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

11 April 2018

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

SUBJECT: UST 142B Site Investigation Report
Request for Unrestricted Use, No Further Action Approval
Fort Monmouth, Monmouth County, Oceanport, New Jersey
PI G000000032

Dear Mr. Joshi:

The U.S. Army Fort Monmouth (FTMM) Team prepared this Site Investigation (SI) Report to summarize existing file information and present the results of additional field sampling at Underground Storage Tank (UST) 142B (**Figure 1**), located in Parcel 79.

Background

UST 142B (Registration ID No. 090010-73) was a steel 550-gallon No. 2 fuel oil tank that was removed in July 1994 along with approximately 30 cubic yards of contaminated soil (Attachment H of Reference 9 of **Attachment A)**. Based on an inspection of the UST and field screening, the Army concluded that a discharge had occurred. A spill was reported and Spill Case No. 94-7-21-1564-45 was assigned on 21 July 1994. Post excavation soil sampling along the sidewalls of the excavation was completed on 21 July 1994. The samples were collected at a depth of 5.5 feet (ft) below ground surface (bgs) and analyzed for Total Petroleum Hydrocarbon (TPH) (Attachment H in Reference 9 of **Attachment A**). All post-excavation samples were below the then current cleanup criteria of 10,000 milligrams/kilogram (mg/kg).

In 2015, the New Jersey Department of Environmental Protection (NJDEP) requested additional groundwater sampling from a location placed within a distance sufficient to allow for adequate evaluation of UST 142B (Reference 3 of **Attachment A**). In 2016, the Army performed additional groundwater sampling from one temporary well (PAR-79-142-TMW-01) immediately downgradient of UST 142B (Figure 4 and Table 1 in Reference 4 of **Attachment A**). Multiple polynuclear aromatic hydrocarbons (PAHs) were detected in the groundwater samples at concentrations that exceeded the NJDEP Ground Water Quality Criteria (GWQC). These exceedances were attributed to sample turbidity rather than a release of fuel oil constituents to groundwater. NJDEP recommended additional sampling using a method to reduce turbidity (Reference 3 of **Attachment A).** A Work Plan was subsequently developed and approved by NJDEP in October 2017 (Reference 1 of **Attachment A**).

Recent Investigation Results

To address the data need described above, one permanent monitoring well (PAR-79-142B-MW-01) was installed, developed, and sampled at the former UST 142B tank location (**Figure 2**). The well was installed with a Geoprobe boring and was completed with a 10 foot well screen from approximately 2 ft bgs to approximately 12 ft bgs. The groundwater sample was collected at 9.7 ft bgs. Field notes and the well log are provided in **Attachment B** and **Attachment C**. The sample was analyzed for Volatile Organic Compounds (VOCs) and Semi-Volatile Organic Compounds (SVOCs) in accordance with the NJAC 7:26E requirements for No. 2 fuel oil (**Table 1**). There were no exceedances of the NJDEP GWQC. The results confirmed that the PAH exceedances of the NJDEP GWQC in the temporary monitoring well sampled in 2016 were attributed to sample turbidity rather than a release of fuel oil constituents to groundwater.

Summary

An Unrestricted Use, NFA determination is requested for UST 142B. Thank you for reviewing this request; we look forward to your approval and/or comments. Our technical Point of Contact is Kent Friesen at (732) 383-7201; kent.friesen@parsons.com. I can be reached at (732) 380-7064; william.r.colvin18.civ@mail.mil.

Sincerely,

William R Colvin

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

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

Figures:

Figure 1 UST 142B Site Location
Figure 2 UST 142B Site Layout and Sampling Locations

Tables:

Table 1 – 2018 Ground Water Sampling Results – Comparison to NJDEP Ground Water Quality Criteria

Attachments:

A. UST 142B Correspondence

1. New Jersey Department of Environmental Protection (NJDEP). 2017. Letter to the Army, *Supplemental Unregulated Heating Oil Tank (UHOT) Work Plan, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. October 13.
2. Department of the Army. 2017. *Supplemental Unregulated Heating Oil Tank (UHOT) Work Plan, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. August 15.
3. New Jersey Department of Environmental Protection. 2017. Letter to the Army, *RE: Request for No Further Action at Multiple Parcel 79 Storage Tanks Site Investigation Report Addendum, Fort Monmouth, New Jersey.* Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. May 8.
4. Department of the Army. 2016. *Request for No Further Action at Multiple Parcel 79 Storage Tanks Site Investigation Report Addendum, Fort Monmouth, New Jersey.* Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. February 8.
5. New Jersey Department of Environmental Protection (NJDEP). 2016. Letter to the Army, *RE: Response to NJDEP's August 25, 2015 Comments on the April 2015 Underground Storage Tanks Within ECP Parcel 79 and Work Plan Addendum for Former Storage Sites. Fort Monmouth, Oceanport, Monmouth County*. March 30.
6. Department of the Army. 2016. *Response to NJDEP's August 25, 2015 Comments on the April 2015 Underground Storage Tanks Within ECP Parcel 79. Fort Monmouth, Oceanport, Monmouth County*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. February 10.
7. New Jersey Department of Environmental Protection (NJDEP). 2016. Letter to the Army, *RE: Response to NJDEP's August 25, 2015 Comments on the April 2015 Underground Storage Tanks Within ECP Parcel 79 and Work Plan Addendum for Former Storage Sites. Fort Monmouth, Oceanport, Monmouth County*. March 30.
8. New Jersey Department of Environmental Protection (NJDEP). 2015. Letter to the Army, *RE: Underground Storage Tanks Within ECP Parcel 79 dated April 2015. Fort Monmouth, Oceanport, Monmouth County*. August 25.
9. Department of the Army. 2015. *Underground Storage Tanks Within ECP Parcel 79. Fort Monmouth, Oceanport, Monmouth County*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. April 22.

B. Field Notes

C. Boring Logs

New Jersey Department of Environmental Protection
Site Remediation Program

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

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

Document:

- "UST 142B Site Investigation Report, Request for Unrestricted Use, No Further Action Approval, Fort Monmouth, Monmouth County, Oceanport, New Jersey" (11 April 2018)

PERSON RESPONSIBLE FOR CONDUCTING THE REMEDIATION INFORMATION AND CERTIFICATION

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

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

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

Signature: William R Colvin Date: 11 April 2018

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

Completed form should be sent to:

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

FIGURES

Figure 1 –UST 142B Location

Figure 2 – UST 142B Site Layout and Sampling Locations

Little Silver Borough

Shrewsbury Borough

Tinton Falls Borough

Eatontown Borough

Oceanport Borough

West Long Branch Borough

UST142B

Parkers Creek

North Branch Parkers Creek

Lafetra Creek

Mill Creek

Husky Brook (Culvert)

Oceanport Creek

Wampum Lake

Wampum Brook

Husky Brook

Turtle Mill Brook

LEGEND:

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

N

1 inch = 1,000 feet

0 500 1,000 2,000 Feet

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

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

UST142B SITE LOCATION

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

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2018 Reports\UST 142B\FIGURE 1.mxd 2/20/2018 10:59:16 AM

LEGEND:

- Permanent Monitoring Well
- Groundwater Sample (2016)
- Former UST Location
- Estimated Groundwater Flow Direction
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line

N

1 inch = 40 feet

0 20 40 80 Feet

Source: FTMM Supplied CAD, 2013; U.S. Army BRAC, 2008; 2008 SI Report; USGS NHD, 2012.

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
UST 142B SITE LAYOUT AND SAMPLING LOCATION	
CREATED BY: RR	REVIEWED BY: KF
DATE: APR. 2018	FIGURE NUMBER: FIGURE 2
PROJECT NUMBER: 748810-06031	FILE: FIGURE 2.mxd

C:\Projects\FTMM\MXD\UST142B\FIGURE 2.mxd

TABLES

Table 1 – 2018 Ground Water Sampling Results – Comparison to NJDEP Ground Water Quality Criteria

TABLE 1
GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GROUND WATER QUALITY CRITERIA
SITE PARCEL 79 142 UST
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-79-142B-MW-01
Sample ID		PAR-79-142B-GW-MW-01-9.7
Sample Date		1/17/2018
Sample Round		
Filtered		Total
Volatile Organic Compounds (µg/l)		
1,1,1,2-Tetrachloroethane	1	< 0.75 UJ
1,1,1-Trichloroethane	30	< 0.75 UJ
1,1,2,2-Tetrachloroethane	1	< 0.75 UJ
1,1,2-Trichloroethane	3	< 0.75 UJ
1,1-Dichloroethane	50	< 0.75 UJ
1,1-Dichloroethene	1	< 0.75 UJ
1,1-Dichloropropene	100	< 0.75 UJ
1,2,3-Trichlorobenzene	100	< 0.75 UJ
1,2,3-Trichloropropane	0.03	< 2.5 UJ
1,2,4-Trichlorobenzene	9	< 0.75 UJ
1,2,4-Trimethylbenzene	100	< 0.75 UJ
1,2-Dibromo-3-chloropropane	0.02	< 2.5 UJ
1,2-Dibromoethane	0.03	< 0.75 UJ
1,2-Dichlorobenzene	600	< 0.75 UJ
1,2-Dichloroethane	2	< 0.75 UJ
1,2-Dichloropropane	1	< 0.75 UJ
1,3,5-Trimethylbenzene	100	< 0.75 UJ
1,3-Dichlorobenzene	600	< 0.75 UJ
1,3-Dichloropropane	100	< 0.75 UJ
1,4-Dichlorobenzene	75	< 0.75 UJ
2,2-Dichloropropane	100	< 0.75 UJ
2-Chlorotoluene	100	< 0.75 UJ
Acetone	6,000	< 3.8 UJ
Benzene	1	< 0.75 UJ
Bromobenzene	100	< 0.75 UJ
Bromochloromethane	100	< 0.75 UJ
Bromodichloromethane	1	< 0.75 UJ
Bromoform	4	< 0.75 UJ
Carbon tetrachloride	1	< 0.75 UJ
Chlorobenzene	50	< 0.75 UJ
Chlorodibromomethane	1	< 0.75 UJ
Chloroethane	5	< 0.75 UJ
Chloroform	70	< 0.75 UJ
Cis-1,2-Dichloroethene	70	< 0.75 UJ
Cis-1,3-Dichloropropene	1	< 0.75 UJ
Cymene	100	< 0.75 UJ
Dichlorodifluoromethane	1,000	< 0.75 UJ
Ethyl benzene	700	< 0.75 UJ
Hexachlorobutadiene	1	< 3.8 UJ
Isopropylbenzene	700	< 0.75 UJ
Meta/Para Xylene	1,000	< 1.5 UJ
Methyl bromide	10	< 0.75 UJ
Methyl butyl ketone	300	< 3.8 UJ
Methyl chloride	100	< 0.75 UJ
Methyl ethyl ketone	300	< 3.8 UJ
Methyl isobutyl ketone	100	< 3.8 UJ
Methyl Tertbutyl Ether	70	< 0.75 UJ
Methylene chloride	3	< 0.75 UJ
Naphthalene	300	< 0.75 UJ
n-Butylbenzene	100	< 0.75 UJ
Ortho Xylene	1,000	< 0.75 UJ
p-Chlorotoluene	100	< 0.75 UJ
Propylbenzene	100	< 0.75 UJ
sec-Butylbenzene	100	< 0.75 UJ
Styrene	100	< 0.75 UJ
Tert Butyl Alcohol	100	< 12.5 UJ
tert-Butylbenzene	100	< 0.75 UJ
Tetrachloroethene	1	< 0.75 UJ
Toluene	600	< 0.75 UJ
Total Xylenes	1,000	< 2.3 UJ
Trans-1,2-Dichloroethene	100	< 0.75 UJ
Trans-1,3-Dichloropropene	1	< 0.75 UJ
Trichloroethene	1	< 0.75 UJ
Trichlorofluoromethane	2,000	< 0.75 UJ
Vinyl chloride	1	< 0.75 UJ

TABLE 1
GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GROUND WATER QUALITY CRITERIA
SITE PARCEL 79 142 UST
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-79-142B-MW-01
Sample ID		PAR-79-142B-GW-MW-01-9.7
Sample Date		1/17/2018
Sample Round		
Filtered		Total
Semivolatile Organic Compounds (µg/l)		
1,2,4-Trichlorobenzene	9	< 0.97 UJ
1,2-Dichlorobenzene	600	< 0.97 UJ
1,2-Diphenylhydrazine	20	< 0.97 UJ
1,3-Dichlorobenzene	600	< 0.97 UJ
1,4-Dichlorobenzene	75	< 0.97 UJ
2,4,5-Trichlorophenol	700	< 2.9
2,4,6-Trichlorophenol	20	< 0.97
2,4-Dichlorophenol	20	< 0.97
2,4-Dimethylphenol	100	< 4.8
2,4-Dinitrophenol	40	< 7.7
2,4-Dinitrotoluene	10	< 0.97 UJ
2,6-Dinitrotoluene	10	< 0.97 UJ
2-Chloronaphthalene	600	< 0.97 UJ
2-Chlorophenol	40	< 1.9
2-Methylnaphthalene	30	< 0.97 UJ
2-Methylphenol	100	< 0.97
2-Nitroaniline	100	< 0.97 UJ
2-Nitrophenol	100	< 1.9
3,3'-Dichlorobenzidine	30	< 2.9 UJ
3-Nitroaniline	100	< 1.9 UJ
4,6-Dinitro-2-methylphenol	1	< 4.8
4-Bromophenyl phenyl ether	100	< 0.97 UJ
4-Chloro-3-methylphenol	100	< 0.97
4-Chloroaniline	30	< 0.97 UJ
4-Chlorophenyl phenyl ether	100	< 0.97 UJ
4-Nitroaniline	5	< 0.97 UJ
4-Nitrophenol	100	< 4.8
Acenaphthene	400	< 0.97 UJ
Acenaphthylene	100	< 0.97 UJ
Anthracene	2,000	< 0.97 UJ
Benzidine	20	< 29 UJ
Benzo(a)anthracene	0.1	< 0.97 UJ
Benzo(a)pyrene	0.1	< 0.97 UJ
Benzo(b)fluoranthene	0.2	< 0.97 UJ
Benzo(ghi)perylene	100	< 0.97 UJ
Benzo(k)fluoranthene	0.5	< 0.97 UJ
Benzyl alcohol	2,000	< 1.9 UJ
Bis(2-Chloroethoxy)methane	100	< 0.97 UJ
Bis(2-Chloroethyl)ether	7	< 0.97 UJ
Bis(2-Chloroisopropyl)ether	300	< 0.97 UJ
Bis(2-Ethylhexyl)phthalate	3	< 0.97 UJ
Butyl benzyl phthalate	100	< 0.97 UJ
Carbazole	100	< 0.97 UJ
Chrysene	5	< 0.97 UJ
Cresol	NLE	< 0.97
Dibenz(a,h)anthracene	0.3	< 0.97 UJ
Dibenzofuran	100	< 0.97 UJ
Diethyl phthalate	6,000	< 0.97 UJ
Dimethyl phthalate	100	< 0.97 UJ
Di-n-butylphthalate	700	< 0.97 UJ
Di-n-octylphthalate	100	< 0.97 UJ
Fluoranthene	300	< 0.97 UJ
Fluorene	300	< 0.97 UJ
Hexachlorobenzene	0.02	< 0.97 UJ
Hexachlorobutadiene	1	< 0.97 UJ
Hexachlorocyclopentadiene	40	< 1.9 UJ
Hexachloroethane	7	< 0.97 UJ
Indeno(1,2,3-cd)pyrene	0.2	< 0.97 UJ
Isophorone	40	< 0.97 UJ
Naphthalene	300	< 0.97 UJ
Nitrobenzene	6	< 1.9 UJ
N-Nitrosodimethylamine	0.8	< 1.9 UJ
N-Nitroso-di-n-propylamine	10	< 0.97 UJ
N-Nitrosodiphenylamine	10	< 1.9 UJ
Pentachlorophenol	0.3	< 7.7
Phenanthrene	100	< 0.97 UJ
Phenol	2,000	< 0.97
Pyrene	200	< 0.97 UJ

Footnote:

1) All historical data collected prior to 2013 are reported as provided by others.

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

3) NLE = no limit established.

4) ND = not detected in any background sample, no background concentration available.

5) Bold chemical dectection

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

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

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

B =Compound detected in the sample at a concentration less than or equal to 5 times (10 times for common lab contaminants) the blank concentration.

R = Rejected, data validation rejected the results.

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

U-DL = Elevated sample detection limit due to difficult sample matrix.

U-ND = Analyte not detected in sample, but no detection or reporting limit provided.

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

E (or ER) = Estimated result.

D = Results from dilution of sample.

J-DL = Elevated sample detection limit due to difficult sample matrix.

JN = Tentatively identified compound, estimated concentration.

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

J+ = The result is an estimated quantity, but the result may be biased high.

J- = The result is an estimated quantity, but the result may be biased low.

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

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

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

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

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

10) Criteria action level source document and web address.

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

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

Attachment A
Correspondence

1. New Jersey Department of Environmental Protection (NJDEP). 2017. Letter to the Army, *Supplemental Unregulated Heating Oil Tank (UHOT) Work Plan, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. October 13.
2. Department of the Army. 2017. *Supplemental Unregulated Heating Oil Tank (UHOT) Work Plan, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. August 15.
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9. Department of the Army. 2015. *Underground Storage Tanks Within ECP Parcel 79. Fort Monmouth, Oceanport, Monmouth County*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. April 22.

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

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

BOB MARTIN
Commissioner

October 13, 2017

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

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

Dear Mr. Colvin,

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

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

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

Sincerely,

A.J. Joshi

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

DEPARTMENT OF THE ARMY

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

15 August 2017

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

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

Figures:

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

Tables:

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

Attachments:

A. Groundwater Flow Direction Maps

Dear Mr. Joshi:

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

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

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

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

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

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

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

1. UST 142B

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

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

2. UST 202A

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

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

3. UST 202D

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

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

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

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

4. UST 211

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

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

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

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

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

5. UST 228B

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

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

6. UST 444

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

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

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

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

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

7. UST 490

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

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

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

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

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

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

8. UST 750J

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

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

9. UST 800-12

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

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

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

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

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

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

10. UST 800-20

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

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

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

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

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

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

11. UST 884

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

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

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

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

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

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

12. UST 906A

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

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

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

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

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

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

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

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

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

13. UST 3035

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

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

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

14. SUMMARY

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

Sincerely,

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

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

REFERENCES CITED:

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3. Department of the Army. 2015. *No Further Action Request, Site Investigation Report Addendum for the 800 Area Including, ECP Parcels 55 and 56, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. June 12.
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11. New Jersey Department of Environmental Protection (NJDEP). 2007. Letter to the Army, RE: *Underground Storage Tank Closure & Remedial Investigation Reports, 800 Area UST No. 9, 800 Area UST No. 12, Fort Monmouth, NJ.* December 31.

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18. New Jersey Department of Environmental Protection (NJDEP). 2016. Letter to the Army, RE: *Clarification of Underground Storage Tanks at Howard Commons dated December 6, 2016, Fort Monmouth, Oceanport, Monmouth County.* December 20.

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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

May 8, 2017

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

Re: *Request for No Further Action at Multiple Parcel 79 Storage Tanks Site Investigation Report Addendum*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin,

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced report, received February 10, 2017, prepared by the Department of the Army's Office of Assistant Chief of Staff for Installation Management to present the results of additional sampling efforts at numerous above and underground storage tanks located within Parcel 79. Comments are as follows:

ASTs 1 & 2
Based upon soil and ground water analytical results, it is agreed no further action is necessary.

UST 142B
The request for an NFA for the PAHs found in ground water is not acceptable. The concentrations of benzo(a)anthracene is 85 times the Ground Water Quality Standard (GWQS). The concentration of benzo(a)pyrene is 149 times the GWQS, and benzo(b)fluoranthene is 97 times the GWQS. This location must be resampled using a method to reduce turbidity. Given the high concentrations when compared to samples taken from other UST locations, the Department is concerned these ground water concentrations may be indicative of actual ground water conditions, rather than the result of very turbid samples. A permanent well using low flow sampling methodology may be required to address this issue.

UST 444
Soil boring logs indicated odors and elevated PID readings. In addition, benzene, 2-methylnaphthalen and SVOC TICs exceeded the GWQS. As indicated in the submittal, further investigation at this location is necessary.

USTs 202A & 202D
As previously indicated in an email of April 17, 2017, the installation of a permanent well at a location immediately downgradient of UST 202D is recommended. Required analyses include VOs and SOVCs; the collection of SVOCs should be via low-flow.

UST 490
Ground water samples obtained from this location exceed the GWQS for 2-methylnaphthalene, PAHs, and SVOC TICs. The additional ground water investigations proposed must also include analyses for PAHs.

USTs Requiring No Additional Action
Following review of the referenced information, it is agreed no further action is necessary for the following #2 fuel USTs removed from within Parcel 79, as referenced in the above submittal:

- UST 437
- UST 440
- UST 441
- UST 445
- UST 448
- UST 449
- UST 450
- UST 451

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

Linda S. Range

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

DEPARTMENT OF THE ARMY

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

08 February 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 at Multiple Parcel 79 Storage Tanks Site Investigation Report Addendum
Fort Monmouth, Oceanport, New Jersey
PIG000000032

Attachments:

A. Figure 1: Layout of Parcel 79
Figure 2: Parcel 79 Area 75 Sample Locations
Figure 3: Groundwater Sample Locations for Multiple USTs at Parcel 79
Figure 4: Parcel 79 UST 142B Sample Locations
Figure 5: Parcel 79 UST 202A and 202D Sample Locations
Figure 6: Parcel 79 UST 490 Sample Locations

B. Table 1: Validated Laboratory Data Results for Groundwater, Parcel 79
Table 2: Validated Laboratory Data Results for Soil, Parcel 79

C. Field Notes

D. Boring Logs

E. Analytical Data

Previous Correspondence (not attached):

1. Army letter to NJDEP dated 22 April 2015, Subject: *Underground Storage Tanks within Parcel 79 Fort Monmouth, New Jersey.*
2. NJDEP letter to the Army dated 25 August 2015, Subject: *Underground Storage Tanks within ECP Parcel 76 dated April 2015 Fort Monmouth.*
3. Army letter to NJDEP dated 10 February 2016, Subject: *Response to NJDEP's August 25, 2015 Comments on the April 2015 Underground Storage Tanks within ECP Parcel 79, Fort Monmouth, New Jersey.*
4. NJDEP letter to Army dated 30 March 2016, Subject: *Response to NJDEP's August 25, 2015 Comments on the April 2015 Underground Storage Tanks within ECP Parcel 79 and Work Plan Addendum for Former Storage Tank Sites, Fort Monmouth, Oceanport, Monmouth County.*

Dear Ms. Range:

The U.S. Army Fort Monmouth (FTMM) Team has prepared this addendum to present the results of additional field sampling at the two Area 75 former Aboveground Storage Tanks (ASTs; designated as AST-1 and AST-2) and thirteen former Underground Storage Tanks (USTs) 142B, 202A, 202D, 437, 440, 441, 444, 445, 448, 449, 450, 451, and 490, all located within Environmental Condition of Property (ECP) Parcel 79 (Figure 1 of **Attachment A**). These USTs were unregulated heating oil tanks (UHOTs) that were identified as requiring additional sampling of groundwater. The Area 75 ASTs and USTs 202A, 202D, and 490 were also identified as requiring additional soil sampling, as described in the 10 February 2016 Parcel 79 Work Plan Addendum (Correspondence 3) and in the following subsection 1.0, 2.0, and 3.0.

One temporary groundwater monitor well was installed with a Geoprobe® rig immediately downgradient of Parcel 79 USTs 142B, 202A, 202D, 437, 440, 441, 444, 445, 448, 449, 450, and 451, and a groundwater sample was collected from each well to determine if a fuel oil release had impacted groundwater. For the Area 75 ASTs, a temporary well was installed immediately downgradient of each former tank. Three temporary wells were installed at UST 490 to delineate the extent of groundwater contamination. Groundwater samples were also collected from three permanent monitor wells (202MW01 at UST 202A, M16MW01 at202D, and 490MW01 at UST 490). Field sampling for temporary wells was completed on 3, 4, and 5 August 2016. Field sampling for permanent wells was completed on 25 May 2016. All groundwater samples were analyzed for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) plus tentatively identified compounds (TICs), in accordance with the requirements for No. 2 Fuel Oil in Table 2-1 of the New Jersey Administrative Code (NJAC) 7:26E Technical Requirements for Site Remediation.

Soil samples were also collected from borings advanced with a Geoprobe® rig at the Area 75 ASTs and USTs 202A, 202D, and 490 to assess current concentrations and vertical extent of extractable petroleum hydrocarbons (EPH) in soil. Field sampling was completed on 12 and 13 April 2016. One soil sample from boring PAR-79-490-SB-04 (at UST 490) was also analyzed for the additional contingency SVOC analytes naphthalene and 2-methylnaphthalene due to EPH concentration exceeding 1,000 mg/kg (NJDEP, 2010[1]).

It is important to note that the occurrence of polycyclic aromatic hydrocarbons (PAHs) in Parcel 79 groundwater warrants additional explanation. Exceedances of the NJDEP Ground Water Quality Criteria (GWQC) for multiple PAHs occurred at 12 of the 17 temporary wells during the August 2016 sampling. In contrast, none of the seven groundwater samples collected at permanent monitor wells 290MW01, M16MW01, and 490MW01 had any PAH exceedances. Furthermore, another nearby permanent well within Parcel 79 (430MW01; see Figure 3 of **Attachment A**) had no PAHs detected in samples collected in 1995, as reported in Attachment O of Correspondence 1. These relatively low solubility, high molecular weight PAHs such as benzo(a)pyrene have been

[1] NJDEP, 2010. *Protocol for Addressing Extractable Petroleum Hydrocarbons*. Site Remediation Program. Version 5.0. August 9.

encountered at other FTMM locations within surficial soils and fill that are unrelated to fuel oil USTs. Evidence of soil fill including brick and coal fragments were encountered within several Parcel 79 soil borings; please see **Attachment D.** Therefore, the PAH groundwater exceedances at Parcel 79 temporary wells were most likely the result of entrainment of soil resulting in sample turbidity, which is common with temporary well grab groundwater samples. In contrast, fuel oil releases are typically characterized by the specific PAHs naphthalene and 2-methylnaphthalene in groundwater. Therefore, temporary monitor wells with PAH exceedances that were not characteristic of fuel oil (i.e., without signature exceedances of naphthalene and 2-methylnaphthalene) are not considered indicative of a fuel oil release to groundwater.

The locations of the field samples are presented in Figures 1 through 6 of **Attachment A.** The analytical results and exceedances of applicable NJDEP criteria are provided in **Attachment B**. Field notes are provided in **Attachment C**, and boring logs are provided in **Attachment D**. The samples were analyzed by ALS Environmental; analytical data packages are provided in **Attachment E**.

1.0 AREA 75 ABOVE-GROUND STORAGE TANKS

AST-1 and AST-2 were bulk above-ground fuel oil tanks that were removed in 1995 as described in Attachment E of Correspondence 1. Four soil borings were sampled in response to NJDEP comments on the 10 February 2016 Work Plan Addendum (Correspondence 4). Soil samples were analyzed for EPH; additional contingency SVOC analysis for naphthalene and 2-methylnaphthalene was not required due to EPH concentrations not exceeding 1,000 mg/kg (NJDEP, 2010).

Soil analytical results are presented in Table 2 (**Attachment B**). The maximum total EPH concentration encountered in soil was 319 mg/kg, which is below the NJ Residential Direct Contact Soil Remediation Standard (RDCSRS) of 5,100 mg/kg. The results from the soil borings at AST-1 and AST-2 indicate that further soil investigation is not warranted.

Temporary well PAR-79-A75-TMW-01 was installed, sampled, and subsequently abandoned at the location of AST-2, and temporary well PAR-79-A75-TMW-02 was installed, sampled, and subsequently abandoned at the location of AST-1 (see Figure 2 of **Attachment A**). Groundwater was encountered at approximately 3 to 4 feet below ground surface (ft bgs) in the soil borings, and at 4 ft bgs and 9 ft bgs at the two wells; please see **Attachments C and D**. As shown on Table 2 of **Attachment B**, there were seven PAH exceedances of the GWQC (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene) in the primary sample and four exceedances (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and indeno[1,2,3-cd]pyrene) in the duplicate sample at PAR-79-A75-TMW01. There were three exceedances (benzo[a]anthracene, benzo[a]pyrene, and benzo[b]fluoranthene) of the GWQC in the groundwater sample at PAR-79-A75-TMW02. As indicated above, the PAH exceedances are attributable to entrainment of soil resulting in sample turbidity associated with the installation of the temporary wells. None of the groundwater samples collected in May 2016 from permanent monitor wells associated with Parcel 79 had any PAH exceedances. Another nearby permanent well within Parcel 79 (430MW01) had no PAHs detected

in samples collected in 1995. There were no exceedances of the GWQC indicative of fuel oil (i.e., naphthalene or 2-methylnaphthalene).

2.0 MULTIPLE PARCEL 79 UNDERGROUND STORAGE TANKS

The results of the sampling and analyses are provided below for each of the ten UHOT sites shown on Figures 3 and 4 in **Attachment A**.

UST 142B

UST 142B was a residential fuel oil tank that was removed in 1994 as described in Attachment H of Correspondence 1. Temporary well PAR-79-142-TMW-01 was installed, sampled, and subsequently abandoned (Figure 4 of **Attachment A**). Groundwater was encountered at approximately 7 ft bgs; please see **Attachment C.** As shown on Table 2 of **Attachment B**, there were seven GWQC exceedances (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene). As previously discussed, the PAH exceedances in this temporary well sample are attributable to entrainment of soil resulting in sample turbidity. There were no exceedances of the GWQC indicative of fuel oil (i.e., naphthalene or 2-methylnaphthalene)

UST 437

UST 437 was a residential fuel oil tank that was removed in 2010 as described in Attachment Q of Correspondence 1. Temporary well PAR-79-MP-TMW-08 was installed, sampled, and subsequently abandoned (Figure 3 of **Attachment A**). Groundwater was encountered at approximately 6 ft bgs; please see **Attachment C.** As shown on Table 2 of **Attachment B**, there were no exceedances of the GWQC.

UST 440

UST 440 was a residential fuel oil tank that was removed in 2010 as described in Attachment R of Correspondence 1. Temporary well PAR-79-MP-TMW-01 was installed, sampled, and subsequently abandoned (Figure 3 of **Attachment A**). Groundwater was encountered at approximately 5 ft bgs; please see **Attachment C**. As shown on Table 2 of **Attachment B**, benzo(a)anthracene (0.23 µg/l) and benzo(a)pyrene (0.13 µg/l) slightly exceeded the GWQC (0.1 µg/l) neither of which are indicative of fuel oil. As previously discussed, the PAH exceedances are attributable to entrainment of soil resulting in sample turbidity associated with the installation of the temporary well. There were no exceedances of the GWQC indicative of fuel oil (i.e., naphthalene or 2-methylnaphthalene).

UST 441

UST 441 was a residential fuel oil tank that was removed in 2010 as described in Attachment D of Correspondence 1. Temporary well PAR-79-MP-TMW-07 was installed, sampled, and subsequently abandoned (Figure 3 of **Attachment A**). Groundwater was encountered at approximately 8 ft bgs; please see **Attachment C**. As shown on Table 2 of **Attachment B**,

benzo(a)anthracene (0.34 µg/l), benzo(a)pyrene (0.29 µg/l), and benzo(b)fluoranthene (0.31 µg/l) slightly exceeded the GWQC (0.1, 0.1, and 0.2 µg/l, respectively). As previously discussed, the PAH exceedances are attributable to entrainment of soil resulting in sample turbidity associated with the installation of the temporary well. There were no exceedances of the GWQC indicative of fuel oil (i.e., naphthalene or 2-methylnaphthalene).

UST 444

UST 444 was a residential fuel oil tank that was removed in 2010 as described in Attachment V of Correspondence 1. Temporary well PAR-79-MP-TMW-02 was installed, sampled, and subsequently abandoned (Figure 3 of **Attachment A**). Groundwater was encountered at approximately 4 ft bgs; please see **Attachment C**. As shown on Table 2 of **Attachment B**, one VOC (benzene) and three SVOCs (2-methylnapthalene, benzo[a]anthracene, and benzo[a]pyrene) exceeded the GWQC. The total sum of SVOC TICs also exceeded the GWQC. There were no exceedances of the GWQC indicative of fuel oil (i.e., naphthalene or 2-methylnaphthalene).

UST 445

UST 445 was a residential fuel oil tank that was removed in 2010 as described in Attachment U of Correspondence 1. Temporary well PAR-79-MP-TMW-06 was installed, sampled, and subsequently abandoned (Figure 3 of **Attachment A**). Groundwater was encountered at approximately 5 ft bgs; please see **Attachment C**. As shown on Table 2 of **Attachment B**, there were no exceedances of the GWQC.

UST 448

UST 448 was a residential fuel oil tank that was removed in 2010 as described in Attachment W of Correspondence 1. Temporary well PAR-79-MP-TMW-03 was installed, sampled, and subsequently abandoned (Figure 3 of **Attachment A**). Groundwater was encountered at approximately 4 ft bgs; please see **Attachment C**. As shown on Table 2 of **Attachment B**, there were no exceedances of the GWQC.

UST 449

UST 449 was assumed to be a residential fuel oil tank because of information identified during a records review. Soil samples were collected in 2010, and a soil sample for a test trench was excavated in May 2010. The results of the test trench and visual evidence indicated that a release had occurred, but no tank was found. The soils had a strong petroleum odor as described in Attachment X of Correspondence 1. Temporary well PAR-79-MP-TMW-04 was installed, sampled, and subsequently abandoned (Figure 3 of **Attachment A**). Groundwater was encountered at approximately 5 ft bgs; please see **Attachment C**. As shown on Table 2 of **Attachment B**, benzo(a)anthracene (0.25 µg/l), benzo(a)pyrene (0.13 µg/l), and benzo(b)fluoranthene (0.22 µg/l) slightly exceeded the GWQC (0.1, 0.1, and 0.2, respectively). As previously discussed, the PAH exceedances are attributable to entrainment of soil resulting in

sample turbidity associated with the installation of the temporary well. There were no exceedances of the GWQC indicative of fuel oil (i.e., naphthalene or 2-methylnaphthalene).

UST 450

UST 450 was a residential fuel oil tank that was removed in 2010 as described in Attachment Y of Correspondence 1. Temporary well PAR-79-MP-TMW-05 was installed, sampled, and subsequently abandoned (Figure 3 of **Attachment A**). Groundwater was encountered at approximately 5 ft bgs; please see **Attachment C**. As shown on Table 2 of **Attachment B**, there were no exceedances of the GWQC.

UST 451

UST 451 was a residential fuel oil tank that was removed in 2010 as described in Attachment Z of Correspondence 1. Temporary well PAR-79-MP-TMW-09 was installed, sampled, and subsequently abandoned (Figure 3 of **Attachment A**). Groundwater was encountered at approximately 4 ft bgs; please see **Attachment C**. As shown on Table 2 of **Attachment B**, benzo(a)anthracene (0.18 µg/l) slightly exceeded the GWQC (0.1 µg/l) in this groundwater sample. As previously discussed, the PAH exceedances are attributable to entrainment of soil resulting in sample turbidity associated with the installation of the temporary wells. There were no exceedances of the GWQC indicative of fuel oil (i.e., naphthalene or 2-methylnaphthalene).

3.0 USTS 202A AND 202D

USTs 202A and 202D were residential fuel oil tanks that were removed in 2001 as described in Attachment J of Correspondence 1. Three soil borings (see Figure 5 of **Attachment A**) were sampled in response to NJDEP comments on the 10 February 2016 Work Plan Addendum (Correspondence 4). Soil samples were analyzed for EPH; additional contingency SVOC analyses for naphthalene and 2-methylnaphthalene was not required (NJDEP, 2010). Soil analytical results are presented in Table 2 (Attachment B). The maximum total EPH concentration encountered in soil was 345 mg/kg. The results from the soil borings at USTs 202A and 202D indicate that further soil investigation is not warranted.

Temporary well PAR-79-202-TMW-01 was installed, sampled, and subsequently abandoned (Figure 5 of **Attachment A**). Groundwater was encountered at approximately 2 to 5 ft bgs; please see **Attachments C and D**. Permanent monitor wells 202MW01 and M16MW02 were previously installed at this site, and were also sampled (Figure 5 of **Attachment A**). Well 202MW01 was installed near the former location of UST 202D in August 2011 but apparently was never previously sampled. Well M16MW02 was constructed in March 2011 and is located downgradient of USTs 202A and 202D.

As shown on Table 2 of **Attachment B**, there was one slight PAH exceedance (benzo[a]anthracene at 0.19 µg/l) of the GWQC (0.1 µg/l) in the temporary well sample. There were no exceedances of the GWQC in the permanent well samples. As previously discussed, the PAH exceedances are attributable to entrainment of soil resulting in sample turbidity associated with the installation of

the temporary well. There were no exceedances of the GWQC indicative of fuel oil (i.e., naphthalene or 2-methylnaphthalene).

4.0 UST 490

UST 490 was a residential fuel oil tank that was removed in 1990 as described in Attachment CC of Correspondence 1. Four soil borings were sampled in response to NJDEP comments on the 10 February 2016 Work Plan Addendum (Correspondence 4), and soil samples were analyzed for EPH.

Total EPH concentrations of 1,600 mg/kg in one of the soil samples (the 3.5 to 4 ft bgs interval of boring PAR-79-490-SB-04; see Table 2 of **Attachment B**) exceeded the contingency analysis threshold of 1,000 mg/kg (NJDEP, 2010), and therefore this sample was also analyzed for naphthalene and 2-methylnaphthalene. The 2-methylnaphthalene concentration of 9,000 J µg/kg in this sample exceeded the NJDEP IGW screening level of 8,000 µg/kg, but did not exceed the RDCSRS. Additional Synthetic Precipitation Leachate Procedure (SPLP) analysis of this soil sample was not performed, as prescribed in NJDEP (2010).

Three temporary wells (PAR-79-490-TMW-01, PAR-79-490-TMW-02, and PAR-79-490-TMW-03) were installed, sampled for groundwater, and subsequently abandoned (Figure 6 of **Attachment A**). Existing monitor well 490MW01, installed in August 2011, was also sampled. (**Attachment A**). Groundwater was encountered at approximately 2 to 3.5 ft bgs; please see **Attachments C and D**.

As shown on Table 2 of **Attachment B**, PAH exceedances of the GWQC were encountered at temporary wells PAR-79-490-TMW01 (benzo[a]anthracene) and PAR-79-490-TMW02 (benzo[a]anthracene and benzo[b]fluoranthene). As previously discussed, the PAH exceedances are attributable to entrainment of soil resulting in sample turbidity associated with the installation of the temporary wells. There were no exceedances of the GWQC indicative of fuel oil (i.e., naphthalene or 2-methylnaphthalene). There were no exceedances of the GWQC in the three groundwater samples collected from permanent well 490MW01. However, there were GWQC exceedances for 2-methynaphthalene and the sum of SVOC TICs in the groundwater sample from PAR-79-490-TMW03, which was located downgradient of the former UST 490.

5.0 SUMMARY

No Further Action determinations are requested for soil and groundwater for the two ASTs at Area 75 and USTs 202A and 202D. No Further Action determinations are requested for groundwater for USTs 142 B, 437, 440, 441, 445, 448, 449, 450, and 451.Additional work would be needed for NFA determinations to be made at USTs 490 and 444. The technical Point of Contact (POC) for this matter is Kent Friesen at (732) 383-7201 or kent.friesen@parsons.com. Should you have any questions or require additional information, please contact me by phone at (732) 380-7064 or william.r.colvin18.civ@mail.mil.

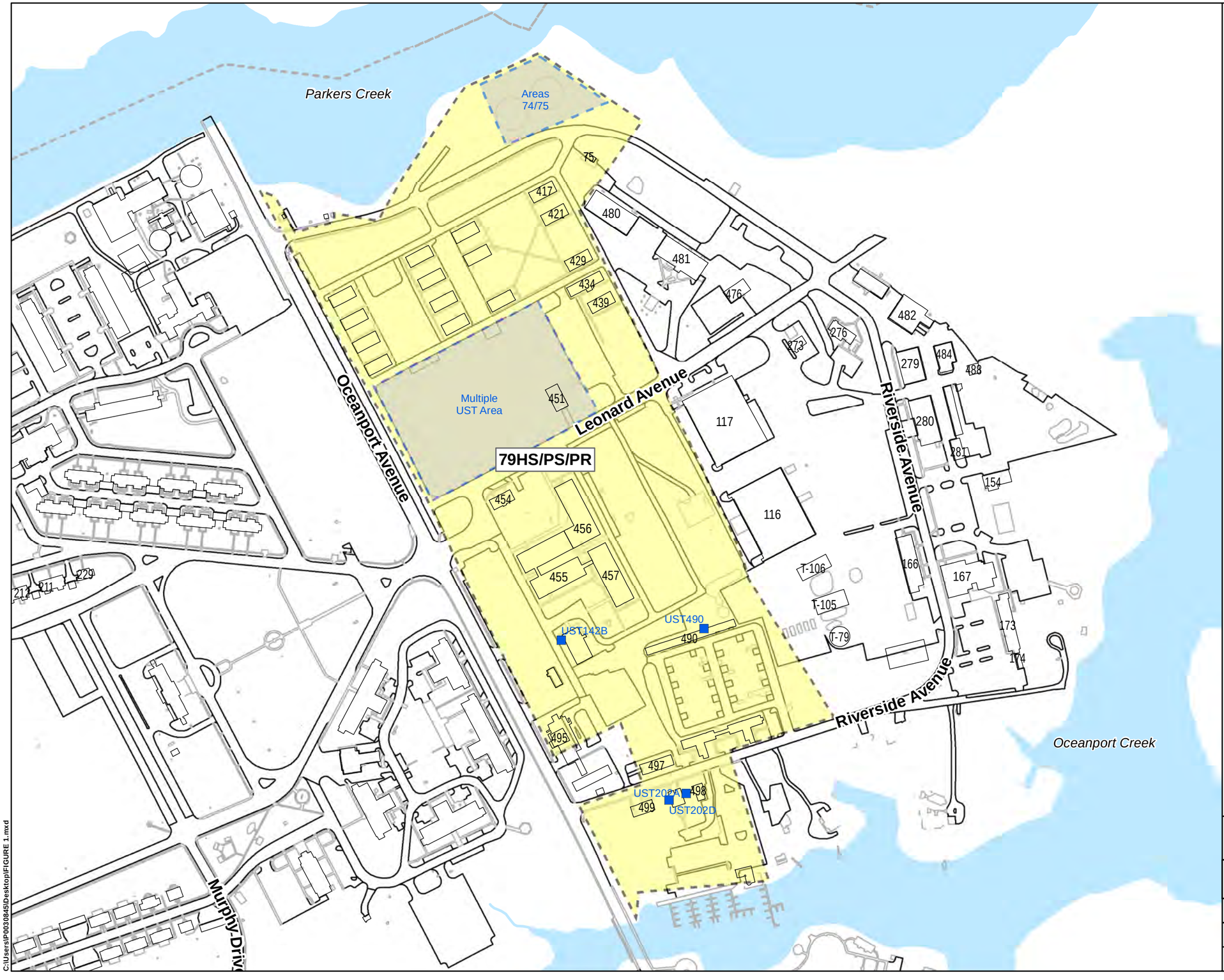
Sincerely,

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

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

Attachment A
Figures

For brevity, Atttachments have been edited to include only information relevant to UST 142B



LEGEND:

- Parcel 79 Boundary
- Municipal Boundary
- Multiple UST Area
- Surface Water Feature
- UST Location

N

1 inch = 300 feet

0 150 300 600 Feet

Source: FTMM Supplied CAD, 2013; U.S. Army BRAC, 2008; 2008 SI Report; USGS NHD, 2012.

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
LAYOUT OF PARCEL 79	
CREATED BY: RR	REVIEWED BY: KF
DATE: JAN. 2017	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-06010	FILE: FIGURE 1.mxd

C:\Users\P0030845\Desktop\FIGURE 1.mxd

455

457

Tilly Avenue

UST142A

PAR-79-142-TMW-01

UST142B

79HS/PS/PR

490

Oceanport Avenue

LEGEND:

- Parcel 79 Boundary
- Municipal Boundary
- Former UST Location
- Groundwater Sample (2016)
- Estimated Groundwater Flow Direction

N

1 inch = 40 feet

0 20 40 80 Feet

Source: FTMM Supplied CAD, 2013; U.S. Army BRAC, 2008; 2008 SI Report; USGS NHD, 2012.

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2016 RI\FIGURE 5.mxd

PARSONS 401 Diamond Drive NW, Huntsville AL	**Fort Monmouth** **New Jersey**
PARCEL 79 UST142B SAMPLE LOCATION	
CREATED BY: **RR**	REVIEWED BY: **KF**
DATE: **MAY. 2016**	FIGURE NUMBER: **FIGURE 4**
PROJECT NUMBER: **748810-06010**	FILE: **FIGURE 4.mxd**

Attachment B
Validated Laboratory Data Results for Groundwater and Soil, Parcel 79

Attachment B - Table 1
Validated Laboratory Data Results for Groundwater
Parcel 79

Loc ID	NJ Ground Water Quality Criteria	P79-MP-TMW03	P79-MP-TMW04	P79-MP-TMW05	P79-MP-TMW06	P79-MP-TMW07	P79-MP-TMW08	P79-MP-TMW09	PAR-79-142-TMW01	PAR-79-202-TMW01
Sample ID		PAR-79-MP-TMW03	PAR-79-MP-TMW04	PAR-79-MP-TMW05	PAR-79-MP-TMW06	PAR-79-MP-TMW07	PAR-79-MP-TMW08	PAR-79-MP-TMW09	PAR-79-142-TMW01	PAR-79-202-TMW01
Sample Date		8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/5/2016	8/5/2016
Filtered		Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)										
1,1,1,2-Tetrachloroethane	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,1,1-Trichloroethane	30	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,1,2,2-Tetrachloroethane	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,1,2-Trichloroethane	3	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,1-Dichloroethane	50	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,1-Dichloroethene	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,1-Dichloropropene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,2,3-Trichlorobenzene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,2,3-Trichloropropane	0.03	< 2.5	< 2.5 UJ	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5 UJ	< 2.5
1,2,4-Trichlorobenzene	9	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,2,4-Trimethylbenzene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,2-Dibromo-3-chloropropane	0.02	< 2.5	< 2.5 UJ	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5 UJ	< 2.5
1,2-Dibromoethane	0.03	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,2-Dichlorobenzene	600	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,2-Dichloroethane	2	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,2-Dichloropropane	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,3,5-Trimethylbenzene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,3-Dichlorobenzene	600	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,3-Dichloropropane	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
1,4-Dichlorobenzene	75	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
2,2-Dichloropropane	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
2-Chlorotoluene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Acetone	6,000	**6 B**	**4.2 JB**	**5.3 B**	**4.2 JB**	< 3.8	**7.8 B**	**3.7 JB**	**7.2 BJ**	< 3.8
Benzene	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Bromobenzene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Bromochloromethane	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Bromodichloromethane	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Bromoform	4	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Carbon tetrachloride	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Chlorobenzene	50	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Chlorodibromomethane	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Chloroethane	5	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Chloroform	70	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Cis-1,2-Dichloroethene	70	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Cis-1,3-Dichloropropene	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Cymene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Dichlorodifluoromethane	1,000	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Ethyl benzene	700	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Hexachlorobutadiene	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Isopropylbenzene	700	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Meta/Para Xylene	1,000	< 1.5	< 1.5 UJ	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5 UJ	< 1.5
Methyl bromide	10	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Methyl butyl ketone	300	< 3.8	< 3.8 UJ	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8 UJ	< 3.8
Methyl chloride	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Methyl ethyl ketone	300	< 3.8	< 3.8 UJ	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8 UJ	< 3.8
Methyl isobutyl ketone	100	< 3.8	< 3.8 UJ	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8 UJ	< 3.8
Methyl Tertbutyl Ether	70	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	**0.48 J**
Methylene chloride	3	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75

Attachment B - Table 1
Validated Laboratory Data Results for Groundwater
Parcel 79

Loc ID	NJ Ground Water Quality Criteria	P79-MP-TMW03	P79-MP-TMW04	P79-MP-TMW05	P79-MP-TMW06	P79-MP-TMW07	P79-MP-TMW08	P79-MP-TMW09	PAR-79-142-TMW01	PAR-79-202-TMW01
Sample ID		PAR-79-MP-TMW03	PAR-79-MP-TMW04	PAR-79-MP-TMW05	PAR-79-MP-TMW06	PAR-79-MP-TMW07	PAR-79-MP-TMW08	PAR-79-MP-TMW09	PAR-79-142-TMW01	PAR-79-202-TMW01
Sample Date		8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/5/2016	8/5/2016
Filtered		Total	Total	Total	Total	Total	Total	Total	Total	Total
Naphthalene	300	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
n-Butylbenzene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Ortho Xylene	1,000	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
p-Chlorotoluene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Propylbenzene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
sec-Butylbenzene	100	< 0.75	**0.34 J**	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Styrene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Tert Butyl Alcohol	100	< 12.5	< 12.5 UJ	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5 UJ	< 12.5
tert-Butylbenzene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Tetrachloroethene	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Toluene	600	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Trans-1,2-Dichloroethene	100	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Trans-1,3-Dichloropropene	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Trichloroethene	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Trichlorofluoromethane	2,000	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
Vinyl chloride	1	< 0.75	< 0.75 UJ	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75 UJ	< 0.75
TIC VOCs (µg/l)										
Total TICs, Volatile	500	NA	`1	NA	NA	NA	NA	NA	**1.5 JN**	NA
Semivolatile Organic Compounds (µg/l)										
1,2,4-Trichlorobenzene	9	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
1,2-Dichlorobenzene	600	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
1,2-Diphenylhydrazine	20	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
1,3-Dichlorobenzene	600	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
1,4-Dichlorobenzene	75	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
2,4,5-Trichlorophenol	700	< 3	< 2.9	< 2.8	< 3	< 2.9	< 3.3	< 3.2	< 15 UJ	< 2.9
2,4,6-Trichlorophenol	20	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
2,4-Dichlorophenol	20	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
2,4-Dimethylphenol	100	< 5	< 4.8	< 4.6	< 5	< 4.9	< 5.6	< 5.3	< 25 UJ	< 4.8
2,4-Dinitrophenol	40	< 7.9	< 7.6	< 7.4	< 8	< 7.8	< 8.9	< 8.6	< 40 UJ	< 7.7
2,4-Dinitrotoluene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	10	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	600	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
2-Chlorophenol	40	< 2	< 1.9	< 1.9	< 2	< 2	< 2.2	< 2.1	< 10 UJ	< 1.9
2-Methylnaphthalene	30	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	**2.9 J**	< 0.96
2-Methylphenol	100	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
2-Nitroaniline	100	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
2-Nitrophenol	100	< 2	< 1.9	< 1.9	< 2	< 2	< 2.2	< 2.1	< 10 UJ	< 1.9
3,3'-Dichlorobenzidine	30	< 3	< 2.9	< 2.8	< 3	< 2.9	< 3.3	< 3.2	< 15 UJ	< 2.9
3-Nitroaniline	100	< 2	< 1.9	< 1.9	< 2	< 2	< 2.2	< 2.1	< 10 UJ	< 1.9
4,6-Dinitro-2-methylphenol	1	< 5	< 4.8	< 4.6	< 5	< 4.9	< 5.6	< 5.3	< 25 UJ	< 4.8
4-Bromophenyl phenyl ether	100	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
4-Chloro-3-methylphenol	100	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
4-Chloroaniline	30	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
4-Chlorophenyl phenyl ether	100	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
4-Nitroaniline	5	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
4-Nitrophenol	100	< 5	< 4.8	< 4.6	< 5	< 4.9	< 5.6	< 5.3	< 25 UJ	< 4.8
Acenaphthene	400	< 0.04	**0.012 J**	< 0.037	**0.026 J**	**0.018 J**	< 0.044	< 0.043	**0.27 J**	< 0.038
Acenaphthylene	100	< 0.04	**0.04 J**	< 0.037	< 0.04	**0.2 J**	< 0.044	**0.025 J**	**8.1 J**	**0.2 J**
Anthracene	2,000	< 0.04	**0.096**	< 0.037	< 0.04	**0.081**	< 0.044	< 0.043	**4.5 J**	**0.016 J**

Attachment B - Table 1
Validated Laboratory Data Results for Groundwater
Parcel 79

Loc ID	NJ Ground Water Quality Criteria	P79-MP-TMW03	P79-MP-TMW04	P79-MP-TMW05	P79-MP-TMW06	P79-MP-TMW07	P79-MP-TMW08	P79-MP-TMW09	PAR-79-142-TMW01	PAR-79-202-TMW01
Sample ID		PAR-79-MP-TMW03	PAR-79-MP-TMW04	PAR-79-MP-TMW05	PAR-79-MP-TMW06	PAR-79-MP-TMW07	PAR-79-MP-TMW08	PAR-79-MP-TMW09	PAR-79-142-TMW01	PAR-79-202-TMW01
Sample Date		8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/5/2016	8/5/2016
Filtered		Total	Total	Total	Total	Total	Total	Total	Total	Total
Benzidine	20	< 29.7 UJ	< 28.6 UJ	< 27.8 UJ	< 29.9 UJ	< 29.4 UJ	< 33.3 UJ	< 32.1 UJ	< 150 UJ	< 28.8
Benzo(a)anthracene	0.1	**0.043 J**	**0.25 J**	< 0.037	**0.021 J**	**0.34 J**	< 0.044	**0.18 J**	**8.5 J**	**0.19 J**
Benzo(a)pyrene	0.1	**0.043 JB**	**0.13 B**	< 0.037	< 0.04	**0.29 J**	< 0.044	**0.081 B**	**14.9 J**	**0.057**
Benzo(b)fluoranthene	0.2	**0.066 B**	**0.22 J**	< 0.037	< 0.04	**0.31 J**	**0.027 JB**	**0.12 B**	**19.4 J**	**0.13 J**
Benzo(ghi)perylene	100	< 0.04	**0.087 B**	< 0.037	< 0.04	**0.17 B**	< 0.044	**0.046 JB**	**12.6 J**	**0.044 J**
Benzo(k)fluoranthene	0.5	**0.028 JB**	**0.073 B**	< 0.037	< 0.04	**0.1 B**	< 0.044	**0.042 JB**	**7.5 J**	< 0.038
Benzyl alcohol	2,000	< 2	< 1.9	< 1.9	< 2	< 2	< 2.2	< 2.1	< 10 UJ	< 1.9
Bis(2-Chloroethoxy)methane	100	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
Bis(2-Chloroethyl)ether	7	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
Bis(2-Chloroisopropyl)ether	300	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
Bis(2-Ethylhexyl)phthalate	3	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	**0.33 J**
Butyl benzyl phthalate	100	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	**0.12 J**	**0.65 J**	< 0.96
Carbazole	100	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	**1.5 J**	< 0.96
Chrysene	5	**0.054**	**0.15**	< 0.037	**0.022 J**	**0.3 J**	**0.029 J**	**0.1**	**13.5 J**	**0.066**
Cresol	NLE	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
Dibenz(a,h)anthracene	0.3	< 0.04	**0.023 JB**	< 0.037	< 0.04	**0.048 JB**	< 0.044	< 0.043	**2.9 J**	< 0.038
Dibenzofuran	100	< 0.99	**0.29 J**	< 0.93	< 1	< 0.98	< 1.1	< 1.1	**0.75 J**	< 0.96
Diethyl phthalate	6,000	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	**0.28 J**
Dimethyl phthalate	100	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
Di-n-butylphthalate	700	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	**0.71 J**	**0.28 J**
Di-n-octylphthalate	100	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
Fluoranthene	300	**0.464**	**0.74**	**0.637**	**0.35**	**0.78**	**0.488 J**	**0.57**	**17.7 J**	**0.652**
Fluorene	300	< 0.04	**0.13 B**	**0.016 JB**	**0.017 JB**	**0.05 B**	< 0.044	**0.018 JB**	**0.77 J**	**0.024 J**
Hexachlorobenzene	0.02	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
Hexachlorobutadiene	1	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
Hexachlorocyclopentadiene	40	< 2	< 1.9	< 1.9	< 2	< 2	< 2.2	< 2.1	< 10 UJ	< 1.9
Hexachloroethane	7	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
Indeno(1,2,3-cd)pyrene	0.2	< 0.05	**0.099 J**	< 0.046	< 0.05	**0.2 J**	< 0.056	**0.047 JB**	**11.9 J**	**0.042 J**
Isophorone	40	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
Naphthalene	300	**0.05**	**0.1**	< 0.037	< 0.04	**0.062**	< 0.044	< 0.043	**3.3 J**	< 0.038
Nitrobenzene	6	< 2	< 1.9	< 1.9	< 2	< 2	< 2.2	< 2.1	< 10 UJ	< 1.9
N-Nitrosodimethylamine	0.8	< 2	< 1.9	< 1.9	< 2	< 2	< 2.2	< 2.1	< 10 UJ	< 1.9
N-Nitroso-di-n-propylamine	10	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
N-Nitrosodiphenylamine	10	< 2	< 1.9	< 1.9	< 2	< 2	< 2.2	< 2.1	< 10 UJ	< 1.9
Pentachlorophenol	0.3	< 0.99 UJ	< 0.95 UJ	< 0.93 UJ	< 1 UJ	< 0.98 UJ	< 1.1 UJ	< 1.1 UJ	< 5 UJ	< 0.96
Phenanthrene	100	**0.061 B**	**0.34 J**	**0.026 JB**	**0.13 J**	**0.2 J**	**0.038 JB**	**0.093 B**	**8.7 J**	**0.075**
Phenol	2,000	< 0.99	< 0.95	< 0.93	< 1	< 0.98	< 1.1	< 1.1	< 5 UJ	< 0.96
Pyrene	200	**0.076**	**0.37 J**	< 0.037	**0.037 J**	**0.45 J**	**0.05 J**	**0.14**	**18.4 J**	**0.083**
TIC SVOCs (µg/l)										
Total TICs, Semi-Volatile	500	NA	**79.6 JN**	**11.9 J**	**33.3 JN**	**45.7 JN**	**19.7 JN**	**96.8 JN**	**253.7 JN**	**144.6 JN**

Footnote:

1) All historical data collected prior to 2013 are reported as provided by others.

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

3) NLE = no limit established.

4) ND = not detected in any background sample, no background concentration available.

5) Bold chemical dectection

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

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

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

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

B =Compound detected in the sample at a concentration less than or equal to 5 times (10 times for common lab contaminants) the blank concentration.

E (or ER) = Estimated result.

R = Rejected, data validation rejected the results.

D = Results from dilution of sample.

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

J-DL = Elevated sample detection limit due to difficult sample matrix.

U-DL = Elevated sample detection limit due to difficult sample matrix.

JN = Tentatively identified compound, estimated concentration.

U-ND = Analyte not detected in sample, but no detection or reporting limit provided.

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

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

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

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

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

10) Criteria action level source document and web address.

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

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

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

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

BOB MARTIN
Commissioner

March 30, 2016

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

Re: *Response to NJDEP's August 25, 2015 Comments on the April 2015 Underground Storage Tanks Within ECP Parcel 79 & Work Plan Addendum for Former Storage Tank Sites*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced submittals.

Area 75 - ASTs

Previous analytical results indicated sampling from one of the ASTs found no exceedences. It is agreed, however, the absence of a sample map renders the ability to associate sample locations with a specific AST impossible, and that additional sampling of soil and ground water from each is appropriate. Sampling as proposed is approved.

USTs

Section 4.2 - Ground water sampling at each of the locations proposed is approved.

UST 445 / Attachment V – It is agreed Attachment V provided information of UST 445, rather than 455, as had been previously indicated; the proposed ground water sample is approved.

B4. The Army has determined no further evaluation (i.e., no sampling) is to be performed if there is no indication of an existing UST, or evidence of a discharge. Although this conclusion is acknowledged, the Department's previous comments remain in effect.

Building 202

Sampling as proposed is approved. To clarify, however, it is assumed elevated levels of ground water contamination remain at UST 202D, and proposed sample located downgradient is for delineation purposes.

It is agreed, based upon information contained in Attachments K and L of the April 2015 submittal, no additional action is necessary for USTs 202B and 202C.

UST 490

Previous correspondence referenced levels of TPH previously found up to 8762 ppm, at least to 6.5' and perhaps deeper, above the residual product/free product limit of 8,000 mg for No 2 fuel, as well as 2- methylnaphthalene above standard in the soil and ground water. Although the proposed soil and ground water sample locations are approved, a vertical soil delineation sample is also necessary in the area of the original exceedance (which may also assess current conditions).

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

Linda S. Range

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

DEPARTMENT OF THE ARMY

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

February 10, 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

Re: Response to NJDEP's August 25, 2015 Comments on the April 2015 *Underground Storage Tanks Within ECP Parcel 79, Fort Monmouth, New Jersey*
PI G000000032

Dear Ms. Range:

Fort Monmouth and Parsons have reviewed the New Jersey Department of Environmental Protection (NJDEP) comments on the subject submittal for ECP Parcel 79, as documented in your letter dated August 25, 2015. We appreciate this opportunity to work with you on Parcel 79. Responses to your comments are provided below, for your review and concurrence or further comments.

A. <u>Attachment E – Areas 74 and 75, Aboveground Storage Tanks and Associated Piping</u>

A1. COMMENT: *Area 75 – Aboveground Storage Tanks: Two 210,000 gallon aboveground storage tanks, utilized from the 1940s through the 1980s, were removed in May of 1995. Based upon a review of the analytical results and chain of custody (COC) as well as a conversation with Joe Fallon this date, who collected the samples, it appears 13 samples were collected in the proximity of AST A - all analytical results were below 1000 ppm, and 15 samples in the proximity of AST B. Per Mr. Fallon, the samples would have been collected both at/along the perimeter and within the footprint/center of the former ASTs, mainly at 0-6", but also at deeper intervals (as indicated on the COCs). Although it appears sampling frequency and location may have been adequate, it is unclear the analytical parameter requirements, either those in effect at the time of sampling or currently in effect, were met as regarding contingency analysis for AST B. Of the 15 samples apparently collected for AST B, 5 exceeded the trigger for additional analyses on 25% of those exceeding 1000 ppm (VOs+ 10 at the time of sampling, 2-methylnaphthalene and naphthalene per current guidance). It is also unclear where the ground water sampling points referenced for Area 74 were located relative to the former ASTs of Area 75?*

A1. RESPONSE: Additional soil and groundwater sampling is proposed at Area 75 as described in the attached ***Parcel 79 Work Plan Addendum***. Soil sample results from 1995 were reported in the April 2015 ***Underground Storage Tanks Within ECP Parcel 79*** submittal; however, there is some uncertainty regarding the sample locations because a sample map was not located. For example, the highest Total Petroleum Hydrocarbons (TPH) concentrations in soil were encountered in samples labeled as "AST-B," but it is unclear to which of the two ASTs these sample designations referred. Further, there was uncertainty regarding the locations of groundwater samples collected for adjoining

Area 74. Therefore, soil and groundwater from both former AST locations (AST-1 and AST-2 as described in the attached ***Parcel 79 Work Plan Addendum***) will be re-sampled to characterize the current concentration of TPH constituents in this area and, if necessary, the need for any contingency analyses in soil. Soil samples from 4 boring locations within the vicinity of the former ASTs, and groundwater samples from two of these four locations, will be collected as described in the attached ***Parcel 79 Work Plan Addendum***.

A2: COMMENT: *Area 74 -Associated Piping: As per Enclosure 4 of Attachment E, the underground piping was previously NFAed.*

A2: RESPONSE: Agreed.

B. <u>Underground Storage Tanks</u>

B1. COMMENT: *In addition to those USTs previously granted a designation of NFA, it is agreed no further action is necessary for the following #2 fuel USTs:*

***UST 29-1** – 1000 gallon steel*
***UST 142A** – 1000 gallon steel; C93-3714*
***UST 401-26** – 1000 gallon steel*
***UST 416-32** – 1000 gallon steel*
***UST 430B-45** – 550 gallon tank*; C93-3987*
**note – page 1, Section 1.1 and scrap receipt each indicate UST was steel; Att B states fiberglass*
***UST 443-49** – 1080 gallon steel*
***UST 474** – 1000 gallon steel*

B1. RESPONSE: Agreed. File photographs of UST 430B-45 confirm that it was a steel tank.

B2. COMMENT: *Although the 2008 Site Investigation previously performed did include ground water sampling, a review of the sampling points did not indicate they were placed within distances sufficient to allow for adequate evaluation of the USTs referenced below. Based upon soil contamination extending to within 2' of, and in many cases, into the ground water table (GWT), a ground water investigation is necessary at the following UST locations (the elimination of the sheen via excavation, as referenced for USTs 441, 444 is insufficient):*

***UST 142B** (Attachment H)*
***UST 437** (Attachment Q)*
***UST 440** (Attachment R)*
***UST 441** (Attachment S)*
***UST 444** (Attachment U)*
***UST 448** (Attachment W); please specify if well P79-E2 is sufficiently proximate to comply with regulations/guidance*
***UST 449** (Attachment X)*
***UST 450** (Attachment Y)*
***UST 451** (Attachment Z)*

B2. RESPONSE: Additional groundwater sampling is proposed to assess the potential for impacts to groundwater from each of the UST sites listed above, as described in the attached ***Parcel***

79 Work Plan Addendum. The 2008 SI sample P79-E2 was slightly displaced from the former UST 448 location and so additional sampling near this UST location will be performed. Also, UST 445 has been added to this list (see Response B3 below). A total of 10 groundwater samples will be collected from temporary well locations downgradient of these former USTs.

B3. COMMENT: *Though it is understood no evidence was found of a tank remaining in the below referenced locations during geophysical or trenching activities, a tank was noted as present in historic Army material, e.g. 1956 Fuel Storage Map, while Attachment 1 indicates heating oil USTs may remain between Tilly Avenue and Leonard Avenue. No soil sampling was apparently performed in any of these locations. Unless all tanks, former or current, have been evaluated in accordance with the applicable Departmental regulations and guidance documents, the NJDEP cannot comment as to the absence or presence of a petroleum discharge. The request on page 7 of 7 for designation of an NFA for the following USTs cannot be granted unless the necessary sampling is performed at each:*

UST/Bldg. No. 168 (Attachment I)
UST/Bldg. No. 169 (Attachment I)
UST/Bldg. No. 407
UST/Bldg. No. 415
UST/Bldg. No. 424
UST/Bldg. No. 425
UST/Bldg. No. 435 (Attachment P)
UST/Bldg. No. 438
UST/Bldg. No. 442
UST/Bldg. No. 455 (Attachment V)
UST/Bldg. No. 456 (Attachment AA consisted of only analytical data, from a single sample – 6-12"; information provided is insufficient for evaluation/comment)
USTs/Bldg. No.s 457 through 467
UST/Bldg. No.s 469 through 473
UST/Bldg. No. 476
UST/Bldg. No. 488
UST/Bldg. No. 489

B3. RESPONSE: As discussed in the April 2015 ***Underground Storage Tanks Within ECP Parcel 79*** submittal, the Army has conducted adequate due diligence to assess the presence of USTs within Parcel 79, including the use of geophysical survey techniques, historical maps and metal detectors to locate USTs. Since there were no indications of USTs at these sites, the Army is not proposing additional assessment work at the above locations.

Note that Attachment V in the April 2015 ***Underground Storage Tanks Within ECP Parcel 79*** submittal provides analytical data for UST 445, not UST 455 as noted above. There was no tank removed or analytical data collected at the Building 455 location; however, the Army removed an UST and collected analytical data in support of closure at UST 445. Therefore, we request that NJDEP re-evaluate UST/Bldg. No. 445 as described in Attachment V of the April 2015 ***Underground Storage Tanks Within ECP Parcel 79*** submittal. In anticipation of NJDEP's request to address a potential data need, one additional groundwater sample is proposed from a location

downgradient of UST 445 to assess the potential for impact to groundwater, as described in the attached ***Parcel 79 Work Plan Addendum***.

Although Building 433 was not specifically mentioned in the above comment, the Army has no record or geophysical evidence of an UST at former Building 433, and therefore the Army is not proposing additional assessment work at the Building 433 location.

B4. COMMENT: *While not indicated as present on the 1956 Fuel Storage map, nor found during geophysical survey activities, the 2014 ECP UHOT Report indicates a potential for the presence of an UST at several additional locations. Although no tank was found, insufficient information (sampling) has been submitted to allow for comment as to the presence or absence of a discharge for the following:*

UST/Bldg. No. 170 (Attachment I)
UST/Bldg. No. 171 (Attachment I)
UST/Bldg. No. 408
UST/Bldg. No. 436
UST/Bldg. No. 468

B4. RESPONSE: Comment acknowledged. As discussed in the April 2015 ***Underground Storage Tanks Within ECP Parcel 79*** submittal, the Army has conducted adequate due diligence to assess the presence of USTs within Parcel 79, including the use of geophysical survey techniques, historical maps and metal detectors to locate USTs. Since there were no indications of USTs at these sites, the Army is not proposing additional assessment work at the above locations. If the Army has creditable evidence of a potential release, then we will evaluate these locations to achieve regulatory acceptance and site/parcel closure. However, in absence of any new evidence, we believe that the Army has done an adequate level of due diligence.

C. <u>Attachments J, K & L – USTs at Former Building 202</u>

C1. COMMENT: *Four USTs were noted as present, and removed (although the ECP UHOT report indicates high potential for the continued presence of two USTs), at the former building, the specific locations of which two (202A & 202B), were not indicated. Although apparently no discharge was associated with USTs 202B or 202C (the submittal implies no soils were removed at either UST prior to the sampling which indicated non-detect TPH levels), discharges were associated with both USTs 202A and 202D.*

The affected soils at UST 202A were removed to 5.5', likely extending to within 2' of or into the ground water table, in this area, and contained almost 8,000 ppm TPHC, the level referenced in the Department's guidance (http://www.nj.gov/dep/srp/guidance/rs/#phc) as the residual product/free product limit. As such, it is possible former UST 202A could have contributed to the levels of ground water contamination noted at UST 202D. An NFA at this time is, therefore, not appropriate.

As indicated in the submittal, ground water was found to contain benzene at low levels, 2-methylnaphthalene, and BN TICs in a sampling event performed in June of 2011 at UST 202D. An NFA of the soils, as requested, is not appropriate at this time. Insufficient information is known relative to the ground water contamination in the area, including the current extent or levels of contamination.

C1. RESPONSE: Additional soil and groundwater sampling is proposed at former USTs 202A and 202D to assess the potential for impacts to groundwater, as described in the attached ***Parcel 79 Work Plan Addendum***. This will include sampling from existing well 202MW01, which was installed in August 2011 but apparently not yet sampled. Soil samples from 3 boring locations near the former USTs 202A and 202D, and groundwater samples from one of these borings and two existing monitor wells, will be collected as described in the attached ***Parcel 79 Work Plan Addendum***.

We respectfully request that NJDEP reconsider approving NFA for USTs 202B and 202C based on the soil results previously submitted (Attachments K and L of the April 2015 ***Underground Storage Tanks Within ECP Parcel 79***). Following tank removals, there was no requirement for contaminated soil excavation, and all TPH soil results were nondetected for each of these tank sites.

D. <u>Attachment CC/UST 490- aka UST 490-58</u>

D1. COMMENT: *Although a Site Assessment Compliance Statement and Standard Reporting Form for tank removal are reported in Attachment CC as submitted to the DEP in 1991, as indicated in the submittal, there is no record of NFA approval from the NJDEP; no soil sampling had been performed at that time.*

Soil sampling collected from the 6-6.5' interval was performed in 2005, indicating levels of TPH ranged from 2981 to 8762 ppm, with VOs below criteria. Ground water samples were below the Ground Water Quality Standards (GWQS) in effect at the time, however, no report was submitted; 2-methylnapthalene was found at 32.13 ppb. Additional sampling (actual locations of which are unclear) performed in May of 2010 (prior to phase-in of EPH), at the 3.5-4' interval – the rationale for selection of that interval is unreported – found TPH ranging from ND to 5941.76 ppm. Although the required contingency sampling was reported as exhibiting no exceedences in the submittal, the Impact to Ground Water Standard for 2-methylnaphthalene of 8 ppm was exceeded in Sample B4, with a result of 30.32 ppm. Ground water sampling conducted in May and July of 2010 found elevated levels of 2-methylnaphthalene, as well as elevated BN TICs.

No figure identifying the location of the May 2010 sampling was provided, however, it appears contamination above the 5100 ppm criterion may be present from at least the 3.5 to the 6.5' interval, and deeper. TPH/EPH cannot exceed the residual product/free product limit of 8,000 mg for No. 2 fuel; 2-methylnaphthalene above standard in the soil as well as the ground water is present. Compliance averaging of the soils is not appropriate. Additional characterization of the ground water contamination is required. The current conditions of the ground water and the extent of any contamination must be determined, at which time further decisions regarding remedial requirements may be determined.

D1. RESPONSE: Additional soil and groundwater sampling is proposed at former UST 490, as described in the attached ***Parcel 79 Work Plan Addendum***. This will include sampling from existing well 490MW01, which was installed in August 2011 but not yet sampled. Soil samples from 3 boring locations near the former UST 490, and groundwater samples from these three borings and one existing monitor well, will be collected as described in the attached ***Parcel 79 Work Plan Addendum***.

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

Sincerely,

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

Attachment:
Parcel 79 Work Plan Addendum for Former Storage Tank Sites

cc: Delight Balducci, HQDA ACSIM (e-mail)
Joseph Pearson, Calibre (e-mail)
James Moore, USACE (e-mail)
Jim Kelly, USACE (e-mail)
Cris Grill, Parsons (e-mail)

Fort Monmouth
Oceanport and Monmouth County, New Jersey
Parcel 79 Work Plan Addendum for Former Storage Tank Sites
Date: February 2016

1.0 PURPOSE

The purpose of this Parcel 79 Work Plan is to outline the site-specific Scope of Work (SOW) for the investigation of former underground storage tank (UST) and above-ground storage tanks (AST) sites within Parcel 79 at Fort Monmouth. In general, the scope consists of supplemental soil and groundwater sampling at select UST and AST sites to assess the potential for impacts to groundwater, as requested by the New Jersey Department of Environmental Protection (NJDEP) in their comment letter dated August 25, 2015. The field activities will involve:

- Advancement of approximately 10 shallow soil borings using a Geoprobe rig to depths below shallow groundwater, and collection of soil samples from select boring intervals for chemical analysis of petroleum constituents.
- Installation of temporary monitor wells within approximately 16 Geoprobe borings, and collection of "grab" groundwater samples for chemical analysis of petroleum constituents.
- Re-development and sampling of 3 existing monitor wells for chemical analysis of petroleum constituents.

Additional details on the rationale for the proposed work are provided in Parsons response to NJDEP's comment letter dated February 9, 2016.

2.0 REFERENCE DOCUMENTS

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

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

3.0 SITE BACKGROUND

Parcel 79 is located within the eastern portion of the Main Post at Fort Monmouth, just east of Oceanport Avenue (**Figure 1**). Available information for multiple USTs at Parcel 79 was previously provided to NJDEP in the Army's submittal dated April 22, 2015 and entitled *Underground Storage Tanks Within ECP Parcel 79, Fort Monmouth, New Jersey*. The NJDEP responded in their letter dated August 25, 2015 approving No Further Action (NFA) for some USTs, but requiring assessment of groundwater at other UST sites prior to determining if NFA was appropriate. NJDEP's rationale for requiring additional

groundwater assessment included the potential for soil contamination extending to within 2 ft of or into groundwater.

One round of depth-to-water measurements was previously collected from multiple existing monitor wells within Parcel 79 in October 2015 to support this supplemental field evaluation (see **Figure 2**). Groundwater flow directions are interpreted to be towards the northeast in the northern portion, towards the southeast in the southern portion, and towards the east in the central portion of Parcel 79.

4.0 SAMPLING LOCATIONS

General locations for additional sampling were identified in the Army's recent responses to NJDEP comments, and are shown on **Figure 1**. A description of the field sampling and analytical activities to be performed is presented below. A summary of the field sampling and analytical activities is presented in **Table 1**.

4.1 Area 75 Above-Ground Storage Tanks

The NJDEP (2010) guidance entitled "*Protocol For Addressing Extractable Petroleum Hydrocarbons*" specifies contingency analysis for naphthalene and 2-methylnaphthalene in the event that extractable petroleum hydrocarbon (EPH) concentrations exceed 1,000 mg/kg. In their comment letter dated August 25, 2015, NJDEP noted that contingency analysis was not previously performed for soil samples from "AST-B" that had TPH concentrations in excess of 1,000 mg/kg. Therefore, soil and groundwater from two former AST locations (AST-1 and AST-2) in Area 75 will be re-sampled to characterize the current concentrations of constituents in these areas. Additional samples are proposed at four locations (four borings and two temporary wells) as shown on **Figure 3**.

Soil samples will be collected from four Geoprobe® borings (two from the former tank centers, and two downgradient) completed to at least 4 feet below the water table to assess current concentrations and vertical extent of extractable petroleum hydrocarbons (EPH). Three soil samples will be collected from each boring. Previous surface soil samples were collected from 0 to 0.5 ft bgs, but slightly deeper near-surface soil samples will be collected to allow for the potential that some backfill was placed over the site during tank demolition. Samples will be collected from 0.5-1.0 ft bgs, from a deeper 6-inch interval that is below any field evidence of contamination to delineate vertical extent, and from the most contaminated intermediate interval encountered (between 0.5-1.0 ft bgs and the deeper vertical extent sample) based on field evidence (visual, olfactory, [photoionization detector [PID] screening). Each soil sample will be analyzed for EPH and, if necessary, for any contingency analyses (naphthalene and 2-methylnaphthalene) required by Table 2.1 of the Technical Requirements for Site Remediation.

Groundwater samples will be collected from the two Geoprobe® borings located north (downgradient) of the former AST locations, as shown on **Figure 3**. Groundwater from these locations will be sampled using temporary wells within the Geoprobe borings, and then the borings will be abandoned. Each groundwater sample will be analyzed for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) plus tentatively identified compounds (TICs), as specified in Table 2-1 of the NJAC 7:26E Technical Requirements for Site Remediation.

4.2 Multiple Parcel 79 Underground Storage Tanks

NJDEP noted that groundwater assessment was not performed for USTs 437, 440, 441, 444, 445, 448, 449 (where no tank was found), 450, and 451 (**Figure 4**), and for UST 142B (**Figure 5**). Therefore, additional sampling of groundwater is proposed from immediately downgradient of each of these former tank locations. A Geoprobe® boring will be completed to approximately 4 feet below the water table. Groundwater from these locations will be sampled using temporary wells within the Geoprobe borings, and then the borings will be abandoned. Each groundwater sample will be analyzed for VOCs and SVOCs plus TICs.

4.3 USTs 202A and 202D

NJDEP noted that groundwater assessment was not performed for USTs 202A and 202D. Therefore, additional sampling of groundwater is proposed from the vicinity of each former tank location. Soil sampling will also be performed because NJDEP commented that soil contamination encountered at UST 202A could have contributed to impacts to groundwater.

Additional Geoprobe soil sampling is proposed for three locations as shown on **Figure 6**. Each Geoprobe boring will be completed to at least 4 feet below the water table to assess current concentrations and vertical extent of EPH. Three soil samples will be collected from each boring. Samples will be collected from approximately 3.0-3.5 ft bgs (or another interval representative of clean overburden), from a deeper 6-inch interval that is below any field evidence of contamination to delineate vertical extent, and from the most contaminated intermediate interval encountered (between 3.0-3.5 ft bgs and the deeper vertical extent sample) based on field evidence (visual, olfactory, PID screening). Each soil sample will be analyzed for EPH, with additional contingency SVOC analysis for naphthalene and 2-methylnaphthalene in the event that EPH concentrations exceed 1,000 mg/kg.

Groundwater from one downgradient boring location will be sampled using a temporary well within the Geoprobe boring, and then the boring will be abandoned. This groundwater sample will be analyzed for VOCs and SVOCs plus TICs.

Existing monitor well 202MW01 was constructed by the Army at this site in 2011 to monitor groundwater contamination from the UST 202D site, but was never sampled. Well 202MW01 and downgradient well M16MW02 will be re-developed and sampled using the NJDEP low-flow purge and sample method, and analyzed for VOCs and SVOCs plus TICs.

4.4 UST 490

NJDEP noted that groundwater assessment was not performed for UST 490, and that TPH in soil exceeded the residential standard. Therefore, additional sampling of soil and groundwater is proposed at this former tank location.

Additional Geoprobe soil and groundwater sampling is proposed for three locations as shown on **Figure 7**. The purpose of the two Geoprobe locations north of Building 490 is to supplement the existing soil and groundwater analyses for delineation of TPH contamination in excess of soil and groundwater comparison criteria towards the east and north. The purpose of the third Geoprobe location south of Building 490 is for delineation of petroleum contamination in the downgradient direction (south). Each Geoprobe boring will be completed to at least 4 feet below the water table to assess current concentrations

and vertical extent of EPH. Three soil samples will be collected from each boring. Samples will be collected from approximately 2.0-2.5 ft bgs (or another interval representative of clean overburden), from a deeper 6-inch interval that is below any field evidence of contamination to delineate vertical extent, and from the most contaminated intermediate interval encountered (between 2.0-2.5 ft bgs and the deeper vertical extent sample) based on field evidence (visual, olfactory, PID screening). Each soil sample will be analyzed for EPH, with additional contingency SVOC analysis for naphthalene and 2-methylnaphthalene in the event that EPH concentrations exceed 1,000 mg/kg.

Groundwater samples from these three boring locations will be sampled using temporary wells within the Geoprobe borings, and then the borings will be abandoned. Each groundwater sample will be analyzed for VOCs and SVOCs plus TICs.

Existing monitor well 490MW01 was constructed by the Army at this site in 2011 to monitor groundwater contamination from the UST 490 site, but was never sampled. Well 490MW01 will be re-developed and sampled using the NJDEP low-flow purge and sample method, and analyzed for VOCs and SVOCs plus TICs.

5.0 OTHER ITEMS

Additional sampling of soil or groundwater may be performed to further delineate the extent of contamination in excess of applicable regulatory levels, based on the results of the sampling proposed in Section 4.0.

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

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

BOB MARTIN
Commissioner

August 25, 2015

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

Re: *Underground Storage Tanks Within ECP Parcel 79 dated April 2015*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Occhipinti:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced report, received April 28, 2015, prepared by Department of the Army Office of Assistant Chief of Staff for Installation Management to provide responses to NJDEP letters of July 10, 2012 and May 30, 2013, and to provide a comprehensive documentation of the location and "closure status" of USTs identified within ECP Parcel 79.

Identification of the USTs in the submittal was made based upon review of historic records as well as the past performance of various geophysical/magnetometer surveys. As indicated in the report (and substantiated in Attachment D), twenty nine (29) USTs have previously received a designation of No Further Action (NFA) necessary from the Department. The submittal (page 7 of 7) proposes sufficient activity has taken place to allow for NFA of the entire Parcel 79 with the exception of an unused UST at Building 446 (which apparently did not undergo sampling) and the ground water at two of the USTs (UST 202D and UST 490), however, this office does not agree with same, and additional comment is warranted.

Attachment E -Areas 74 & 75 – Aboveground Storage Tanks & Associated Piping

Area 75 – Aboveground Storage Tanks

Two 210,000 gallon aboveground storage tanks, utilized from the 1940s through the 1980s, were removed in May of 1995. Based upon a review of the analytical results and chain of custody

(COC) as well as a conversation with Joe Fallon this date, who collected the samples, it appears 13 samples were collected in the proximity of AST A – all analytical results were below 1000 ppm, and 15 samples in the proximity of AST B. Per Mr. Fallon, the samples would have been collected both at/along the perimeter and within the footprint/center of the former ASTs, mainly at 0-6", but also at deeper intervals (as indicated on the COCs). Although it appears sampling frequency and location may have been adequate, it is unclear the analytical parameter requirements, either those in effect at the time of sampling or currently in effect, were met as regarding contingency analysis for AST B. Of the 15 samples apparently collected for AST B, 5 exceeded the trigger for additional analyses on 25% of those exceeding 1000 ppm (VOs+10 at the time of sampling, 2-methylnaphthalene and naphthalene per current guidance). It is also unclear where the ground water sampling points referenced for Area 74 were located relative to the former ASTs of Area 75?

Area 74 – Associated Piping
As per Enclosure 4 of Attachment E, the underground piping was previously NFAed.

Underground Storage Tanks

In addition to those USTs previously granted a designation of NFA, it is agreed no further action is necessary for the following #2 fuel USTs:

UST 29-1 – 1000 gallon steel
UST 142A – 1000 gallon steel; C93-3714
UST 401-26 – 1000 gallon steel
UST 416-32 – 1000 gallon steel
UST 430B-45 – 550 gallon tank*; C93-3987
*note – page 1, Section 1.1 and scrap receipt each indicate UST was steel; Att B states fiberglass
UST 443-49 – 1080 gallon steel
UST 474 – 1000 gallon steel

Although the 2008 Site Investigation previously performed did include ground water sampling, a review of the sampling points did not indicate they were placed within distances sufficient to allow for adequate evaluation of the USTs referenced below. Based upon soil contamination extending to within 2' of, and in many cases, into the ground water table (GWT), a ground water investigation is necessary at the following UST locations (the elimination of the sheen via excavation, as referenced for USTs 441, 444 is insufficient):

UST 142B (Attachment H)
UST 437 (Attachment Q)
UST 440 (Attachment R)
UST 441 (Attachment S)
UST 444 (Attachment U)
UST 448 (Attachment W); please specify if well P79-E2 is sufficiently proximate to comply with regulations/guidance
UST 449 (Attachment X)

UST 450 (Attachment Y)
UST 451 (Attachment Z)

Though it is understood no evidence was found of a tank remaining in the below referenced locations during geophysical or trenching activities, a tank was noted as present in historic Army material, e.g. 1956 Fuel Storage Map, while Attachment 1 indicates heating oil USTs may remain between Tilly Avenue and Leonard Avenue. No soil sampling was apparently performed in any of these locations. Unless all tanks, former or current, have been evaluated in accordance with the applicable Departmental regulations and guidance documents, the NJDEP cannot comment as to the absence or presence of a petroleum discharge. The request on page 7 of 7 for designation of an NFA for the following USTs cannot be granted unless the necessary sampling is performed at each:

UST/Bldg. No. 168 (Attachment I)
UST/Bldg. No. 169 (Attachment I)
UST/Bldg. No. 407
UST/Bldg. No. 415
UST/Bldg. No. 424
UST/Bldg. No. 425
UST/Bldg. No. 435 (Attachment P)
UST/Bldg. No. 438
UST/Bldg. No. 442
UST/Bldg. No. 455 (Attachment V)
UST/Bldg No. 456 (Attachment AA consisted of only analytical data, from a single sample - 6-12"; information provided is insufficient for evaluation/comment)
USTs/Bldg. No.s 457 through 467
UST/Bldg. No.s 469 through 473
UST/Bldg. No. 476
UST/Bldg. No. 488
UST/Bldg. No. 489

While not indicated as present on the 1956 Fuel Storage map, nor found during geophysical survey activities, the 2014 ECP UHOT Report indicates a potential for the presence of an UST at several additional locations. Although no tank was found, insufficient information (sampling) has been submitted to allow for comment as to the presence or absence of a discharge for the following:

UST/Bldg. No. 170 (Attachment I)
UST/Bldg. No. 171 (Attachment I)
UST/Bldg. No. 408
UST/Bldg. No. 436
UST/Bldg. No. 468

Attachments J, K & L – USTs at Former Building 202

Four USTs were noted as present, and removed (although the ECP UHOT report indicates high potential for the continued presence of two USTs), at the former building, the specific locations of which two (202A & 202B), were not indicated. Although apparently no discharge was associated with USTs 202B or 202C (the submittal implies no soils were removed at either UST prior to the sampling which indicated non-detect TPH levels), discharges were associated with both USTs 202A and 202D.

The affected soils at UST 202A were removed to 5.5', likely extending to within 2' of or into the ground water table, in this area, and contained almost 8,000 ppm TPHC, the level referenced in the Department's guidance (http://www.nj.gov/dep/srp/guidance/rs/#phc) as the residual product/free product limit. As such, it is possible former UST 202A could have contributed to the levels of ground water contamination noted at UST 202D. An NFA at this time is, therefore, not appropriate.

As indicated in the submittal, ground water was found to contain benzene at low levels, 2-methylnaphthalene, and BN TICs in a sampling event performed in June of 2011 at UST 202D. An NFA of the soils, as requested, is not appropriate at this time. Insufficient information is known relative to the ground water contamination in the area, including the current extent or levels of contamination.

Attachment CC/UST 490- aka UST 490-58

Although a Site Assessment Compliance Statement and Standard Reporting Form for tank removal are reported in Attachment CC as submitted to the DEP in 1991, as indicated in the submittal, there is no record of NFA approval from the NJDEP; no soil sampling had been performed at that time.

Soil sampling collected from the *6-6.5' interval* was performed in 2005, indicating levels of TPH ranged from 2981 to 8762 ppm, with VOs below criteria. Ground water samples were below the Ground Water Quality Standards (GWQS) in effect at the time, however, no report was submitted; 2-methylnapthalene was found at 32.13 ppb. Additional sampling (actual locations of which are unclear) performed in May of 2010 (prior to phase-in of EPH), at the *3.5-4' interval* – the rationale for selection of that interval is unreported - found TPH ranging from ND to 5941.76 ppm. Although the required contingency sampling was reported as exhibiting no exceedences in the submittal, the Impact to Ground Water Standard for 2-methylnaphthalene of 8 ppm was exceeded in Sample B4, with a result of 30.32 ppm. Ground water sampling conducted in May and July of 2010 found elevated levels of 2-methylnaphthalene, as well as elevated BN TICs.

No figure identifying the location of the May 2010 sampling was provided, however, it appears contamination above the 5100 ppm criterion may be present from at least the 3.5 to the 6.5' interval, and deeper. TPH/EPH cannot exceed the residual product/free product limit of 8,000 mg for No. 2 fuel; 2-methylnaphthalene above standard in the soil as well as the ground water is

present. Compliance averaging of the soils is not appropriate. Additional characterization of the ground water contamination is required. The current conditions of the ground water and the extent of any contamination must be determined, at which time further decisions regarding remedial requirements may be determined..

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

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

DEPARTMENT OF THE ARMY

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

April 22, 2015

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

Re: Underground Storage Tanks within Parcel 79
Fort Monmouth, NJ

Attachments:

A. Correspondence
B. Summary Table of Parcel 79 Underground Storage Tanks
C. Site Layout Drawings of Parcel 79 (Recent and Historical)
D. No Further Action Letters from NJDEP
E. Areas 74 and 75 ASTs File Review and Analyses
F. UST 29 File Review
G. UST 142A Report
H. UST 142B Report
I. Bldgs. 168, 169, 170 and 171 File Review
J. UST 202A File Review
K. UST 202B File Review
L. USTs 202C and 202D File Reviews and Report
M. UST 401 Report
N. UST 416 Report
O. UST 430B Report
P. UST 435 Notes
Q. UST 437 File Review and Analyses
R. UST 440 File Review and Analyses
S. UST 441 File Review and Analyses
T. UST 443 Report
U. UST 444 File Review and Analyses
V. UST 445 File Review and Analyses
W. UST 448 File Review and Analyses
X. UST 449 File Review and Analyses
Y. UST 450 File Review and Analyses
Z. UST 451 File Review and Analyses
AA. Bldg. 456 Analyses
BB. UST 474 File Review and Analyses
CC. UST 490 File Review, Report and Analyses

DD. Geophysical Survey Report

Previous Correspondence (provided in Attachment A):

1. NJDEP letter to the Army dated July 10, 2012, re: *March 2012 Army Response to NJDEP Correspondence Letter Dated October 28, 2008*.
2. Army letter to NJDEP dated January 31, 2013, re: *NJDEP's Response to Army Correspondence (Dated March 16, 2012).*
3. NJDEP letter to the Army dated May 30, 2013, re: *Army's January 31, 2013 Correspondence – Miscellaneous USTs.*

Dear Ms. Range:

The U.S. Army Fort Monmouth (FTMM) has reviewed existing file information for underground storage tank (UST) sites at Fort Monmouth within Environmental Condition of Property (ECP) Parcel 79. One purpose of this review was to provide a comprehensive response to NJDEP's previous comments on Parcel 79 (Correspondence 1); these responses (Attachment A) supplement the information previously provided in Correspondence (2) and (3). In addition, this submittal provides comprehensive documentation of the location and closure status of all USTs identified within this parcel, which we believe will be useful for the future Phase II property transfer.

Responses to NJDEP's comments concerning Parcel 79 in Correspondence (1) are provided in Attachment A, as well as the previous correspondence concerning Parcel 79 (Correspondence 1 through 3). The majority of the removed and potential USTs were used for residential heating oil, or were less than 2000 gallons in size and used to store heating oil for nonresidential buildings, and are therefore considered unregulated heating oil tanks (UHOTs). A summary table of UHOTs identified within Parcel 79 is provided as Attachment B, and the locations of these UHOTs within Parcel 79 are presented in Attachment C. All but one of the UHOTs that have been positively identified within Parcel 79 have been removed; the exception is UST 446, which was left in place as described further below. Additional "potential" UHOTs associated with former barracks (as shown on historical drawings; see Attachment C) are also described in this summary that have not been located. The table of UHOTs in Attachment B describes which UHOTs were identified by each of the relevant sources of information, including the Addendum ECP UHOT Report (Parsons, 2014), the 1956 fuel storage tanks map (presented in Attachment C; also previously provided as Appendix O of the 2007 ECP Report, and within Appendix G of the ECP Site Investigation Report), and NJDEP's July 10, 2012 letter (Correspondence 1).

Multiple UHOTs within Parcel 79 have been identified that were previously approved for No Further Action (NFA) by NJDEP; documentation of this approval is provided in Attachment D, and referenced below for specific UHOTs. In these cases, there is generally a supporting investigation report that was previously submitted to NJDEP and that describes the basis for closure. For the sake of brevity, we have not included these reports for UHOTs where NFA has already been approved. However, these reports are available within the FTMM environmental records.

In the Attachment B table, the term "Case Closed" has been used (consistent with previous FTMM procedures) to indicate the Army determined that no further sampling or remedial actions were warranted for a specific UST site. "Case Open" indicates the Army determined that

ongoing monitoring, reporting or possibly even remedial action was warranted. In contrast, "No Further Action" has been reserved for NJDEP approval that no further sampling or remedial actions are warranted. “Case Open” sites previously identified within Parcel 79 in Attachment B can now be considered as “Closed” by this submittal.

The Parcel 79 area generally includes that portion of Fort Monmouth bounded by Parker Creek to the northwest, Oceanport Avenue to the southwest, Oceanport Creek to the southeast, and Burns Avenue (and its southerly extension) to the northeast (see Attachment C). Several discrete areas that are designated as Installation Restoration Program (IRP) sites or as separate ECP parcels are also located within the same general area as Parcel 79, but are excluded from this submittal. These excluded sites are shown on Attachment C and include:

- FTMM-15 Water Tank, also known as Parcel 78.
- FTMM-16 Former Pesticide Storage Area (Bldg. 498), also known as Parcel 81.
- Parcel 80 Former Bldgs. 105 and 106.
- Parcel 82 Residential Communities Initiative (RCI) 400 Area.
- Parcel 95 PCB Transformer Leak near Bldgs. 454 and 456.

These excluded IRP sites and ECP Parcels will be addressed under separate cover as needed.

Bulk fuel oil aboveground storage tanks (ASTs) were previously located in the northeastern portion of Parcel 79 (see the current layout drawing in Attachment C). The two 210,000 gallon fuel oil ASTs were removed in 1995, and associated piping was removed in 1997. Soil samples were collected both for the AST site (designated as Area 75) and the associated piping (designated as Area 74), as well as groundwater samples for Area 74. A file review summary and the results of the investigations are presented in Attachment E. Based upon the results of the analyses, we request No Further Action for this Area 74 and 75 AST site.

Regarding the multiple USTs that were previously removed from Parcel 79, we are submitting the following documentation, and we request a No Further Action determination for each site (site that have been previously approved by NJDEP are highlighted in green):

- UST 29 File Review summary and analyses is presented in Attachment F.
- UST 104 NFA was approved by NJDEP on 1/10/2003 (Attachment D).
- UST 142A investigation report is presented in Attachment G.
- UST 142B investigation report is presented in Attachment H.
- Bldgs. 168, 169, 170 and 171 File Review is presented in Attachment I; these are demolished buildings where USTs are not likely to be present.
- UST 197-2 NFA was approved by NJDEP on 2/24/2000 (Attachment D).
- UST 202A File Review is presented in Attachment J.
- UST 202B File Review is presented in Attachment K.
- UST 202C File Review and Report are presented in Attachment L.
- UST 202D File Review summary, report and additional analyses are presented in Attachment L. NFA for soils at this site is warranted. Benzene and 2-methylnaphthalene in groundwater exceeded the NJDEP Ground Water Quality Criteria.
- UST 400 NFA was approved by NJDEP on 2/24/2000 (Attachment D).
- UST 401 investigation report is presented in Attachment M.
- Bldg. 407 is a demolished building where there were no geophysical survey indications of an underground storage tank found.

- Bldg. 408 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- UST 410 NFA was approved by NJDEP on 7/10/1998 (Attachment D).
- UST 411 NFA was approved by NJDEP on 5/30/2013 (Attachment D).
- UST 412 NFA was approved by NJDEP on 8/29/2000 (Attachment D).
- UST 413 NFA was approved by NJDEP on 8/29/2000 (Attachment D).
- UST 414 NFA was approved by NJDEP on 8/29/2000 (Attachment D).
- Bldg. 415 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- UST 416 investigation report is presented in Attachment N.
- UST 417 NFA was approved by NJDEP on 8/29/2000 (Attachment D).
- UST 418 NFA was approved by NJDEP on 7/10/1998 (Attachment D).
- UST 419 NFA was approved by NJDEP on 8/29/2000 (Attachment D).
- UST 420 NFA was approved by NJDEP on 7/10/1998 (Attachment D).
- UST 421 NFA was approved by NJDEP on 5/30/2013 (Attachment D).
- UST 422 NFA was approved by NJDEP on 7/10/1998 (Attachment D).
- UST 423 NFA was approved by NJDEP on 5/30/2013 (Attachment D).
- Bldg. 424 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Bldg. 425 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- UST 426 NFA was approved by NJDEP on 1/10/2003 (Attachment D).
- UST 427 NFA was approved by NJDEP on 7/10/1998 (Attachment D).
- UST 428 NFA was approved by NJDEP on 8/29/2000 (Attachment D).
- UST 429 NFA was approved by NJDEP on 10/23/2000 (Attachment D).
- UST 430A NFA was approved by NJDEP on 7/10/1998 (Attachment D).
- UST 430B investigation report is presented in Attachment O.
- UST 430C NFA was approved by NJDEP on 2/24/2000 (Attachment D).
- Bldg. 433 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- UST 434 NFA was approved by NJDEP on 8/29/2000 (Attachment D).
- Bldg. 435 is a demolished building where there were no geophysical survey indications of an underground storage tank found; test trenching was performed as described in Attachment P; no tank was found.
- Bldg. 436 is a demolished building where there were no geophysical survey indications of an underground storage tank found; field studies were performed that discovered USTs at other locations in this general area, but no tank was found at this location.
- UST 437 File Review and Analyses is presented in Attachment Q.
- Bldg. 438 is a demolished building where there were no geophysical survey indications of an underground storage tank found; field studies were performed that discovered USTs at other locations in this general area, but no tank was found at this location.
- UST 439 NFA was approved by NJDEP on 8/29/2000 (Attachment D).
- UST 440 File Review and Analyses is presented in Attachment R.
- UST 441 File Review and Analyses is presented in Attachment S.

- Bldg. 442 is a demolished building where there were no geophysical survey indications of an underground storage tank found; field studies were performed that discovered USTs at other locations in this general area, but no tank was found at this location.
- UST 443 investigation report is presented in Attachment T.
- UST 444 File Review and Analyses is presented in Attachment U.
- UST 445 File Review and Analyses is presented in Attachment V.
- UST 446 is a steel 1000 gallon fuel oil tank that was partially excavated in 2010, but was left in place because it was partially covered by the existing Bldg. 451 foundation, and therefore could not be removed without damaging the overlying structure.
- UST 447 NFA was approved by NJDEP on 8/29/2000 (Attachment D).
- UST 448 File Review and Analyses is presented in Attachment W.
- UST 449 File Review and Analyses is presented in Attachment X.
- UST 450 File Review and Analyses is presented in Attachment Y.
- UST 451 File Review and Analyses is presented in Attachment Z.
- UST 453 NFA was approved by NJDEP on 7/10/1998 (Attachment D).
- UST 454 NFA was approved by NJDEP on 7/10/1998 (Attachment D).
- Bldg. 455 is a demolished building where there were no geophysical survey indications of an underground storage tank found. Note that this is a different location than existing Bldg. 455.
- Bldg. 456 is a demolished building where there were no geophysical survey indications of an underground storage tank found. Note that existing Bldg. 456 partially overlies this former Bldg. 456. A single soil sample was collected at Bldg. 456 as presented in Attachment AA.
- Bldg. 457 is a demolished building where there were no geophysical survey indications of an underground storage tank found. Note that existing Bldg. 455 partially overlies this former Bldg. 457.
- Bldg. 458 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Bldg. 459 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Former Bldg. 460 is a demolished building where there were no geophysical survey indications of an underground storage tank found. Note that existing Bldg. 456 partially overlies this former Bldg. 460.
- Bldg. 460 is an existing building where there were no geophysical survey indications of an underground storage tank found.
- Former Bldg. 461 is a demolished building where there were no geophysical survey indications of an underground storage tank found. Note that existing Bldg. 457 overlies this former Bldg. 461.
- Former Bldg. 462 is a demolished building where there were no geophysical survey indications of an underground storage tank found. Note that existing Bldg. 457 partially overlies this former Bldg. 462.
- Bldg. 463 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Bldg. 464 is a demolished building where there were no geophysical survey indications of an underground storage tank found.

- Bldg. 465 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Bldg. 466 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Bldg. 467 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Bldg. 468 is a demolished building where there were no geophysical survey indications of an underground storage tank found. Further, there is no tank shown on the 1956 fuel storage drawing (Attachment C).
- Bldg. 469 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Bldg. 470 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Bldg. 471 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Bldg. 472 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Bldg. 473 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- UST 474 File Review and Analyses is presented in Attachment BB.
- UST 475 NFA was approved by NJDEP on 10/23/2000 (Attachment D).
- Bldg. 476 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Bldg. 488 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- Bldg. 489 is a demolished building where there were no geophysical survey indications of an underground storage tank found.
- UST 490 File Review, Report and Analyses is presented in Attachment CC. NFA for soils at this site is warranted. 2-Methylnaphthalene in groundwater exceeded the NJDEP Ground Water Quality Criteria.
- UST 491 NFA was approved by NJDEP on 1/10/2003 (Attachment D).
- UST 492 NFA was approved by NJDEP on 8/29/2000 (Attachment D).

Many of the Parcel 79 UHOTs were steel fuel oil tanks associated with former barracks that have been demolished. Geophysical surveys were performed to locate potential USTs that may have remained after the buildings were removed, as described in Attachment DD. A combination of the geophysical surveys as well as the historical maps and metal detectors were used to locate multiple UHOTs within the Parcel 79 area, which were subsequently removed in 2010. However, for multiple building numbers listed in the Attachment B summary table (for example, 407, 408, etc.), there were no geophysical anomalies identified that were potentially related to underground tanks, and consequently no tanks were found at multiple locations.

Groundwater samples were collected from multiple petroleum tank sites during site investigation activities, including the Area 74 bulk fuel oil AST piping area, and USTs 29, 401, 416, and 430B. Groundwater VOC and SVOC analytes from these sites were either non-detected or detected at concentrations below the NJDEP Ground Water Quality Criteria. Groundwater samples were also collected from 8 locations within Parcel 79 during the ECP Site

Investigation (SI; Shaw, 2008); all VOC and SVOC analytes from these samples were also either non-detected or detected at concentrations below the NJDEP Ground Water Quality Criteria. An oily sheen on groundwater was observed within the tank excavations at USTs 441, 444, and 448 during 2010 removal activities; soil remediation was completed at each of these sites, which eliminated the source of the oily sheen. At UST 202D, benzene (1.61 µg/L) and 2-methylnaphthalene (233 µg/L) were present in groundwater at concentrations that exceeded the NJDEP interim Ground Water Quality Criteria (1 and 30 µg/L, respectively). At UST 490, 2-methylnaphthalene was present in groundwater at concentrations up to 115 µg/L, which exceeded the NJDEP interim Ground Water Quality Criteria of 30 µg/L. In summary, the results of previous investigations do not indicate the presence of widespread groundwater contamination at Parcel 79, although two localized areas with exceedance of NJDEP Ground Water Quality Criteria have been identified at USTs 202D and 490.

This information supports the conclusion that UST contamination issues identified within Parcel 79 have been adequately addressed by previous environmental activities. Numerous UHOT sites were identified within this Parcel and were addressed under the FTMM tank removal and assessment program over the past approximately 20 years. Three unresolved issues remain:

- One fuel oil UHOT was partially uncovered and then left in place at former Bldg. 446 due to structural concerns with the overlying Bldg. 451 foundation.
- Groundwater at UST 202D exceeded the NJDEP Ground Water Quality Criteria for benzene and 2-methylnaphthalene.
- Groundwater at UST 490 exceeded the NJDEP Ground Water Quality Criteria for 2-methylnaphthalene.

In summary, we submit that the Army has provided adequate due diligence with regards to the environmental condition of this Parcel, and we request that NJDEP approve No Further Action for Parcel 79, with the exception of the UHOT remaining at Bldg. 446, and groundwater at UST 202D and UST 490. Should you have any questions or require additional information, please contact me at (732) 380-7064 or by email at wanda.s.green2.civ@mail.mil.

Sincerely,

Wanda Green

Wanda Green
BRAC Environmental Coordinator

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

ATTACHMENT H

UST 142B Report

United States Army
Fort Monmouth, New Jersey

Underground Storage Tank Closure and Site Investigation Report

Building 142B
Main Post

NJDEP UST Registration No. 090010-73
Emergency UST Removal
Spill Case No. 94-7-21-1561-45

February 1997

SMITH
TECHNOLOGY CORPORATION

SMITH

UNDERGROUND STORAGE TANK CLOSURE AND SITE INVESTIGATION REPORT

BUILDING 142B

MAIN POST
NJDEP UST REGISTRATION NO. 090010-73
EMERGENCY UST REMOVAL
SPILL CASE NO. 94-7-1561-45

FEBRUARY 1997

PROJECT NO. 09-5004-08
CONTRACT NO. DACA51-94-D-0014

PREPARED FOR:

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

PREPARED BY:

SMITH TECHNOLOGY CORPORATION
BROMLEY CORPORATE CENTER
THREE TERRI LANE
BURLINGTON, NEW JERSEY 08016

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Following Page No.

TABLES

SMITH

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SMITH

EXECUTIVE SUMMARY

UST Closure

On July 21, 1994, a steel underground storage tank (UST) was closed by removal in accordance with the New Jersey Department of Environmental Protection (NJDEP) at U.S. Army Fort Monmouth, Fort Monmouth, New Jersey. The UST was discovered during decommissioning of 090010-13 at Building 142A. The UST was found to be located immediately adjacent to Building 142B in the Main Post area of U.S. Army, Fort Monmouth. The UST was removed as an emergency since it was not previously registered with the NJDEP nor previously known to exist. The UST was later registered with the NJDEP on September 14, 1994, and was assigned registration No. 090010-73. UST No. 090010-73 was a 550-gallon No. 2 fuel oil UST. The UST fill port was located directly above the tank. The tank closure was performed by Cleaning Up The Environment Inc. (CUTE Inc.).

Site Assessment

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.* Soils surrounding the tank were screened visually and with air monitoring equipment for evidence of contamination. Following removal, the UST was inspected for corrosion holes. Holes were noted in the UST and evidence of potentially contaminated soil was observed surrounding the tank.

On July 21, 1994, following the removal of the UST, approximately 30 cubic yards of potentially contaminated soils was removed from the excavation due to visible contamination. Post-excavation soil samples A, B, C, D, E, F, and DUP A were collected from a total of six (6) locations along the sidewalls of the excavation. The samples were collected at a depth of 5.5 feet below ground surface (bgs). All samples were analyzed for total petroleum hydrocarbons (TPHC). No fuel lines were found during the emergency removal of UST No. 090010-73.

Based on the inspection of the UST, and field screening of subsurface soils, the DPW has concluded that an historical discharge was associated with the UST. On July 21, 1994, a spill was reported to the NJDEP "Hotline" for UST No. 090010-73 and was assigned Spill Case No. 94-7-21-1561-45.

Findings

All post-excavation soil samples collected from the UST excavation at Building 142B contained TPHC concentrations below the NJDEP residential direct contact total organic contaminants soil cleanup criteria of 10,000 milligrams per kilogram (mg/kg) (N.J.A.C. 7:26D and revisions dated

February 3, 1994). All samples (samples A, B, C, D, E, F, and DUP A) contained non-detectable concentrations of TPHC.

Site Restoration

Following receipt of all post-excavation soil sampling results, the excavation was backfilled to grade with a combination of uncontaminated excavated soil and certified clean fill. The excavation site was then restored to its original condition.

Site Assessment Quality Assurance

The sampling and laboratory analysis conducted during the site assessment were performed in accordance with Section 7:26E-2.1 of the *Technical Requirements for Site Remediation.*

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.

Conclusions and Recommendations

Based on the post-excavation soil sampling results, soils with TPHC concentrations exceeding the NJDEP soil cleanup criteria for total organic contaminants of 10,000 mg/kg, do not exist in the former location of the UST.

No further action is proposed in regard to the closure and site assessment of UST No. 090010-73 at Building 142B.

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1.0 UNDERGROUND STORAGE TANK DECOMMISSIONING ACTIVITIES

1.1 OVERVIEW

One underground storage tank (UST), was closed at Building 142B at U.S. Army Fort Monmouth, Fort Monmouth, New Jersey on July 21, 1994. Refer to site location map on Figure 1. The UST was discovered during decommissioning of UST No. 090010-13 at Building 142A. The UST was found to be located immediately adjacent to Building 142B in the Main Post area of U.S. Army, Fort Monmouth. The UST was removed as an emergency since it was not previously registered with the NJDEP nor previously known to exist. The UST was registered with the NJDEP on September 14, 1994 and was assigned registration No. 090010-73. The UST was a steel 550-gallon tank containing No. 2 fuel oil.

Decommissioning activities for UST No. 090010-73 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 & 1910.120. All permits including but not limited to the NJDEP-approved Decommissioning/Closure Plan were posted onsite for inspection. CUTE Inc., the contractor that conducted the decommissioning activities, is registered and certified by the NJDEP for performing UST closure activities. Closure of UST No. 090010-73 proceeded under the approval of the NJDEP Bureau of Underground Storage Tanks (NJDEP-BUST). The signed certifications for UST No. 090010-73 are included in Appendix A.

Based on an inspection of the UST, and field screening of subsurface soils, the DPW has concluded that an historical discharge was associated with the UST. On July 21, 1994, a spill was reported to the NJDEP "Hotline" for UST No. 090010-73 and was assigned Spill Case No. 94-7-21-1561-45.

This UST Closure and Site Investigation Report has been prepared by Smith Technology Corporation, to assist the United States Army Directorate of Public Works (DPW) in complying with the NJDEP Bureau of Underground Storage Tanks (NJDEP-BUST) regulations. The applicable NJDEP-BUST 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. September 1990 and revisions dated November 1, 1991).

This report was prepared using information required 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 investigation, are presented in the final section of this report.

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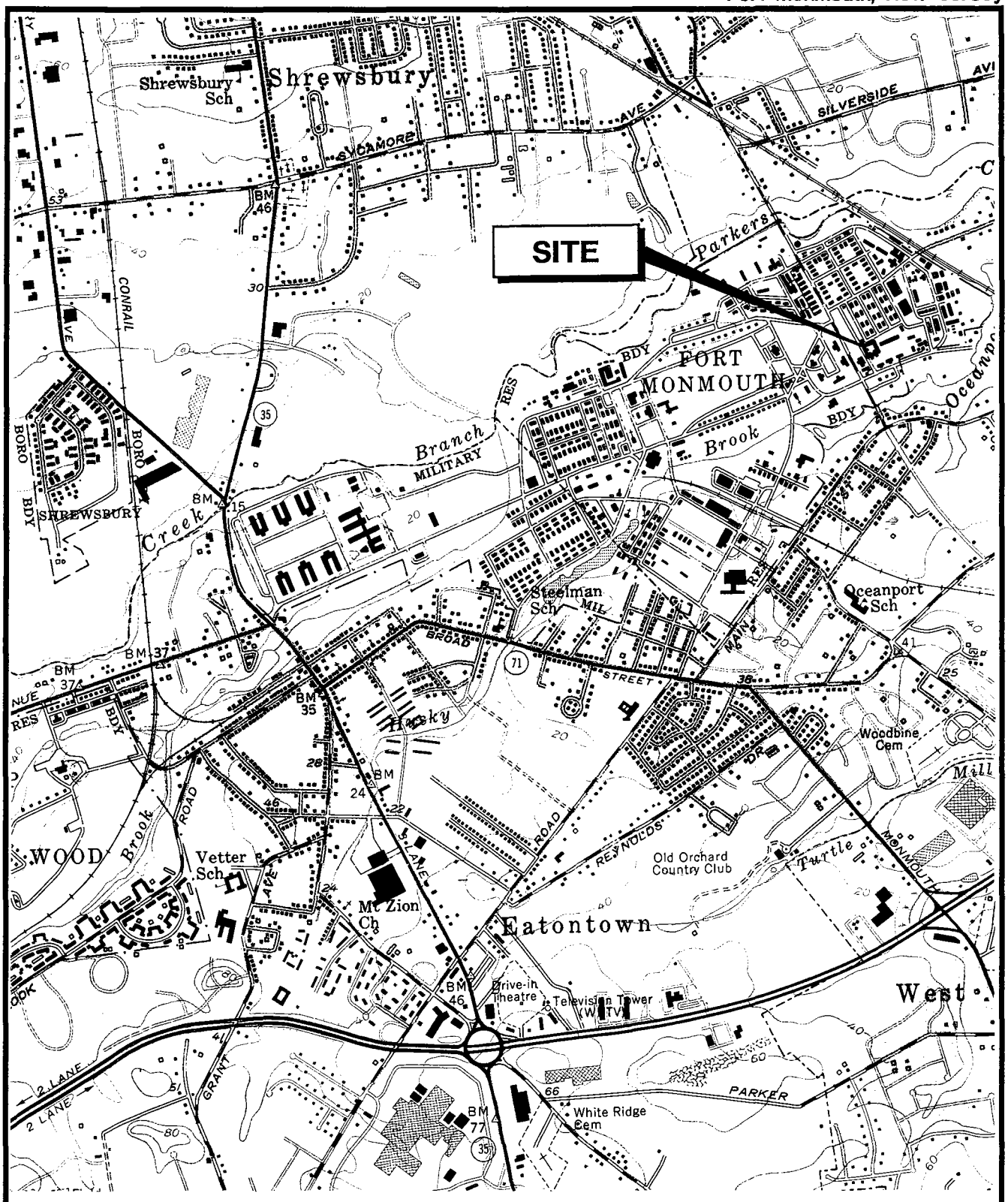
U.S. Army
Department of Public Works
Fort Monmouth, New Jersey



Source: Long Branch, New Jersey Quadrangle

Project No. 09-5004-08

Figure 1
Site Location Map
Building 142B

1.2 SITE DESCRIPTION

Building 142B is located in the northeastern portion of the Main Post area of Fort Monmouth, as shown on Figure 1. UST No. 090010-73 was located east of Building 142B. The fill port area was located directly above the tank, however, no fuel lines were found upon removal of the UST. A site map is provided on Figure 2.

1.2.1 Geological/Hydrogeological Setting

The following is a description of the geological/hydrogeological setting of the area surrounding Building 142B. 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 (Zapecza, 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. Over 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 Zapecza, 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

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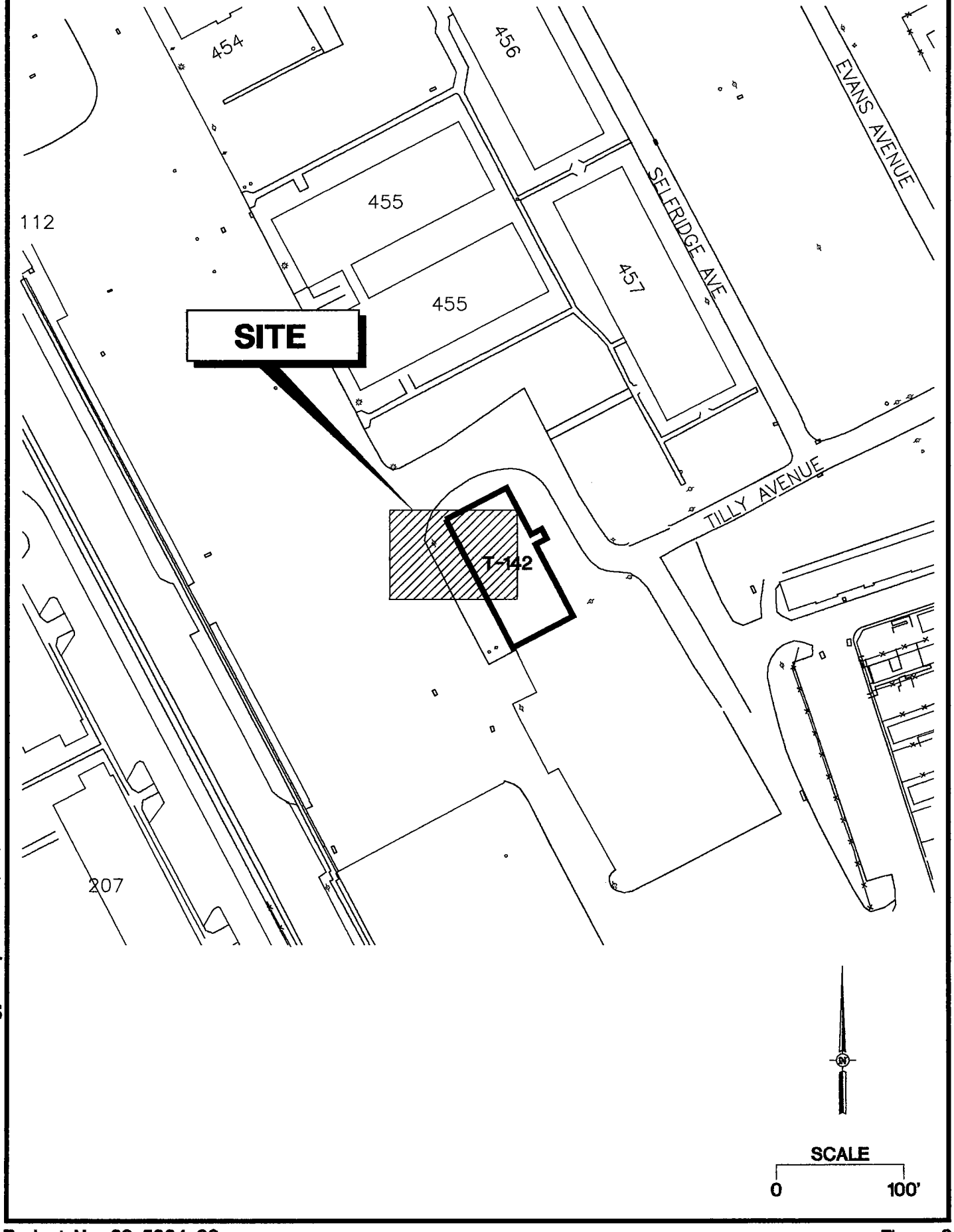
Department of Public Works
Fort Monmouth, New Jersey



Source: Smith Technology Corporation (110)

Project No. 09-5004-08

Figure 2
Building T-142B
Site Map

(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 a 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.

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 involve 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

- All underground obstructions (utilities, etc.) were marked out by the contractor performing the closure prior to excavation activities.
- 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 OVA for evidence of contamination. Potentially contaminated soils were identified and logged during closure activities.
- Surface materials (i.e., asphalt, concrete, etc.) were excavated and staged separately from all soil and recycled in accordance with all applicable regulations and laws.
- A Sub-Surface 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 UST and associated piping. All free product present in the piping was drained into the UST, and the UST was purged to remove vapors prior to cutting and removal of the piping. After removal of the associated piping, a manway was made in the UST to allow for proper cleaning. The UST was completely emptied of all liquids prior to removal from the ground. Approximately 922 gallons of liquid were transported by Freehold Cartage Inc. to Lionetti Oil Recovery Co. Inc., a NJDEP-approved petroleum recycling and disposal company located in Old Bridge, New Jersey. Refer to Appendix B for the waste manifest (NJA-1603196).

The UST was cleaned prior to removal from the excavation in accordance with the NJDEP-BUST regulations. After the UST was removed from the excavation, it was staged on polyethylene sheeting and examined for holes. Holes were observed in the UST during the inspection by the Sub-Surface Evaluator. Soils surrounding the UST were screened visually and with an OVA for evidence of contamination. Evidence of potentially contaminated soil was observed surrounding the tank.

1.5 UNDERGROUND STORAGE TANK TRANSPORTATION AND DISPOSAL

The tank was transported by CUTE Inc. to Mazza and Sons Inc. for disposal in compliance with all applicable regulations and laws. See Appendix C for UST Disposal Certificate.

The removal contractor labeled the UST prior to transport with the following information:

- site of origin
- contact person
- NJDEP UST Facility ID number
- name of transporter/contact person
- destination site/contact person

1.6 MANAGEMENT OF EXCAVATED SOILS

Based on visual observations, approximately 30 cubic yards of soil was removed from the excavation on July 21, 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 hazardous storage area on Main Post prior to ultimate disposal at Soil Remediation of Philadelphia. Soils that did not exhibit signs of contamination were used as backfill following removal of the UST.

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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 Sub-Surface Evaluator according to the methods described in the NJDEP *Field Sampling Procedures Manual* (1992). Sampling frequency and parameters analyzed complied with he NJDEP-BUST document *Interim Closure Requirements for Underground Storage Tank Systems* (September 1990 and revisions dated November 1, 1991) which was the applicable regulation at the date of the closure. All records of the Site Investigation activities are maintained by the Fort Monmouth DPW Environmental Office.

The following Parties participated in Closure and Site Investigation Activities.

- Closure Contractor: Cleaning Up The Environment Inc. (CUTE Inc.)
  Closure Supervisor: George Bernotsky
  Phone Number: (201) 427-2881
  NJDEP Certification No.: 3249

- Subsurface Evaluator: Dinkerrai M. Desai
  Employer: U.S. Army, Fort Monmouth
  Phone Number: (908) 532-1475
  NJDEP Certification No.: E0002266

- Analytical Laboratory: U.S. Army Fort Monmouth Environmental Laboratory
  Contact Person: Brian K. McKee
  Phone Number: (908) 532-4359
  NJDEP Company Certification No.: 13461

- Hazardous Waste Hauler: Freehold Cartage Inc.
  Contact Person: Barry Olsen
  Phone Number: (908) 721-0900
  NJDEP Hazardous Waste Hauler No.: 2265

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. Soils were removed from the excavation until no evidence of contamination remained.

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2.3 SOIL SAMPLING

On July 21, 1994, post-excavation soil samples A, B, C, D, E, F, and DUP A were collected from a total of six (6) locations along the sidewalls of the excavation, at a depth of 5.5 feet below ground surface (bgs). No fuel lines were found during the removal of the UST.

The site assessment was performed by U.S. Army personnel 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 polystyrene scoops. Actual soil TPHC values may be higher than reported, due to sample utensil absorbency. If absorbency resulted in reducing the actual soil TPHC concentration by 50 percent, the highest soil contaminant would still have been non-detectable. 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.

TABLE 1
PAGE 1 OF 1

SUMMARY OF SAMPLING ACTIVITIES
BUILDING 142B, MAIN POST
FORT MONMOUTH, NEW JERSEY

Sample ID	Date of Collection	Matrix	Sample Type	Analytical Parameters (and USEPA Methods) *	Sampling Method
A	7/21/94	Soil	Post-Excavation	TPHC	Polystyrene Scoop
B	7/21/94	Soil	Post-Excavation	TPHC	Polystyrene Scoop
C	7/21/94	Soil	Post-Excavation	TPHC	Polystyrene Scoop
D	7/21/94	Soil	Post-Excavation	TPHC	Polystyrene Scoop
E	7/21/94	Soil	Post-Excavation	TPHC	Polystyrene Scoop
F	7/21/94	Soil	Post-Excavation	TPHC	Polystyrene Scoop
Dup A	7/21/94	Soil	Post-Excavation	TPHC	Polystyrene Scoop

* Note:
TPHC Total Petroleum Hydrocarbons (Method 418.1 / soil and aqueous)

Smith Technology Corporation (Project No. 09-5004-08)

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3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 SOIL SAMPLING RESULTS

To evaluate soil conditions following removal of the UST, post-excavation soil samples were collected from a total of six (6) locations on July 21, 1994. All samples were analyzed for TPHC. The post-excavation sampling results were compared to the NJDEP residential direct contact total organic contaminants soil cleanup criteria of 10,000 mg/kg (N.J.A.C. 7:26D and revisions dated February 3, 1994). A summary of the analytical results and comparison to the NJDEP soil cleanup criteria is provided in Table 2 and the soil sampling results are shown on Figure 3. The analytical data package is provided in Appendix D.

All post-excavation soil samples collected on July 21, 1994, from the UST excavation contained concentrations of TPHC below the NJDEP soil cleanup criteria. All post-excavation soil samples collected on July 21, 1994 contained non-detectable concentrations of TPHC.

3.2 CONCLUSIONS AND RECOMMENDATIONS

The analytical results for all post-excavation soil samples collected from the UST closure excavation at Building 142B were below the NJDEP soil cleanup criteria for total organic contaminants.

Based on the post-excavation sampling results, soils with TPHC concentrations exceeding the NJDEP soil cleanup criteria for total organic contaminants of 10,000 mg/kg, do not exist in the former location of the UST.

The existing discrepancy as listed in the Executive Summary is believed to be acceptable as explained and does not warrant further investigation or explanation. Procedures have been corrected to eliminate recurrences in the future.

No further action is proposed in regard to the closure and site assessment of UST No. 090010-73 at Building 142B.

TABLE 2
PAGE 1 OF 1

POST-EXCAVATION SOIL SAMPLING RESULTS
BUILDING 142B
FT. MONMOUTH, NEW JERSEY

Sample ID/Depth	Sample Laboratory ID	Sample Date	Analysis Date	Compound Name	Sample Quantitation Limit (mg/kg)	Compound of Concern	Result (mg/kg)	NJDEP Soil Cleanup Criteria * (mg/kg)	Exceeds Cleanup Criteria
A/5.5-6.0'	1578.1	7/21/94	7/22/94	Total Solid	--	--	83 %	--	--
				TPHC	6.6	yes	ND	10,000	--
B/5.5-6.0'	1578.2	7/21/94	7/22/94	Total Solid	--	--	84 %	--	--
				TPHC	6.6	yes	ND	10,000	--
C/5.5-6.0'	1578.3	7/21/94	7/22/94	Total Solid	--	--	79 %	--	--
				TPHC	6.6	yes	ND	10,000	--
D/5.5-6.0'	1578.4	7/21/94	7/22/94	Total Solid	--	--	88 %	--	--
				TPHC	6.6	yes	ND	10,000	--
E/5.5-6.0'	1578.5	7/21/94	7/22/94	Total Solid	--	--	82 %	--	--
				TPHC	6.6	yes	ND	10,000	--
F/5.5-6.0'	1578.6	7/21/94	7/22/94	Total Solid	--	--	84 %	--	--
				TPHC	6.6	yes	ND	10,000	--
Dup A/5.5-6.0'	1578.7	7/21/94	7/22/94	Total Solid	--	--	81 %	--	--
				TPHC	6.6	yes	ND	10,000	--

Notes:
* Cleanup criteria for total organics
-- Not applicable / does not exceed criteria
TPHC Total Petroleum Hydrocarbons

Actual soil TPHC values may be higher than reported due to absorbency by polystyrene scoops. If absorbency resulted in reducing the actual soil TPHC concentration by 50%, the highest soil contaminant would still have been non-detectable mg/kg.

Smith Technology Corporation (Project No. 09-5004-08)

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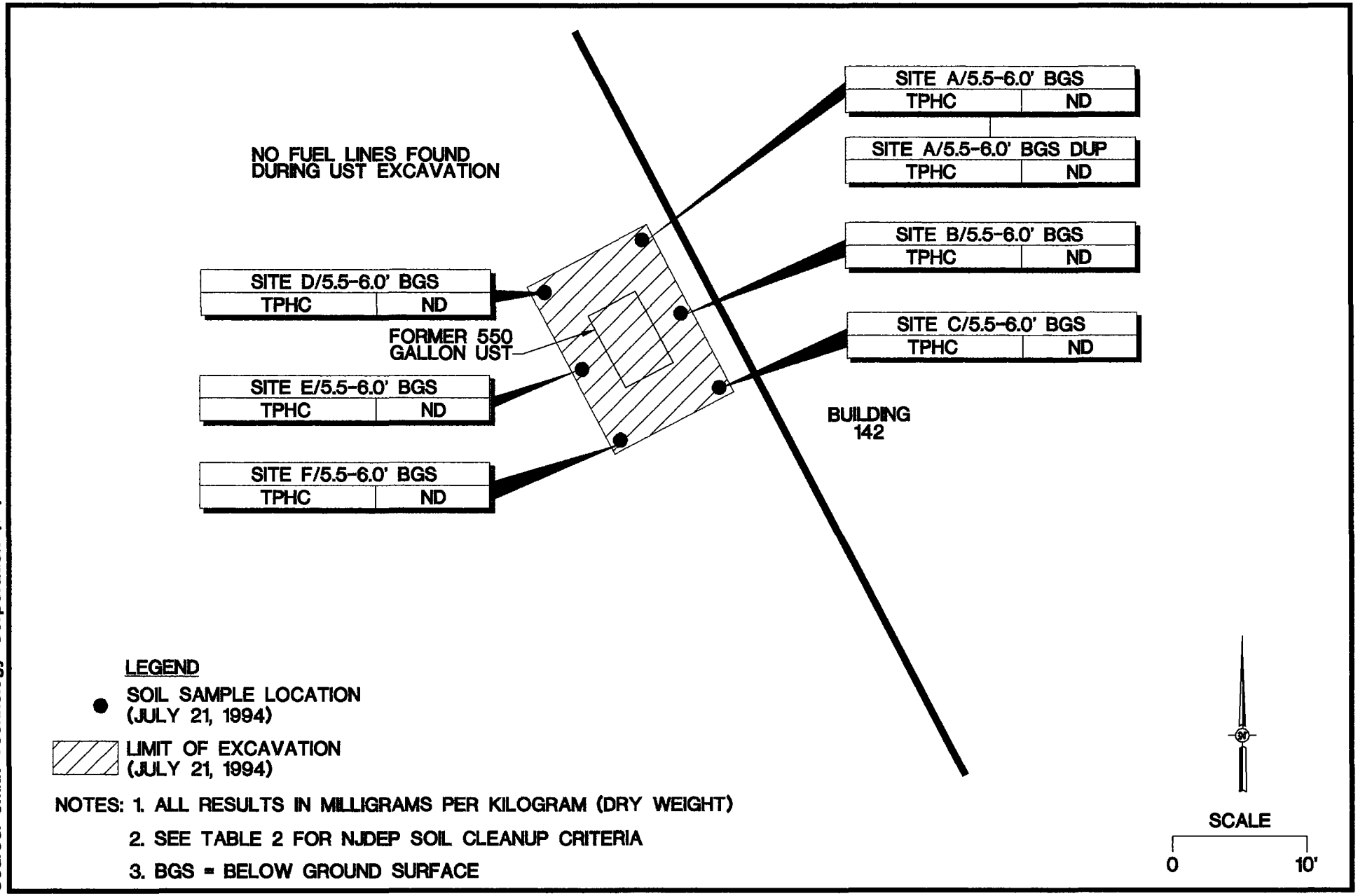
U.S. Army
Department of Public Works
Fort Monmouth, New Jersey



Source: Smith Technology Corporation (111)

Project No. 09-5004-08

Figure 3

Building 142B
Soil Sampling Results

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APPENDIX A

CERTIFICATIONS

UNDERGROUND STORAGE TANK (UST) CLOSURE CERTIFICATION

BUILDING NO. 142B

NJDEP UST REGISTRATION NO. 90010-13B (73)

DATE TANK REMOVED 7/21/94

IJO / CONTRACT NUMBER 91-0148

I CERTIFY UNDER PENALTY OF LAW THAT TANK DECOMMISSIONING ACTIVITIES WERE PERFORMED IN COMPLIANCE WITH NJAC 7:14B-9.2(b)3. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE, INACCURATE, OR INCOMPLETE INFORMATION, INCLUDING FINES AND/OR IMPRISONMENT.

NAME (Print or Type) George Bernotsky

SIGNATURE [signature]

NJDEP UST CLOSURE CERTIFICATE NO. 0003249

COMPANY PERFORMING TANK DECOMMISSIONING CUTE Inc.

NJDEP UST CLOSURE CORPORATE CERTIFICATE NO. 0200128

DATE OF SUBMITTAL 8/16/94

UST-014
2/91

FOR STATE USE ONLY
UST #
Date Rec'd.
TMS #
Staff

State of New Jersey
Department of Environmental Protection and Energy
Division of Responsible Party Site Remediation
CN 028
Trenton, NJ 08625-0028
Tel. # 609-984-3156
Fax. # 609-292-5604

Scott A. Weiner
Commissioner

Karl J. Delaney
Director

UNDERGROUND STORAGE TANK SITE ASSESSMENT SUMMARY

Under the provisions of the Underground Storage of Hazardous Substances Act in accordance with N.J.A.C. 7:14B

This Summary form shall be used by all owners and operators of Underground Storage Tank Systems (USTS) who have either reported a release and are subject to the site assessment requirements of N.J.A.C. 7:14B-8.2 or who have closed USTS pursuant to N.J.A.C. 7:14B-9.1 et seq. and are subject to the site assessment requirements of N.J.A.C. 7:14B-9.2 and 9.3.

INSTRUCTIONS:

- *Please print legibly or type.*
- *Fill in all applicable blanks. This form will require various attachments in order to complete the Summary. The technical guidance document, Interim Closure Requirements for UST's, explains the regulatory (and technical) requirements for closure and the Scope of Work, Investigation and Corrective Action Requirements for Discharges from Underground Storage Tanks and Piping Systems explains the regulatory (and technical) requirements for corrective action.*
- *Return one original of the form and all required attachments to the above address.*
- *Attach a scaled site diagram of the subject facility which shows the information specified in Item IV B of this form.*
- *Explain any "No" or "N/A" response on a separate sheet.*

Date of Submission _____

00-90010-73
FACILITY REGISTRATION #

Bldg. 142B

I. FACILITY NAME AND ADDRESS

US Army Fort Monmouth, New Jersey
Directorate of Public Works, Bldg. 167
Fort Monmouth, NJ 07703 County Monmouth
Telephone No. 908-532-1475

OWNER'S NAME AND ADDRESS, if different from above

Telephone No. _____

II. DISCHARGE REPORTING REQUIREMENTS

A. Was contamination found? X Yes ___ No If Yes, Case No. 94-7-21-1561-45
(Note: All discharges must be reported to the Environmental Action Hotline (609) 292-7172)

B. The substance(s) discharged was(were) #2 fuel oil

C. Have any vapor hazards been mitigated? ___Yes ___No X N/A

III. DECOMMISSIONING OF TANK SYSTEMS Closure Approval No. N/A Emergency Removal

The site assessment requirements associated with tank decommissioning are explained in the Technical Guidance Document, Interim Closure Requirements for UST's, Section V. A-D. Attach complete documentation of the methods used and the results obtained for each of the steps of tank decommissioning used. Please include a site map which shows the locations of all samples and borings, the location of all tanks and piping runs at the facility at the beginning of the tank closure operation and annotated to differentiate the status of all tanks and piping (e.g., removed, abandoned, temporarily closed, etc.). The same site map can be used to document other parts of the site assessment requirements, if it is properly and legibly annotated.

IV. SITE ASSESSMENT REQUIREMENTS

A. Excavated Soil

Any evidence of contamination in excavated soil will require that the soil be classified as either Hazardous Waste or Non-Hazardous Waste. Please include all required documentation of compliance with the requirements for handling contaminated excavated soil (if any was present) as explained in the technical guidance documents for closure and corrective action. Describe amount of soil removed, its classification, and disposal location.

B. Scaled Site Diagrams

1. Scaled site diagrams must be attached which include the following information:

a. North arrow and scale
b. The locations of the ground water monitoring wells
c. Location and depth of each soil sample and boring
d. All major surface and sub-surface structures and utilities
e. Approximate property boundaries
f. All existing or closed underground storage tank systems, including appurtenant piping
g. A cross-sectional view indicating depth of tank, stratigraphy and location of water table
h. Locations of surface water bodies

C. Soil samples and borings (check appropriate answer)

1. Were soil samples taken from the excavation as prescribed? X Yes ___No ___N/A

2. Were soil borings taken at the tank system closure site as prescribed? ___Yes ___No X

3. Attach the analytical results in tabular form and include the following information about each sample
a. Customer sample number (keyed to the site map)
b. The depth of the soil sample
c. Soil boring logs
d. Method detection limit of the method used
e. QA/QC Information as required

D. Ground Water Monitoring

1. Number of ground water monitoring wells installed 0

2. Attach the analytical results of the ground water samples in tabular form. Include the following information for each sample from each well:

a. Site diagram number for each well installed
b. Depth of ground water surface
c. Depth of screened interval
d. Method detection limit of the method used
e. Well logs
f. Well permit numbers
g. QA/QC Information as required

V. SOIL CONTAMINATION

A. Was soil contamination found? ___ Yes X No
If "Yes", please answer Question B-E
If "No", please answer Question B

B. The highest soil contamination still remaining in the ground has been determined to be:
1. N/A ppb total BTEX, N/A ppb total non-targeted VOC
2. N/A ppb total B/N, N/A ppb total non-targeted B/N
3. ND ppm TPHC
4. N/A ppb _____ (for non-petroleum substance)

C. Remediation of free product contaminated soils

1. All free product contaminated soil on the property boundaries and above the water table are believed to have been removed from the subsurface X Yes ___ No As pertains to this site
2. Free product contaminated soils are suspected to exist below the water table ___ Yes X No
3. Free product contaminated soils are suspected to exist off the property boundaries. ___ Yes X No

D. Was the vertical and horizontal extent of contamination determined? ___ Yes ___ No X N/A

E. Does soil contamination intersect ground water? ___ Yes ___ No X N/A

VI. GROUND WATER CONTAMINATION N/A

A. Was ground water contamination found? ___ Yes ___ No
If "Yes", please answer Questions B-G.
If "No", please answer only Question B.

B. The highest ground water contamination at any 1 sampling location and at any 1 sampling event to date has been determined to be:

1. _____ ppb total BTEX, _____ ppb total non-targeted VOC
2. _____ ppb total B/N, _____ ppb total non-targeted B/N
3. _____ ppb total MTBE, _____ ppb total TBA
4. _____ ppb _____ (for non-petroleum substance)
5. greatest thickness of separate phase product found _____
6. separate phase product has been delineated ___ Yes ___ No ___ N/A

C. Result(s) of well search

1. A well search (including a review of manual well records) indicates that private, municipal or commercial wells do exist within the distances specified in the Scope of Work. ___ Yes ___ No ___ N/A

2. The number of these wells identified is _____.

D. Proximity of wells and contaminant plume

1. The shallowest depth of any well noted in the well search which may be in the horizontal or vertical potential path(s) of the contaminant plume(s) is _____feet below grade (consideration has been given for the effects of pumping, subsurface structures, etc. on the direction(s) of contaminant migration). This well is _____feet from the source and its screening begins at a depth of _____feet.

2. The shallowest depth to the top of the well screen for any well in the potential path of the plume(s) (as described in D1 above) is _____feet below grade. This well is located _____feet from the source.

3. The closest horizontal distance of a private, commercial or municipal well in the potential path of the plume (as determined in D1) is _____feet from the source. This well is _____feet deep and screening begins at a depth of _____feet.

E. A plan for separate phase product recovery has been included. ___Yes ___No ___N/A

F. A ground water contour map has been submitted which includes the ground water elevations for each well. ___Yes ___No ___N/A

G. Delineation of contamination

1. The ground water contaminants have been delineated to MCLs or lower values at the property boundaries. ___Yes ___No

2. The plume is suspected to continue off the property at concentrations greater than MCLs. ___Yes ___No

3. Off property access (circle one): is being sought has been approved has been denied

VII. SITE ASSESSMENT CERTIFICATION [preparer of site assessment plan - N.J.A.C. 7:14B-8.3(b) &9.5(a)3]

The person signing this certification as the "Qualified Ground Water Consultant" (as defined in N.J.A.C.7:14B-1.6) responsible for the design and implementation of the site assessment plan as specified in N.J.A.C. 7:14B-8.3(a) & 9.2(b)2, must supply the name of the certifying organization and certification number.

"I certify under penalty of law that the information provided in this document is true, accurate, and complete and was obtained by procedures in compliance with N.J.A.C. 7:14B-8 and 9. I am aware that there are significant penalties for submitting false, inaccurate, or incomplete information, including fines and/or imprisonment."

NAME (Print or Type) Dinkerrai M. Desai SIGNATURE _____

COMPANY NAME US Army Fort Monmouth DATE _____
(Preparer of Site Assessment Plan)

CERTIFYING ORGANIZATION NJDEP CERTIFICATION NUMBER E0002266

VIII. TANK DECOMMISSIONING CERTIFICATION [person performing tank decommissioning portion of closure plan - N.J.A.C. 7:14B-9.5(a)4]

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

NAME (Print or Type) See Appendix A SIGNATURE _____

COMPANY NAME _____ DATE _____
(Performer of Tank Decommissioning)

IX. CERTIFICATIONS BY THE RESPONSIBLE PARTY(IES) OF THE FACILITY

A. The following certification shall be signed by the highest ranking individual with overall responsibility for that facility [N.J.A.C. 7:14B-2.3(c)1i].

"I certify under penalty of law that the information provided in this document is true, accurate, and complete . I am aware that there are significant penalties for submitting false, inaccurate, or incomplete information, including fines and/or imprisonment."

NAME (Print or Type) James Ott SIGNATURE _____

COMPANY NAME US Army Fort Monmouth DATE _____

B. The following certification shall be signed as follows [according to the requirements of N.J.A.C. 7:14B-2.3(C)2i]:

1. For a corporation, by a principal executive officer of at least the level of vice president.
2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or
3. For a municipality, State, Federal or other public agency by either the principal executive officer or ranking elected official.
4. In cases where the highest ranking corporate partnership, governmental officer or official at the facility as required in A above is the same person as the official required to certify in B, only the certification in A need to be made. In all other cases, the certifications of A and B shall be made.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false, inaccurate, or incomplete information, including fines and/or imprisonment."

NAME (Print or Type) _____ SIGNATURE _____

COMPANY NAME _____ DATE _____

SMITH

APPENDIX B

WASTE MANIFEST

State of New Jersey
Department of Environmental Protection and Energy
Hazardous Waste Regulation Program
Manifest Section
CN 028, Trenton, NJ 08625-0028

Please type or print in block letters. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039. Expires 9-30-94

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. NJ3 2 1 1 6 2 0 5 9 7 — Manifest Document No. 5 3 1 9 7 — 2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address: US Army/communications Electronics command Monmouth Post c/o James Shoghio Bldg 2504 AMSEL-EM-BL-EN-MS Fort Monmouth, NJ 07703

A. State Manifest Document Number: **NJA 1603196**

4. Generator's Phone (908) 532-6223

B. State Generator's ID

5. Transporter 1 Company Name: Freehold Cartage Inc

6. US EPA ID Number: NJD054126082

C. State Trans. ID: NJDEPS 2265 *

D. Transporter's Phone 908 462-1001

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Trans. ID

F. Transporter's Phone

9. Designated Facility Name and Site Address: Lionetti Oil Recovery Co Inc. Runyon & Chesapeake RD Old Bridge NJ 08857

10. US EPA ID Number: NJD084144065

G. State Facility's ID

H. Facility's Phone 908 721-0900

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. Petroleum oil, NOS class 3 (Petroleum oil) combustible liquid UN1270 PG III	X	001	TT	01100	G	X 7 2 2
b. Petroleum oil, NOS class 3 (Petroleum oil) combustible liquid UN1270 PG III	X	001	TT	00732	G	X 7 2 2
c. Petroleum oil, NOS class 3 (Petroleum oil) combustible liquid UN1270 PG III	X	001	TT	01932	G	X 7 2 2
d. Petroleum oil, NOS class 3 (Petroleum oil) combustible liquid UN1270 PG III	X	001	TT	04454	G	X 7 2 2

J. Additional Descriptions for Materials Listed Above

a. oil 60% water 40% L,T
b. oil 60% water 40% L,T
c. oil 60% water 40% L,T
d. oil 60% water 40% L,T

K. Handling Codes for Wastes Listed Above

a. T04 Filtration
b. T04 Filtration
c. T04 Filtration
d. T04 Filtration

15. Special Handling Instructions and Additional Information: Not EPA Regulated - NJ hazardous
24 hr Emergency # 201-429-2881
*DEC # 55404
a) NJDEPE 0090010-7
b) NJDEPE 0090010-13A
c) NJDEPE 0090010-13B
d) NJDEPE 0090010-16

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Joseph M. Fallon — Signature: Joseph M. Fallon — Month Day Year: 07 13 94

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: PAULO R. MEDEIROS — Signature: [signature] — Month Day Year: 07 13 94

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name — Signature — Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name — Signature — Month Day Year

EPA Form 8700-22 (Rev. 9/88) Previous editions are obsolete.

SIGNATURE AND INFORMATION MUST BE LEGIBLE ON ALL COPIES

In case of an emergency or spill immediately call the state the emergency occurred in and the N.J. Dept. of Environmental Protection and Energy (609) 292-7172

CALCULATION SHEET

Building No. 142B NJDEPE Reg. No. 0090010 - 13B

Tank Size 1000 gal Tank Void 7.5 tons

CLEAN FILL

ITEM NO.	DESCRIPTION	QUANTITY	TICKET #
	Fill	22.18	18811
		22.35	18810
		~~22.03~~	18774
		15.03	

TOTAL 59.56

STONE

ITEM NO.	DESCRIPTION	QUANTITY	TICKET #

TOTAL ϕ

ID#27 soil to stockpile (ϕ +59.56) - 7.5 = 52.06 tons

Chargeable clean fill ~~ϕ~~ 52.06

Chargeable stone ϕ

Joseph Scrano Sand & Gravel Co.

1453 W. Park Ave., Wayside
Asbury Park, N.J. 07712
908-493-3333

18811

Order Date July / 13 / 94

Name Big A Trucking

Deliver Date / /

Address

Delivered ☐ C.O.D. ☐

Clark Fill

F.O.B./P.U. ☐ Charge ☑

Item(s)	Quantity / Measure (tons, lbs., yds., ea.)	Unit Price	Total
	G 69910		
	T 25500	22.18 tons	
	N 44360		
		Sub Total	
		Delivery	
		N.J. Tax	
		Total	

Driver

Received

* Company not responsible for damage done off public roads. Color not guaranteed!

Have gravel will travel
since 1925

Joseph Soprano Sand & Gravel Co.

1453 W. Park Ave., Wayside
Asbury Park, N.J. 07712
908-493-3333

296

18810

Order Date July, 13, 94

Name Big A Trucking

Deliver Date ___/___/___

Address Clan Fill

Delivered ☐ C.O.D. ☐

F.O.B./P.U. ☐ Charge ☑

Item(s)	Quantity / Measure (tons, lbs., yds., ea.)	Unit Price	Total
	G 70200 00		
	T 25500		
	N 44700	22.35 tons	
		Sub Total	
		Delivery	
		N.J. Tax	
		Total	

Driver [illegible]

Received [signature]

* Company not responsible for damage done off public roads. Color not guaranteed!

Have gravel will travel!
since 1925

Joseph Scarano Sand & Gravel Co.

1453 W. Park Ave., Wayside
Asbury Park, N.J. 07712
908-493-3333

18774

Name By Tankery
Address
Clean Fill

Order Date __ / __ / __
Deliver Date 7 / 6 / 94
Delivered ☐ C.O.D. ☐
F.O.B./P.U. ☐ Charge ☑

Item(s)	Quantity / Measure (tons, lbs., yds., ea.)	Unit Price	Total
	G - 70,650		
	T 25,590	22.53 tons	
	N		

Driver Unit 5

Received [signature]

Sub Total	
Delivery	
N.J. Tax–	
Total	

* Company not responsible for damage done off public roads. Color not guaranteed!

Have gravel will travel!
since 1925

Bldg 142 A 7.5 tons
Bldg 142 B 15.03 Tons

SMITH

APPENDIX C

UST DISPOSAL CERTIFICATE

Bldg [illegible]
411 – UST-009001028
491 – " 009001071
430 – 009001045
1426 – No UST 2009 00/0-138
Fort Monmouth
Eatontown, NJ

MAZZA & SONS, INC.

Metal Recyclers
Auto and Truck
3230 Shafto Rd.
Tinton Falls, NJ
(908) 922-9292

NO. ____________

DATE 1 Aug 94

Customer's Name Cute inc

Address ____________

Make of Autos

Tires

Tank

Price.

43520 LB G

38390 LB G

PAID
AUG - 1 1994

	Weight	Price
Cast Iron		
Steel		
Lt. Iron		
Copper #1		
Copper #2		
Lt. Copper		
Brass		
Alum Clean		
Lead		
Stainless		
Radiators		
Battery		
TOTAL AMOUNT:		

Weigher ____________ Customer Don Ellis

SMITH

APPENDIX D

SOIL ANALYTICAL DATA PACKAGE

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEPE Certification # 13461

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 167
Ft. Monmouth, NJ 07703

Lab. ID #: 1578.1-.7
Sample Rec'd: 07/21/94
Analysis Start: 07/22/94
Analysis Comp: 07/22/94

Analysis: 418.1 (TPH)
Matrix: Soil
Analyst: S. Hubbard
Ext. Meth: Sonc.

NJDEPE UST Reg.#:
Closure #:
DICAR #:
Location #: **Bldg. 142B**

Lab ID.	Description	%Solid	Result (mg/Kg)	MDL
1578.1	Site A, N.W. Corner OVA= 61	83	ND	6.6
1578.2	Site B, N.E. Corner OVA= 2	84	ND	6.6
1578.3	Site C, East OVA= 1	79	ND	6.6
1578.4	Site D, South East OVA= 8	88	ND	6.6
1578.5	Site E, South West OVA= 2	82	ND	6.6
1578.6	Site F, West OVA= 2	84	ND	6.6
1578.7	Site G, N.W. Dup OVA= 50	81	ND	6.6
M. Bl.	Method Blank	100	ND	3.3

Notes: ND = Not Detected, MDL = Method Detection Limit
* = Silica Gel Added, NA = Not Applicable
1578.7 dup= 100% 1578.7 s= 114% 1578.7 sd= 107% RPD= 6.3%

Brian K. McKee
Laboratory Director

SERV-AIR, INC.

P.O. #:

Chain of Custody

Project #: Closure	Sampler: Cute	Date / Time 7/21/94 1430	Analysis Parameters
Customer: D. Desai	Site Name: BCAS 142B		Start: / Finish:
Phone:			Preservation Method

Lab Sample ID Number	Date/Time	Customer Sample Location/ID Number	Sample Matrix	# of Bottles	TPHC	9a Solid	MS/MSD	OVA	Remarks
A 1578.1	7/21 1-30	A NW Corner	Soil	1				81	
B .2	1-20	B NE "		1				2	
C .3	1-30	C East		1				1	
D .4	1-40	D SOUTHEAST		1				8	
E .5	1-50	E Southwest		1				2	
F .6	1-59	F West		1				2	OVA SN A32114
G .7	2-04	G NW - (DUP)		1				50	Cal 7-21-94 13:10 @ Air + 95 ppm CH4 @ 3.0 Read 66 - High Humidity

Relinquished By (signature)	Date / Time	Received By (signature)	Shipped By:

Relinquished By (signature)	Date / Time	Received for Lab by (signature):	Date / Time
	7/21 2-40		7/21/94 1440

Note: A drawing depicting sample location should be attached or drawn on the reverse side of this chain of custody.

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEPE Certification # 13461

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 167
Ft. Monmouth, NJ 07703

Lab. ID #: 1578.1-.7
Sample Rec'd: 07/21/94
Analysis Start: 07/22/94
Analysis Comp: 07/22/94

Analysis: Munsel

Lab ID#	Soil Color
1578.1	2.5Y 4/4 Olive Brown
1578.2	10YR 4/6 Dark Yellowish Brown
1578.3	2.5Y 4/4 Olive Brown
1578.4	2.5Y 4/4 Olive Brown
1578.5	2.5Y 5/6 Light Olive Brown
1578.6	2.5Y 5/6 Light Olive Brown
1578.7	2.5Y 4/4 Olive Brown

Brian K. McKee
Laboratory Director

July 22, 1994 0848 Sarah J. Hubbard

Blank

40.75 105 MV

81.5 204 MV

165 408 MV

1578.1 1 MV

1578.2 0 MV

1578.3 0 MV

1578.4 0 MV

1578.5 0 MV

1578.6 0 MV

1578.7 1 MV

1578.7 1 MV Duplicate

1578.7 36 MV Spike

1578.7 34 MV Duplicate Spike

1579.1 1 MV

1579.2 0 MV

1579.3 2 MV

1579.4 0 MV

1579.5 0 MV

1579.6 4 MV

1579.7 0 MV

PHC Conformance/Non-conformance Summary Report

	No	Yes
1. Blank Contamination - If yes, list the sample and the corresponding concentrations in each blank	✓	
2. Matrix Spike/Matrix Sp Dup. Recoveries Meet Criteria (If not met, list the sample and corresponding recovery which falls outside the acceptable range)		✓
3. IR Spectra submitted for standards, blanks, & samples		✓
4. Chromatograms submitted for standards, blanks, and samples if GC fingerprinting was conducted.		N/A
5. Extraction holding time met. (If not met, list number of days exceeded for each sample)		✓
6. Analysis holding time met. (If not met,list number of days exceeded for each sample)		✓

Comments: _____

Laboratory Authentication Statement

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

Project #1578

Brian K. McKee
Laboratory Manager

Attachment B
Field Notes

Location FTMM Date 11-10-17

Project / Client USACE

1000 CONTINUE ADDING SAND, AUGUR BUCKETS AND CONTAINERIZING CUTTINGS TO LABELED DRUM. PID READING OF 0.9ppm IN DRUM.

1020 #1 MORIE SAND TO 1.5' BGS AND #0 SAND TO 1' BGS AND SEAL TO .5' BGS.

1030 PREPARE PAD AND INSTALL STICK UP PROTECTIVE CASING.

1100 CREW CLEANS AREA, LOADS DRUM

1110 I STAY WITH THE GEOPROBE AS CREW TRANSFERS THE DRUM TO THE STAGING AREA.

1130 CREW RETURNS, LOADS RIG TO TRAILER, HEAD TO PAR 79 MW-01 LOCATION, THE CREW REQUESTS TO TAKE LUNCH NOW.

1200 RETURN TO PAR 79 MW-01 SET UP RIG. NOTE THAT LOCATION IS UNABLE COMMUNICATION LINES. CREW IS CAREFUL TO NOT EXCEED MAXIMUM DISTANCE REQUIREMENTS. BASED UPON NEARBY WELL LOG, THE CREW IS INSTRUCTED TO AUGER TO 12.5' AND SET A 10'-LONG SCREEN TO 12'.

1220 CREW PULLS AUGERS WHILE ADDING SAND.

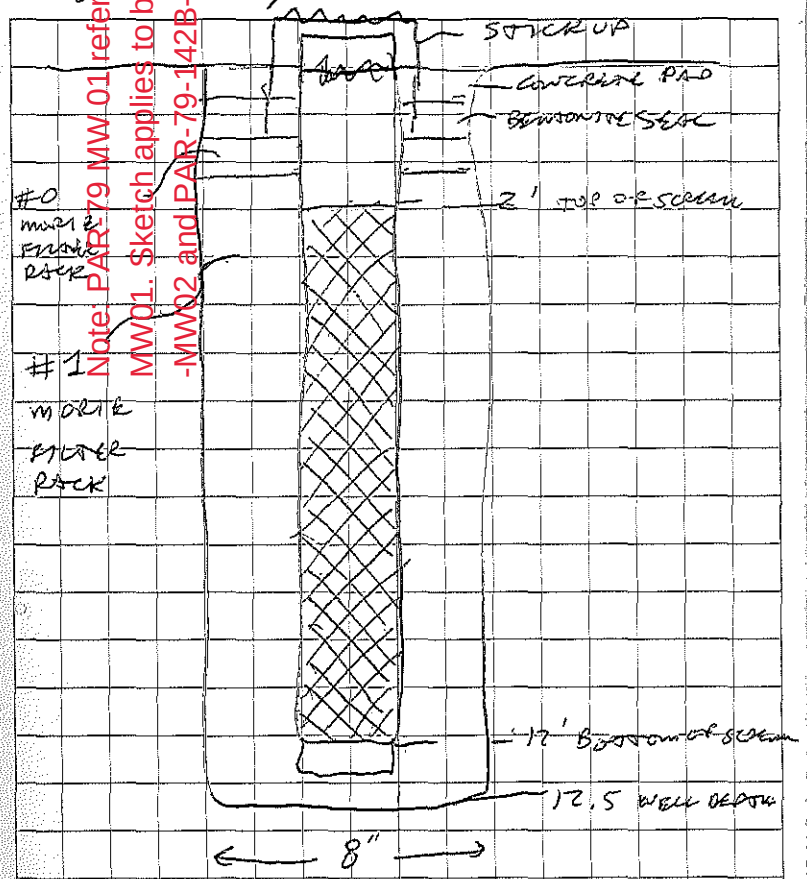
1230 PREPARE PAD AREA.

11-10-17

Location FTMM Date 11-10-17

Project / Client USACE

UST 2020 / PAR 79-MW-01 SKETCH



11-10-17

Note: PAR 79 MW-01 refers to well PAR-MW01. Sketch applies to both well PAR-MW01 and PAR-79-142B-MW01

Location FTMM Date 11-10-17

Project / Client USACE

RAP-79-MW-01

1245 CREW TRANSFERS DRUM OF CUTTINGS FROM RAP 79 - MW-01 LOCATION TO PLACE AT STAGING AREA

1330 CREW RETURNS TO COMPLETE THE RAD

1350 HEAD TO RAP 105 LOCATIONS FOR SOIL BORING SAMPLING. COLLECT FB AT 1405

1410 PUSH AT 105-SB-01 0-5

1420 PUSH AT 105-SB-02 0-5

1430 PUSH AT 105-SB-03 0-5

1425 COLLECT SAMPLES AND COMPLETE BORING LOGS FOR ABOVE THREE BORINGS.

1450 CREW LOADS EQUIPMENT AND DEBRIS FOR THE DAY.

1510 HEAD TO THE OFFICE TO PREPARE COCs AND FIELD NOTE SCANS.

1630 TERMINATE PINE RENTAL FOR ONE PID AND ONE WATER LEVEL METER. THE PINE CONFIRMATION # IS KCG15726. THEY ARE SCHEDULED TO PICK-UP THE EQUIPMENT 11/13/17.

1700 SIGN COC FORMS, REFRIDGERATE SAMPLES.

1750 OFF SITE

12-10-17

Location Date

Project / Client

Attachment C
Boring Logs

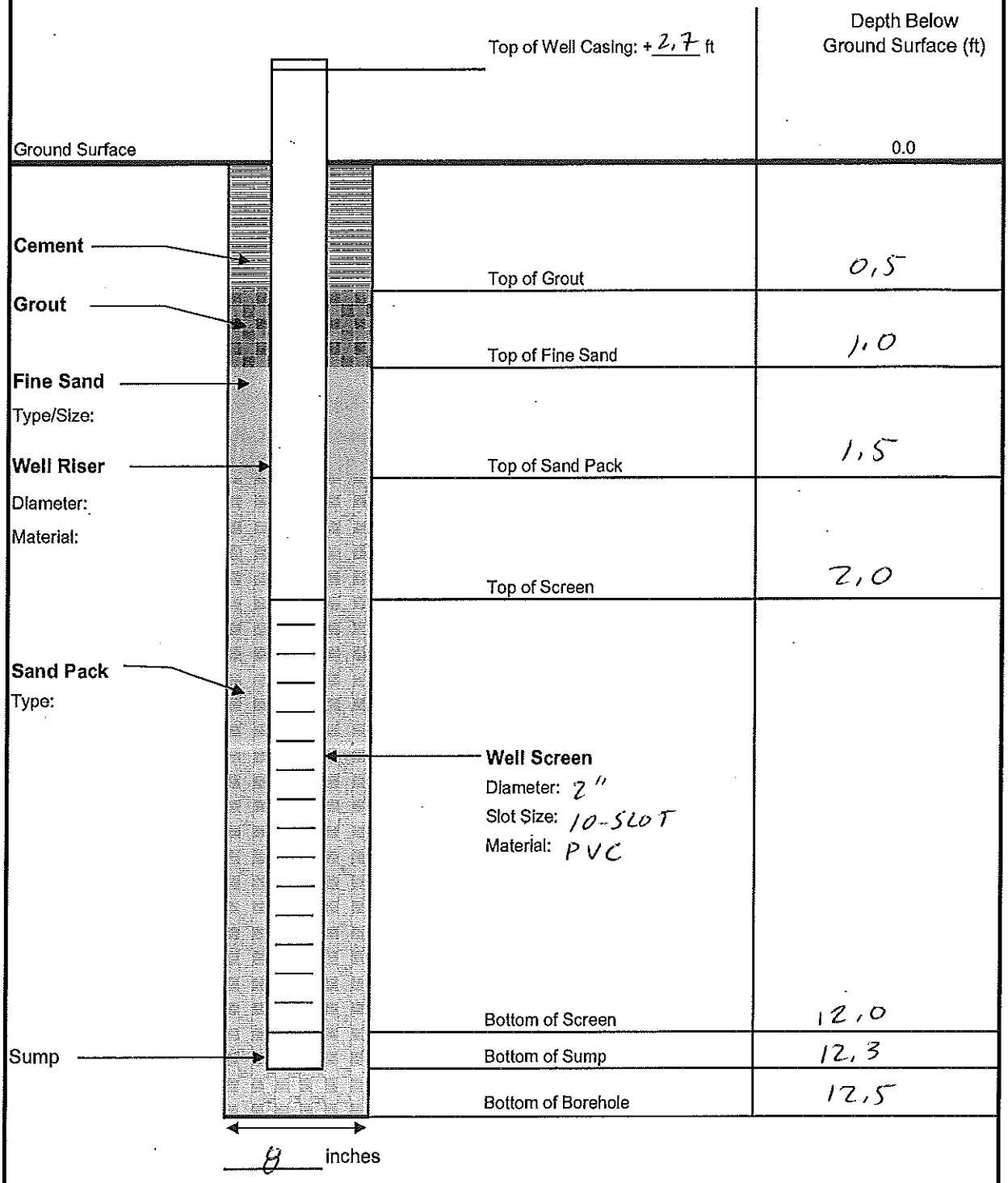
PARSONS

Well Construction Detail (Single Cased - Stickup)

Client: USACE

Well ID: PAR79-142B-mw-01 NJBWA Permit No.

Date Well Installed: 11-10-17 Location: PAR 79-142B



Top of Confining Unit (if present): _____

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM Parcel 79
PROJECT NUMBER: 748610-

GROUNDWATER OBSERVATIONS
WATER LEVEL: —
DATE: —
TIME: —
MEAS. FROM:

INSPECTOR: TOM HORN
DRILLER: ECDI
WEATHER: CLOUDY, 40°F, WINDY
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) ~~7822DT~~ 6610DT
DATE/TIME START: 11-10-17 / 1200
DATE/TIME FINISH: 11-10-17 / 1230
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR79-142B-MW-01
LOCATION DESCRIPTION: GRASSY AREA
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0					AUGERED TO 12.5' WET LOOSE GREY-BROWN-TAN CUTTINGS TRANSFERRED TO A DRUM PID READINGS OBSERVED DURING THE INSTALLATION WERE 0.0 ppm.		
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Remarks:

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

Consistency vs. Blowcount / Foot

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

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM Parcel
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ~4
DATE: 8/4/16
TIME: 1350
MEAS. FROM:

INSPECTOR: C. WATSON
DRILLER: J. BARNAK
WEATHER: 80°F Clear
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 1320
DATE/TIME FINISH: 1340
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-79-142-TMW09
LOCATION DESCRIPTION: Parcel 79-142
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/48	0	0-12" light Brown, Dry, mf SAND, trace silt		
1					12"-22" moist, dark grey, mf SAND and f gravel, trace silt		
2					22"-48" Moist, orange/Brown/grey mottled mf SAND, trace silt trace f gravel, saturated @ 48"		
3							
4							
5			60/36	0	0-30" SAA, saturated, 1 piece of cobble @ top		
6					30-36" Wet, Black, f SAND, little silt, mica present		
7							
8							
9							
10							

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