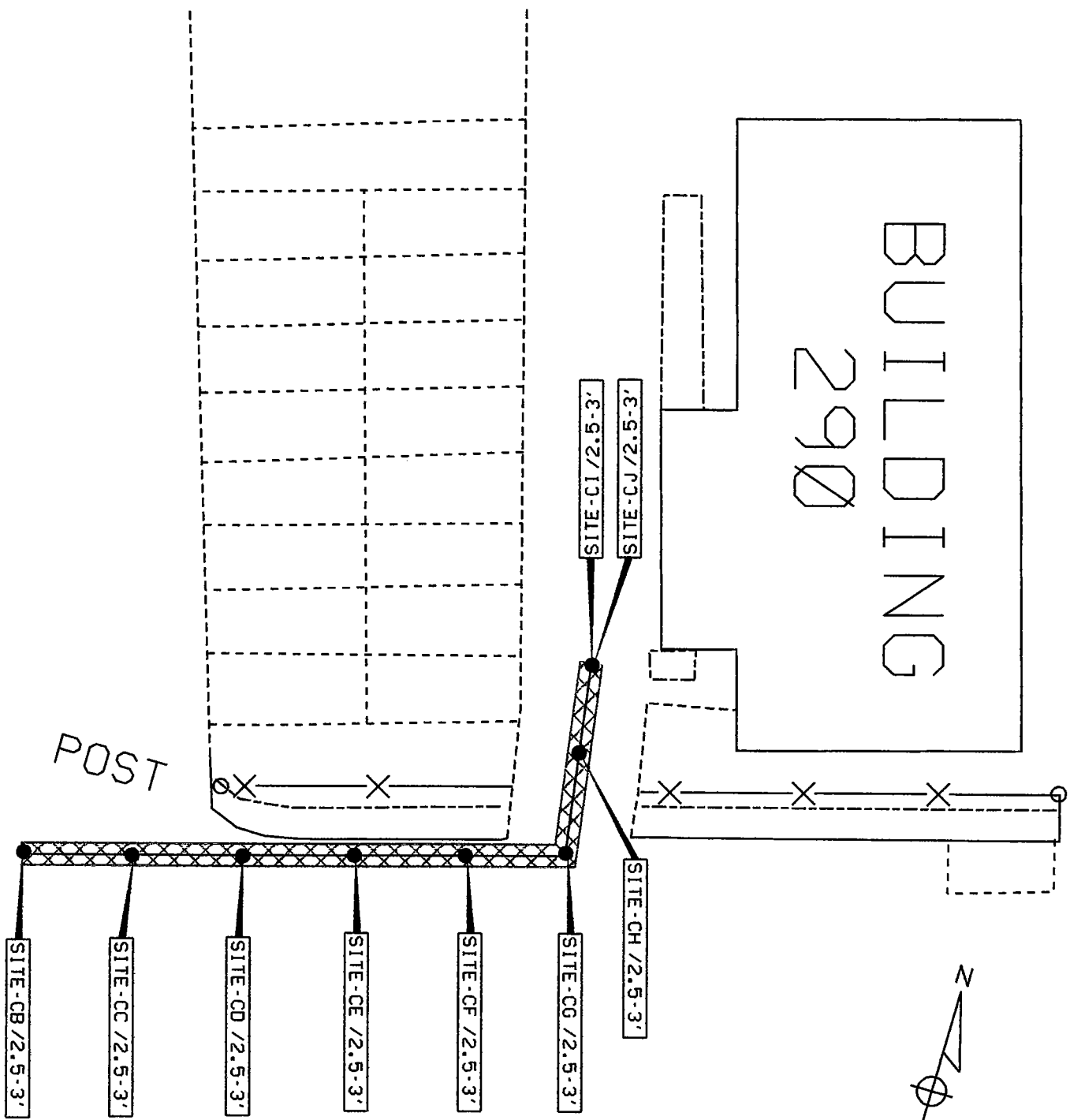
1. SEE TABLE 2 FOR THE TPHC RESULTS.
2. SEE TABLE 3 FOR THE VOC RESULTS.
3. SEE TABLE 4 FOR THE LEAD RESULTS.
4. BGS = BELOW GROUND SURFACE

FIGURE 3B
SOIL SAMPLING LOCATION MAP
BUILDING 296
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
ENGINEERS, SCIENTISTS & PLANNERS
BRISTOL, PA.

SCALE: 1" = 40'

DATE: NOV. 1993



LEGEND



SOIL SAMPLE LOCATION
(DECEMBER 9, 1993)



LIMIT OF EXCAVATION
(DECEMBER 9, 1993)

SITE-CB/2.5-3'

SAMPLE ID WITH DEPTH
OF SAMPLE (FEET BGS)

NOTES:

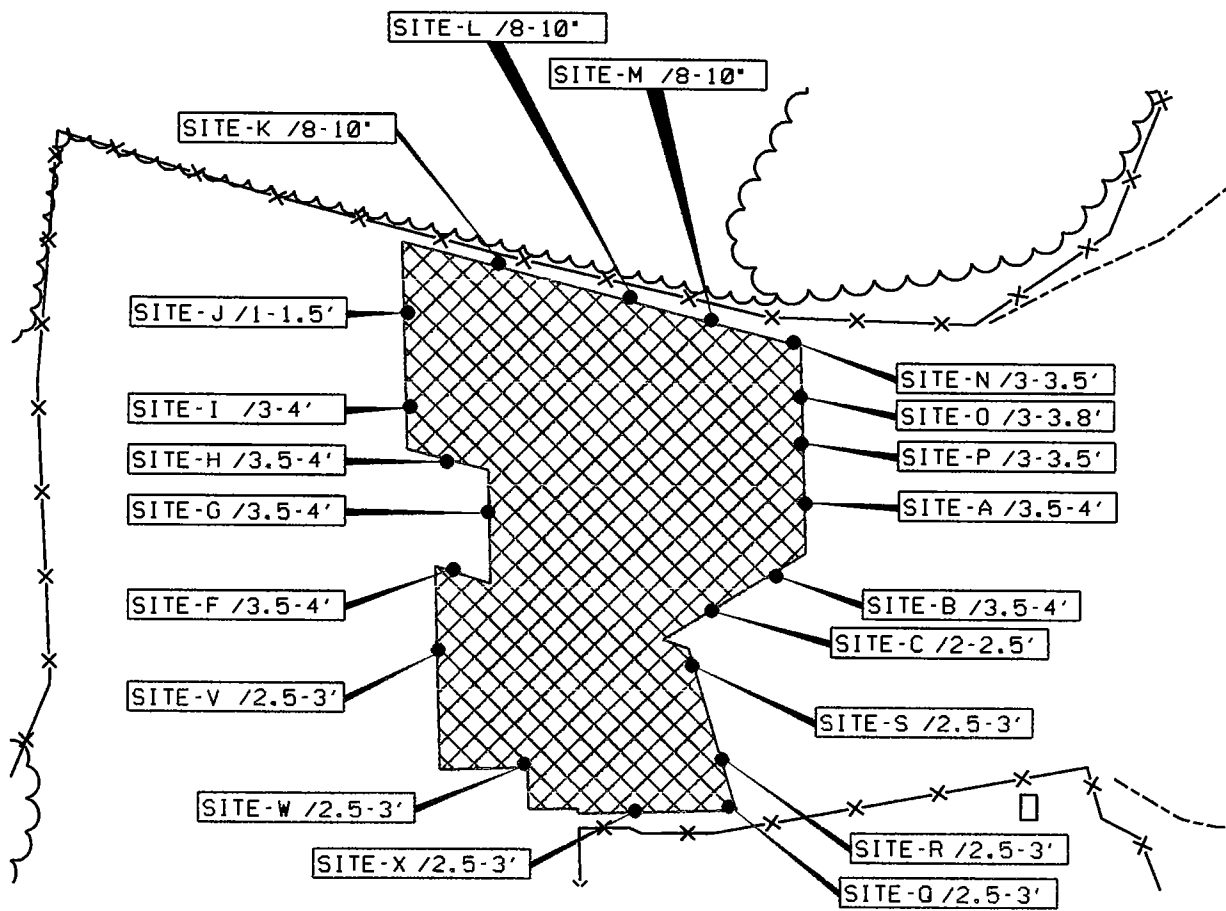
1. SEE TABLE 2 FOR THE TPHC RESULTS.
2. SEE TABLE 3 FOR THE VOC RESULTS.
3. SEE TABLE 4 FOR THE LEAD RESULTS.
4. BGS = BELOW GROUND SURFACE

FIGURE 3C
SOIL SAMPLING LOCATION MAP
BUILDING 296
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
ENGINEERS, SCIENTISTS & PLANNERS
BRISTOL, PA.

SCALE: 1" = 20'

DATE: NOV. 1993



LEGEND

- SOIL SAMPLE LOCATION (DECEMBER 29, 1993)
- SOIL SAMPLE LOCATION (JANUARY 5, 1994)
- ▨ LIMIT OF EXCAVATION (JANUARY 5, 1994)

SITE-Q /2.5-3' SAMPLE ID WITH DEPTH OF SAMPLE (FEET BGS)

NOTES:

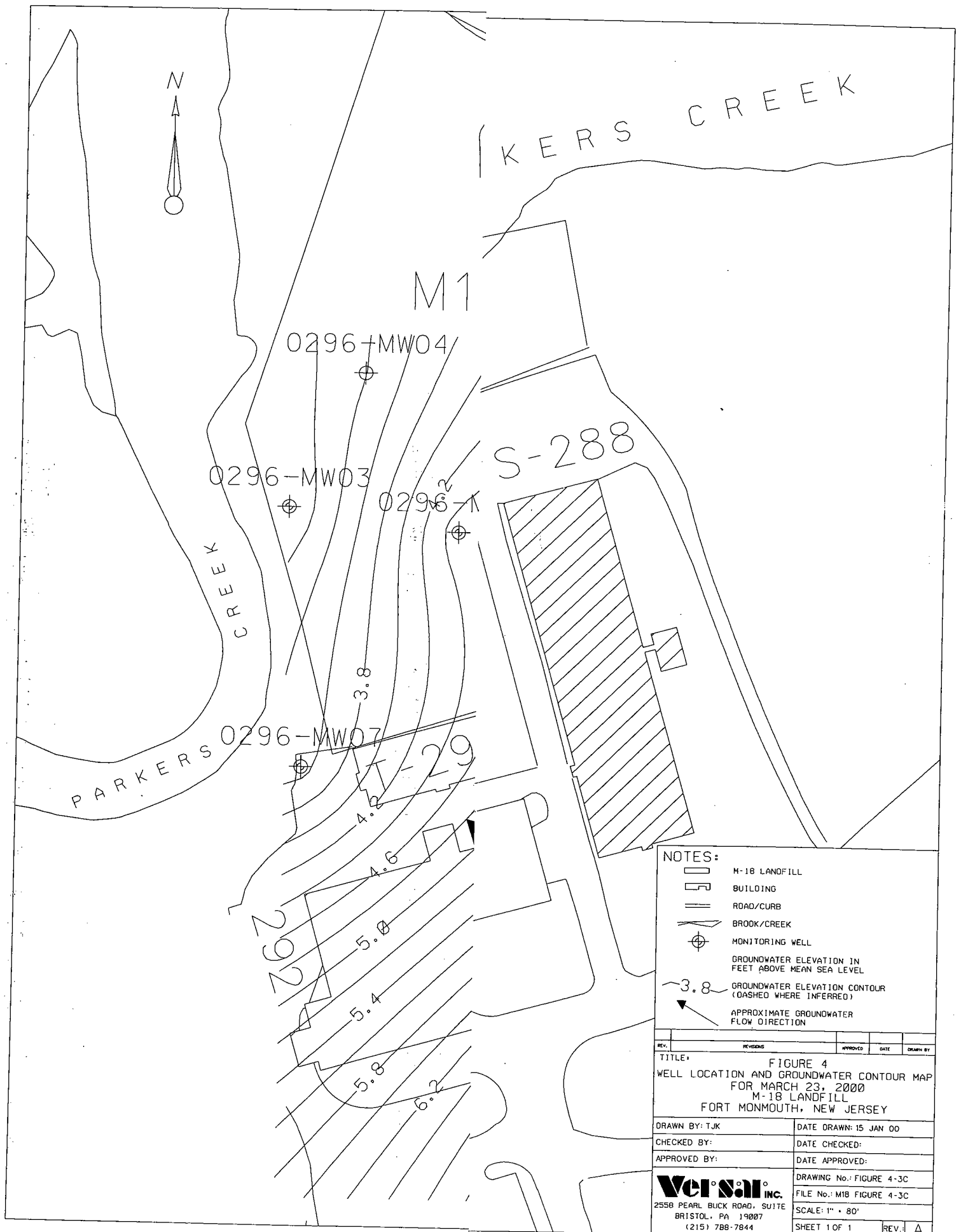
1. SEE TABLE 3 FOR THE VOC RESULTS.
2. SEE TABLE 4 FOR THE LEAD RESULTS.
3. BGS = BELOW GROUND SURFACE

FIGURE 3D
SOIL SAMPLING LOCATION MAP
BUILDING 296
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
ENGINEERS, SCIENTISTS & PLANNERS
BRISTOL, PA.

SCALE: 1" = 40'

DATE: NOV. 1993



APPENDIX A

NJDEP-STANDARD REPORTING FORM

APPENDIX B

SITE ASSESSMENT SUMMARY

APPENDIX C
WASTE MANIFEST

APPENDIX D

UST DISPOSAL CERTIFICATE

APPENDIX E

SOIL ANALYTICAL DATA PACKAGE

Attachment C – Boring Logs

Soil Boring Log

CLIENT: USACE					INSPECTOR: <u>C. Watson</u>		BORING/WELL ID: <u>M54-SB-01</u>	
PROJECT NAME: FTMM - ECP					DRILLER: <u>J. BARNIK</u>		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER: <u>80°F O.C.</u>		<u>M54</u>	
PROJECT NUMBER: 748810-					CONTRACTOR: East Coast Drilling, Inc. (ECDI)			
GROUNDWATER OBSERVATIONS					RIG TYPE: <u>Geoprobe® 7822DT</u>		LOCATION PLAN	
WATER LEVEL: <u>~1.5</u>					DATE/TIME START: <u>8/8/16 1215</u>		Oceanport, New Jersey	
DATE: <u>8/8/16</u>					DATE/TIME FINISH: <u>8/8/16 1225</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			<u>6/48</u>	<u>0</u>	0-20" moist, brown, loose, mt SAND, trace silt, trace f gravel			
1				<u>0</u>				
2				<u>0</u>	20"-26" saturated, brown, loose mt, SAND, trace silt			
3	<u>3.6-4</u> <u>3-3.5</u>			<u>3.7</u>	26"-36" saturated, blue gravel, trace C SAND			
4	<u>3.5-4</u>			<u>0</u>	36"-42" wet, dark gray/green/ orange mt mottled SAND, little silt			
5			<u>60/60</u>	<u>0</u>	0-60" SAA			
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 PROJECT NAME: FTMM - ECP PROJECT LOCATION: FTMM Parcel PROJECT NUMBER: 748810-					INSPECTOR: C. Watson DRILLER: J. BARNAK WEATHER: 80°F O.C. CONTRACTOR: East Coast Drilling, Inc. (ECDI)		BORING/WELL ID: 154-SB-02 LOCATION DESCRIPTION: Parcel 54 FTMM	
GROUNDWATER OBSERVATIONS WATER LEVEL: ~ 1 DATE: 8/8/16 TIME: MEAS. FROM:					RIG TYPE: Geoprobe(R) 7822DT DATE/TIME START: 1120 DATE/TIME FINISH: 1135 WEIGHT OF HAMMER: N/A DROP OF HAMMER: N/A TYPE OF HAMMER: N/A		LOCATION PLAN Oceanport, New Jersey	
DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS	
0			60/46	0	0-13" moist, Brown, M. Dense, MF SAND, little silt, trace f gravel			
1				0				
2				1.1	13"-23" saturated, Brown, M. Dense, MF SAND trace f gravel			
3				12.2				
4				54.8	23"-29" saturated, Brown, MC, SAND, some f gravel			
5				59.7				
6				NR	29"-46" saturated blue gravel			
7				NR				
8				48/42	6-12" SAA			
9				27.3	12"-26" Wet, blue Dark Brown f SAND and organics (wood fibers, roots), trace blue gravel			
10	6-6.5			42.9	20"-42" Wet organic material (wood fibers/roots), some silt, some f SAND			
11				6.8				
12				15.4				
13				2.1				
14				8.7				
15				NR				
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Remarks:

Sample Types

S - Split-Spoon
 U - Undisturbed Tube
 C - Rock Core
 A - Auger Cuttings

Consistency vs. Blowcount / Foot

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: <u>USACE</u> PROJECT NAME: <u>FTMM - ECP</u> PROJECT LOCATION: <u>FTMM Parcel</u> PROJECT NUMBER: <u>748810-</u> GROUNDWATER OBSERVATIONS WATER LEVEL: _____ DATE: _____ TIME: _____ MEAS. FROM: _____					INSPECTOR: <u>C. Winton</u> DRILLER: <u>J. BARNIX</u> WEATHER: <u>78°F O.C.</u> CONTRACTOR: <u>East Coast Drilling, Inc. (ECDI)</u> RIG TYPE: <u>Geoprobe(R) 7822DT</u> DATE/TIME START: _____ DATE/TIME FINISH: _____ 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>M54-SB-02</u> LOCATION DESCRIPTION LOCATION PLAN <u>Oceanport, New Jersey</u>																
DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS																
<u>08</u>			<u>69/50</u>	<u>6.8</u>	<u>0-32" SAA</u>																		
				<u>14.2</u>																			
<u>09</u>				<u>6.1</u>	<u>32"-46" Wet, green, mf, soft</u>																		
				<u>5.4</u>	<u>SAND, some silt</u>																		
<u>10</u>				<u>10.2</u>	<u>46"-52" Wet, green and orange</u>																		
				<u>0.4</u>	<u>mf, m. dense SAND,</u>																		
<u>11</u>	<u>11-11.5</u>			<u>0</u>	<u>little silt</u>																		
				<u>0</u>																			
<u>12</u>				<u>NR</u>																			
				<u>NR</u>																			
<u>13</u>																							
<u>6</u>																							
<u>7</u>																							
<u>8</u>																							
<u>9</u>																							
<u>0</u>																							
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;"> <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																				
					sand - 35-50% silt - 20-35% clay - 10-20% trace - <10% moisture, density, color, gradation																		

Soil Boring Log

CLIENT: USACE		INSPECTOR: C. Watson	BORING/WELL ID: M54-SB-03
PROJECT NAME: FTMM - ECP		DRILLER: J. BARNAK	LOCATION DESCRIPTION
PROJECT LOCATION: FTMM Parcel		WEATHER: 80°F O.C.	M54
PROJECT NUMBER: 748810-		CONTRACTOR: East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS		RIG TYPE: Geoprobe(R) 7822DT	LOCATION PLAN
WATER LEVEL: w surface		DATE/TIME START: 1420	Oceanport, New Jersey
DATE:		DATE/TIME FINISH: 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			60/54	0	0-14" saturated, light brown, mf SAND, trace silt, trace f gravel		
1				0	14"-30" saturated, f blue gravel		
2				1.2	30"-54" wet, organic material (wood fiber/roots), some silt, brown, soft		
3				4.6			
4				6.8			
5				1.3			
6				0.7			
7				1.8			
8				0.3			
9				60/60	0-28" saturated, f gravel and coarse sand, dark grey		
10				4.5	28"-55" wet, organics and silt, brown, soft		
11				60.6	55"-60" wet, dark grey, mf m. fine SAND, little silt		
12				23.8			
13				11.0			
14				13.8			
15				0.3			
16				4.7			
17				0			
18				0			
19							
20							

Remarks:

Sample Types

S - Split-Spoon
 U - Undisturbed Tube
 C - Rock Core
 A - Auger Cuttings

Consistency vs. Blowcount / Foot

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: <i>LEE P. J.</i>		BORING/WELL ID: <i>M54-SB-03</i>
PROJECT NAME: FTMM - ECP		DRILLER: <i>LEE P. J.</i>		LOCATION DESCRIPTION
PROJECT LOCATION: FTMM Parcel		WEATHER: <i>LEE P. J.</i>		
PROJECT NUMBER: 748810-		CONTRACTOR: East Coast Drilling, Inc. (ECDI)		
GROUNDWATER OBSERVATIONS		RIG TYPE: Geoprobe(R) 7622DT		LOCATION PLAN
WATER LEVEL: _____		DATE/TIME START: _____		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
<i>1</i> ₀			<i>60/60</i>	<i>10.6</i>	<i>0-8" SAA</i>		
				<i>4.5</i>			
<i>1</i> ₁				<i>0</i>	<i>8"-18" Wet, Brown, soft organics and silt</i>		
				<i>1.1</i>			
<i>1</i> ₂				<i>0</i>	<i>18"-30" Wet, Dark grey, f</i>		
				<i>0.8</i>	<i>sand and silt, little</i>		
<i>1</i> ₃				<i>0</i>	<i>f organics, trace</i>		
				<i>0</i>	<i>f gravel</i>		
<i>1</i> ₄				<i>0</i>	<i>30-66" Wet, gray/green, soft</i>		
				<i>0</i>	<i>nf SAND, little silt,</i>		
<i>1</i> ₅				<i>0</i>	<i>trace f gravel</i>		
<i>6</i>							
<i>7</i>							
<i>8</i>							
<i>9</i>							
<i>0</i>							

Remarks:

Sample Types

S - Split-Spoon
 U - Undisturbed Tube
 C - Rock Core
 A - Auger Cuttings

Consistency vs. Blowcount / Foot

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: C. WATSON		BORING/WELL ID: M54-SB-04	
PROJECT NAME: FTMM - ECP					DRILLER: J. BARNAK		LOCATION DESCRIPTION	
PROJECT LOCATION: FTMM Parcel					WEATHER: 80°F		Permit 54	
PROJECT NUMBER: 748810-					CONTRACTOR: East Coast Drilling, Inc. (ECDI)			
GROUNDWATER OBSERVATIONS					RIG TYPE: Geoprobe(R) 7822DT		LOCATION PLAN	
WATER LEVEL: ~1.5					DATE/TIME START: 1330 8/8		Oceanport, New Jersey	
DATE:					DATE/TIME FINISH: 1345 8/8			
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			69/52	0	0-18" moist, Brown, M. Dense MF SAND, trace silt, trace organics, trace f gravel			
1					18"-22" Saturated, SAA			
2	2.5-3				22"-28" Saturated blue gravel			
3					28"-40" Saturated, Dark Brown/gray MC SAND, little silt			
4	4.5-5				40-52" Wet, green/brown/gray MF mottled SAND, little silt			
5		69/60		0	0-11" SAA			
6					11"-60" Wet, Dark gray, M. Dense MF SAND, trace silt, trace f organics @ 54"			
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% somo - 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: C. Watson DRILLER: J. Burnak WEATHER: 80°F O.C. CONTRACTOR: East Coast Drilling, Inc. (ECDI)		BORING/WELL ID: M54-SB-05 LOCATION DESCRIPTION: M54	
GROUNDWATER OBSERVATIONS WATER LEVEL: ~3.5 DATE: _____ TIME: _____ MEAS. FROM: _____					RIG TYPE: Geoprobe(R) 7822DT DATE/TIME START: 8/8/16 1445 DATE/TIME FINISH: 8/8/16 1500 WEIGHT OF HAMMER: N/A DROP OF HAMMER: N/A TYPE OF HAMMER: N/A		LOCATION PLAN Oceanport, New Jersey	
DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS	
0			60/41	0	0-16" moist, loose, Brown, mf SAND, trace silt			
1					16"-49" moist, m. dense, orange/Brown, mf SAND, trace silt			
2					Saturated @ 40"			
3	3-3.5							
4								
5	5-5.5		60/60	0	0-25" SAA			
6					25-60" moist, gray/green, mf SAND, trace silt & gravel			
7								
8								
9								
10								
Remarks:								
Sample Types					Consistency vs. Blowcount / Foot			
S -- Split-Spoon U -- Undisturbed Tube C -- Rock Core A -- Auger Cuttings					Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
					V. Loose: 0-4 Dense: 30-50 Loose: 4-10 V. Dense: >50 M. Dense: 10-30	V. Soft: <2 Stiff: 8-15 Soft: 2-4 V. Stiff: 15-30 M. Stiff: 4-8 Hard: >30	and - 35-50% some - 20-35% little - 10-20% trace - <10% moisture, density, color, gradation	

Soil Boring Log

CLIENT: <u>USACE</u> PROJECT NAME: <u>FTMM</u> PROJECT LOCATION: <u>FTMM 54</u> PROJECT NUMBER: <u>748810-</u>					INSPECTOR: <u>K. McMullen</u> DRILLER: <u>Mike</u> WEATHER: _____ CONTRACTOR: <u>Cascade</u>		BORING/WELL ID: <u>M54-SB-06</u> LOCATION DESCRIPTION: _____ LOCATION PLAN: _____ Oceanport, New Jersey																
GROUNDWATER OBSERVATIONS WATER LEVEL: <u>~ 3'</u> DATE: <u>1/9/17</u> TIME: _____ MEAS. FROM: _____					RIG TYPE: <u>Geoprobe(R) 7822DT</u> DATE/TIME START: <u>0940 1/9/17</u> DATE/TIME FINISH: <u>0958 1/9/17</u> WEIGHT OF HAMMER: <u>N/A</u> DROP OF HAMMER: <u>N/A</u> TYPE OF HAMMER: <u>N/A</u>																		
DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS																
<u>0</u>			<u>60/36</u>	<u>0</u>	<u>0-1</u> dry, light brown, f-m sand, trace silt																		
<u>1</u>				<u>0</u>	<u>1-1.3</u> - light brown, f-m wet sand																		
<u>2</u>				<u>0</u>																			
<u>3</u>					<u>1.4-2</u> - blue stone, some f-m sand		<u>▽</u> 3ft																
<u>4</u>																							
<u>5</u>			<u>60/30</u>		<u>5-6</u> - blue stone f-m sand																		
<u>6</u>	<u>* SB-06-0-6-5</u>				<u>6-7.5</u> sand, wet, f-c dense. some sub ang gravel																		
<u>7</u>																							
<u>8</u>																							
<u>9</u>																							
<u>10</u>																							
Remarks: <u>* ran for analysis</u>																							
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;"> <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 PROJECT NAME: FTMM PROJECT LOCATION: FTMM Parcel M54 PROJECT NUMBER: 748810-07100 GROUNDWATER OBSERVATIONS WATER LEVEL: ~10' DATE: 11/10/17 TIME: MEAS. FROM:					INSPECTOR: Kevin McMulla DRILLER: Nick WEATHER: 30F, clear. CONTRACTOR: Cascade RIG TYPE: Geoprobe(R) 7822DT DATE/TIME START: 1137 / 11-10-17 DATE/TIME FINISH: 1200 / 11-10-17 WEIGHT OF HAMMER: N/A DROP OF HAMMER: N/A TYPE OF HAMMER: N/A		BORING/WELL ID: M54-SB-07 LOCATION DESCRIPTION: LOCATION PLAN: Oceanport, New Jersey																		
DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS																		
0			60/36		surface = grass + soil		offset 2ft to the East of original SB-07 location																		
				0	0-1.5 - dry brown f-m sand trace silt																				
1				0	1.5-1.8 - dry, brown, f-m sand some fill (gravel, coal)																				
2				0	1.8-2.0 - moist, brown, f-m sand, dense, some silt, trace sub ang gravel																				
3				0	2-3 dark brown, moist f-m sand, some silt trace clay																				
4			NR																						
5			60/36		5-6 moist, gray brown, f-c sand, some silt some sub ang gravel																				
6				0	6-7 moist, orange/brown, f-m sandy some silt, trace sub ang gravel																				
7				0	7-8 gray/brown, moist, f-m sandy some silt, trace clay, trace sub ang gravel moderate petrol odor																				
SB-07 - 7.5-8.0			3.3																						
8				5.8																					
9			NR																						
10			NR				▽ 10ft																		
Remarks: ** hold + extract samples																									
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;"> <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: 8-16</td> </tr> <tr> <td>Loose: 4-10</td> <td>V. Dense: >50</td> <td>Soft: 2-4</td> <td>V. Stiff: 16-30</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: 8-16	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 16-30	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: 8-16																						
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 16-30																						
M. Dense: 10-30		M. Stiff: 4-8	Hard: >30																						

Soil Boring Log

CLIENT: USACE PROJECT NAME: FTMM PROJECT LOCATION: FTMM Area MS4 PROJECT NUMBER: 748810-07100					INSPECTOR: Kevin McMullen DRILLER: Nick WEATHER: 30F, clear CONTRACTOR: Cascade		BORING/WELL ID: MS4-SB-07 LOCATION DESCRIPTION:	
GROUNDWATER OBSERVATIONS WATER LEVEL: _____ DATE: _____ TIME: _____ MEAS. FROM: _____					RIG TYPE: Geoprobe(R) 7822DT DATE/TIME START: 1137 / 1-10-17 DATE/TIME FINISH: 1200 / 1-10-17 WEIGHT OF HAMMER: N/A DROP OF HAMMER: N/A TYPE OF HAMMER: N/A		LOCATION PLAN Oceanport, New Jersey	
DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS	
1.0			60/60	1.9	10-12 wet gray brown f-m sand, some silt trace clay, trace sub angular gravel moderate petrol odor			
1.1				6.4				
1.2				3.1				
1.3				3.2				
1.4				3.3				
1.5				2.7	12-15 wet, black, stiff, peat some silt, slight sulfur odor			
1.6				1.0				
1.7				0.1				
1.8				0.1				
1.9								
2.0					EOB @ 15' bgs filled w/ cuttings topped w/ bentonite			

Remarks: ** extract + HOLD

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