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

September 29, 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: Letter Work Plan Addendum for Phase 2 Remedial Investigation at FTMM-68, Former Dry Cleaners at Building 700, Fort Monmouth, New Jersey
PI G000000032

Dear Ms. Range,

The purpose of this Letter Work Plan Addendum is to augment the completed Phase 1 Remedial Investigation (RI) at Fort Monmouth (FTMM) Site FTMM-68 (former dry cleaners at Building 700), located within the Main Post of FTMM. Additional investigation of soil and groundwater quality will be performed to better delineate the magnitude and lateral/vertical extent of chlorinated volatile organic compounds (CVOCs) in soil and groundwater. This Phase 2 investigation will be performed to supplement the initial Phase 1 investigation of soil and groundwater performed at FTMM-68 from September to November 2015 in accordance with the *Remedial Investigation/Feasibility Study Work Plan for Sites FTMM-22, FTMM-53, FTMM-59, and FTMM-68* (Parsons, 2015); this Work Plan was approved by the New Jersey Department of Environmental Protection (NJDEP) in the April 27, 2015 letter. Applicable portions of the existing Health and Safety Plan and Sampling and Analysis Plan/Quality Assurance Project Plan for FTMM, included herein by reference, will be used during the Phase 2 investigation.

1.0 Summary of Phase 1 RI Results and Conceptual Site Model

Work performed at this site under the RI/Feasibility Study (RI/FS) Work Plan (Parsons, 2015) included advancement of direct push soil borings and collection of soil and groundwater grab samples, and installation/sampling of permanent monitoring wells. Three soil borings were advanced to depths of 25-30 feet below ground surface (bgs) and one soil boring was advanced to 5.5 feet bgs adjacent to the former solvent underground storage tank (UST) at the southwest corner of Building 700 in the Fall of 2015 (**Figure 1**). Nine primary soil samples (three per boring) were collected from the three deeper borings at depths ranging from 1.5 to 24.5 feet bgs; the samples were analyzed for volatile organic compounds (VOCs) at a fixed-base laboratory. Concentrations of PCE in the soil samples ranged up to 360,000 micrograms per kilogram (µg/kg) in the sample collected from soil boring FTMM-68-SB3 at 12.5-13 feet bgs.

The Phase 1 soil sampling indicated that solvents have migrated vertically to the water table (approximately 6 feet bgs) through Coastal Plain sediments consisting of sand with mixtures of silt and clay, and discontinuous clay and silt/clay layers. The solvents have migrated below the water table to a depth of more than 24 feet bgs. However, the lateral and vertical extents of PCE concentrations exceeding NJDEP direct contact soil remediation standards were not delineated during the Phase 1 investigation. The detection of elevated PCE concentrations in source area soil is consistent with historical groundwater sampling results for source area monitoring well pair 565MW01 and 565MW01D, installed adjacent to the former solvent UST by the Army in August 2011. PCE concentrations in groundwater from 565MW01 (screened 5 to 15 feet bgs) and 565MW01D (screened 18 to 23 feet bgs) have ranged up to 1,300 µg/L and 4,800 µg/L, respectively.

A total of 13 groundwater grab samples were collected at nine locations east and southeast of the former solvent UST (in directions thought to be potentially hydraulically downgradient of the former tank) by installing temporary monitoring wells with 5-foot-long screens in direct push borings (**Figure 1**). The samples were collected at depths ranging from 15 to 35 feet bgs and were analyzed for VOCs at a fixed-base laboratory. Based on the grab sampling results, four permanent shallow monitoring wells were installed to a depth of 25 feet bgs and one permanent deep monitoring well was installed to 40 feet bgs; all five wells have 10-foot-long screens. The permanent wells, including the previously installed well pair located in the source area, were sampled in November 2015. Based on the analytical results for groundwater grab and permanent well samples, a CVOC plume (consisting primarily of PCE) in groundwater has been preliminarily defined (**Figure 1**). The plume of dissolved-phase CVOCs has developed to depths of greater than 23 feet bgs in the source area and 40 feet bgs downgradient of the source area. The PCE has migrated an estimated 550 feet from the former solvent UST in an easterly direction toward Husky Brook; this migration direction is consistent with the groundwater flow direction indicated by site-specific potentiometric surface maps. However, the plume is partially defined using groundwater grab sample data that are not considered to be definitive, and the vertical extent of the plume was not defined. The maximum PCE concentration detected in downgradient groundwater is 690 µg/L at deep well FTMM-68-MW-01 (screened 30 to 40 feet bgs), located approximately 240 feet east of the former solvent UST (**Figure 1**). Geologic cross-section A-A' (**Figure 2**) shows the lithologies encountered during the Phase 1 investigation in the Fall of 2015.

2.0 Proposed Phase 2 Investigation

The objectives of the Phase 2 work are to more accurately determine 1) the lateral and vertical extent of the CVOC plume in groundwater, 2) the lateral and vertical extent of CVOCs in soil in the source area, 3) the hydraulic conductivity of the saturated zone along the plume migration pathway, and 4) concentrations of key biogeochemical indicator parameters in groundwater.

Proposed drilling and sampling locations for the Phase 2 RI are summarized in **Table 1**. Additional sampling details for soil and groundwater are provided in **Table 2**. Boring locations will be assigned location IDs consistent with other FTMM boring locations during the field program.

2.1 MIP/HPT Borings

A direct-push technology drill rig (Geoprobe®) equipped with a combination of regular and low-level Membrane Interface Probes (MIPs) will be used to obtain near real-time, semi-quantitative, detailed subsurface profiles of contaminant concentrations to an estimated maximum depth of 75 feet bgs at a maximum of 13 locations (**Table 1**). These 13 locations include locations 1, 2a, 2b, 2c, 2d, and 3 through 10 shown on **Figure 1**. These borings will extend deeper into and to the approximate base of the Tinton Formation. The objective of the MIP investigation is to rapidly delineate the lateral and vertical extents of CVOCs in soil and groundwater. A MIP is a semi-quantitative, field-screening device that can detect VOCs in subsurface media. A regular MIP will be used within the PCE plume footprint, and a low-level MIP that has lower detection limits will be used in adjacent locations estimated to be minimally contaminated or uncontaminated to determine the lateral plume extent. Continuous measurements will be obtained using the regular MIP, and low-level MIP measurements will be obtained at a frequency of not less than every 2 feet.

A Hydraulic Profiling Tool (HPT) will be used concurrently with the MIP at up to 10 of the 13 locations to obtain both VOC and hydraulic profile information (**Table 1**). These locations include locations 1, 2a, 3, 4, 5, 6, 7, 8, 9, and 10 (**Figure 1**). The objective of the HPT investigation is to delineate relatively permeable zones that may represent preferred groundwater and contaminant migration pathways, as well as less permeable zones that may represent aquitards and act as "sorption sinks" for VOCs that can perpetuate the groundwater plume via the process of matrix diffusion. The HPT is advanced into unconsolidated soils concurrently with the MIP to assess formation permeability and hydrostratigraphy at the centimeter scale. During advancement, water is injected at a controlled rate into the formation through a screened port on the side of the HPT probe. A transducer in the probe measures the total pressure required to inject the water into the formation while a flow controller at the surface monitors the injection flow rate. These data can be used to estimate hydraulic conductivity in the formation at small scale.

The MIP/HPT subcontractor will provide MIP/HPT results to Parsons on a daily basis for analysis and interpretation; the results will be used by Parsons to adjust investigation locations and depths as needed to meet RI objectives. Following the completion of the MIP/HPT survey, two- and/or three-dimensional visualizations of the MIP/HPT results will be generated by the subcontractor to depict subsurface conditions and support location of new permanent monitoring wells.

Following completion, all MIP/HPT borings will be grouted to the surface using NJDEP-approved methods.

2.2 Direct Push Confirmation Borings

Following completion of the MIP/HPT investigation, a maximum of 13 confirmatory soil borings will be advanced to an estimated maximum depth of 75 feet adjacent to the 13 MIP borings (refer to **Table 1**). The confirmatory borings will be advanced using a Geoprobe® to obtain more quantitative contaminant concentration data, confirm the lateral and vertical extent of subsurface

contamination indicated by the MIP results, and facilitate optimal location of permanent groundwater monitoring wells. Soil quality samples for laboratory analysis of VOCs and reactive iron sulfide minerals, and groundwater grab samples for field analysis of CVOCs, will be collected at selected locations and depths based on the MIP/HPT data.

An estimated maximum of 26 primary soil samples plus associated field QC samples and 25 primary groundwater grab samples will be collected from the Geoprobe® confirmation borings for VOC/CVOC analysis as detailed in **Table 2**. The Geoprobe® soil and groundwater samples will be collected using a Macro-core sampler and a Screenpoint 16 groundwater sampler, respectively. Up to three samples will be collected for mineralogical analysis to assess the potential for *in situ* abiotic degradation of CVOCs via contact with naturally occurring reactive iron sulfide minerals (**Table 2**). These mineralogical analyses will include bioavailable iron, magnetic susceptibility, acid volatile and chromium reducible sulfide, total and ferrous iron, and total sulfur. In addition, up to six soil cores collected in the source area near the former solvent UST will be evaluated for the presence of dense non-aqueous phase liquid (DNAPL) using a fabric impregnated with a NAPL-sensitive dye (i.e., NAPL FLUTe reactive material). Groundwater grab samples will be analyzed in the field for CVOCs using an AQR ColorTec field test kit (estimated detection limit of 3 to 5 µg/L); an estimated maximum of five of the 25 groundwater grab samples representing low, medium, and high concentration intervals based on MIP results will also be analyzed at a fixed-base laboratory on a rapid turnaround basis to provide comparative data. Following completion, the Geoprobe® confirmation borings will be grouted to the surface using NJDEP-approved methods.

2.3 Installation and Sampling of Permanent Monitoring Wells

The information collected from MIP/HPT and Geoprobe® confirmation borings will be used to confirm the locations and depths of up to 10 permanent groundwater monitoring wells (excluding two optional locations) that will be installed using the sonic drilling method (**Table 1**). It is anticipated that three of the wells will be installed to an estimated maximum depth of 80 feet bgs to confirm the vertical extent of CVOCs in groundwater; these wells will be double-cased to prevent cross contamination from shallower depths during drilling and well installation. We anticipate installing double-cased wells at locations 2a, 4, and 6 (**Figure 1**); however, this will be subject to MIP and Geoprobe® confirmation sampling results. The remainder of the monitoring wells will be installed to estimated depths of 20 to 50 feet bgs and will be single cased; we anticipate that these wells will be installed at or near locations 1, 3, 5, 7, 8, 9, and 10 (**Figure 1**). The MIP/HPT and Geoprobe® confirmation boring data will be used to determine the proper depth of the isolation casing at each location. A temporary isolation casing will be used for deep wells installed in lower-concentration areas outside of the source area, and a permanent, grouted-in isolation casing (outer component of the double-cased well) will be used in the high-concentration source area (i.e., location 2a).

Continuous soil samples for geologic description will be collected during sonic drilling at each new permanent well location. During this soil core sampling, a total of up to 10 soil samples will be collected for analysis of total organic carbon to facilitate calculation of retardation coefficients

(**Table 2**). Wells will be 2-inch diameter, schedule 40 polyvinyl chloride, constructed with 10 feet of screen with 0.01-inch slots. New monitoring wells will be developed by a combination of pumping and surging in accordance with the NJDEP Field Sampling Procedures Manual (2005).

Up to 19 (nine existing and up to 10 new) monitoring wells will be sampled for VOCs using low-flow purge and sample methodology to facilitate evaluation of remedial alternatives during the feasibility study (**Table 2**). New wells will be vertically profiled. The wells will be sampled a minimum of two weeks after installation/development. Samples from up to 10 of the 19 wells will also be analyzed for the following biogeochemical natural attenuation indicator parameters: nitrate, ferrous iron, sulfate, sulfide, chloride, dissolved gases (methane/ethane/ethene/carbon dioxide), alkalinity, and dissolved organic carbon (**Table 2**). An estimated maximum of six wells will also be sampled for microbial census analysis to determine the presence and abundance of CVOC-degrading microorganisms.

While this plan describes specific proposed locations and methods (e.g., MIP/HTP, Geoprobe® drilling and well installation), the plan is intended to be dynamic and it may be revised as the field work progresses and new information is obtained. If significant adjustments are needed that vary widely from what is proposed in this work plan, Parsons will notify the NJDEP project manager.

We look forward to your review of this proposed Phase 2 RI plan, and approval or additional comments. The technical Point of Contact (POC) for this matter is Cris Grill at (617) 449-1583 or by email at cris.grill@parsons.com. Should you have any questions or require additional information, please contact me by phone at (732) 380-7064 or by email at william.r.colvin18.civ@mail.mil.

Sincerely,

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

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

References Cited:

Parsons. 2015. Final Remedial Investigation/Feasibility Study Work Plan for Sites FTMM-22, FTMM-53, FTMM-59, and FTMM-68, Fort Monmouth, Oceanport, Monmouth County, New Jersey. March.

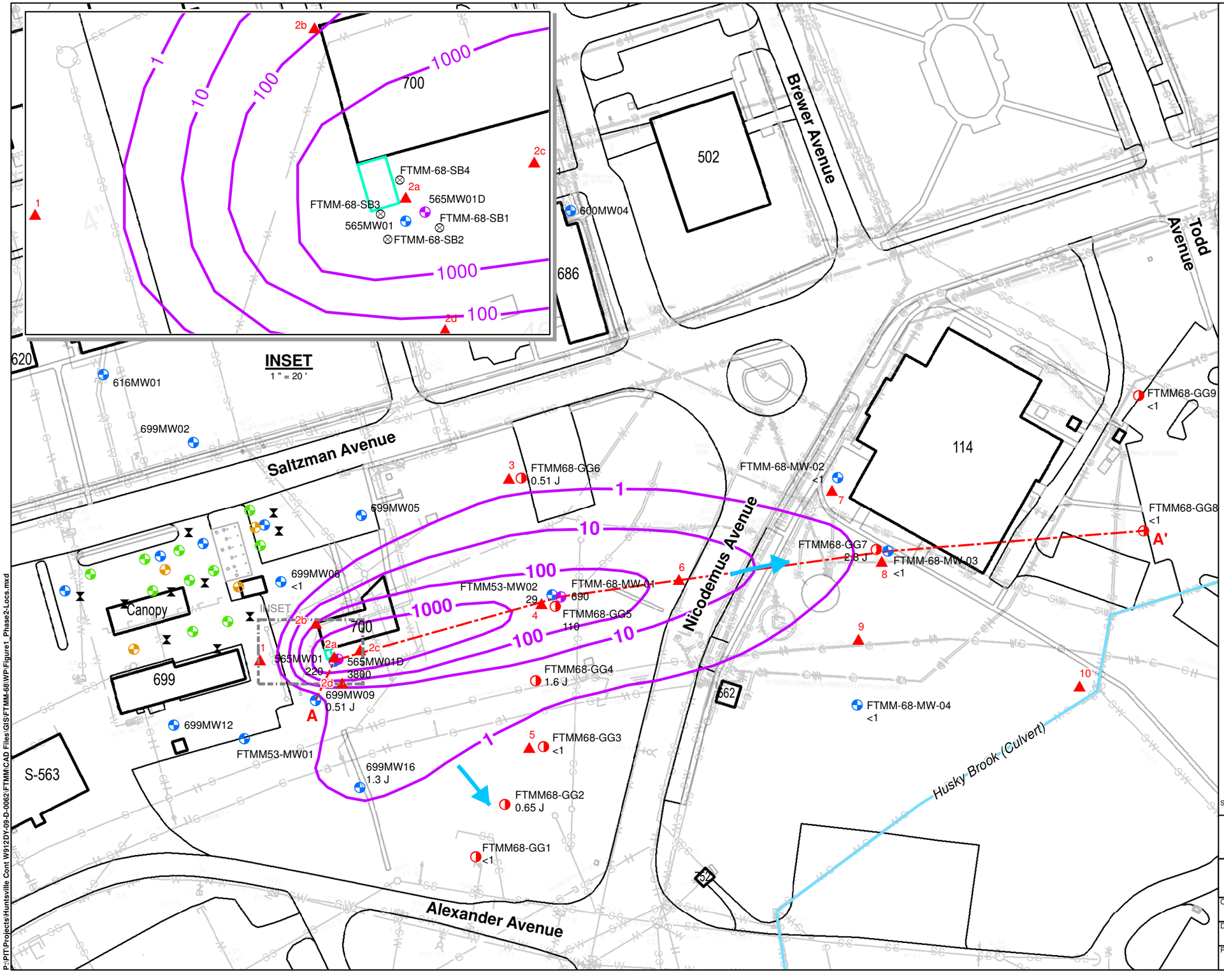
Stanford, S. and P. Sugarman. 2010. Bedrock Geology of the Long Branch Quadrangle. Monmouth County, New Jersey. Open File Map OFM-78. New Jersey Geological Survey.

Attachments:

Figure 1: Proposed Phase 2 Investigation Locations and Location of Cross-Section A-A'
Figure 2: Geologic Cross-Section A-A'

Table 1: Drilling and Sampling Summary for FTMM-68 Letter Work Plan Addendum
Table 2: Sampling Locations and Rationale for FTMM-68 Letter Work Plan Addendum

Figure 1
Proposed Phase 2 Investigation Locations and Location of Cross-Section A-A'



LEGEND:

- Proposed Phase 2 Investigation Location
- Phase 1 Soil Boring
- Phase 1 Groundwater Grab Sample
- Shallow Monitoring Well
- Deep Monitoring Well
- Vapor Monitoring Well
- Recovery Well
- Air Sparge Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- UST Excavation Footprint
- PCE Concentration Contour
- Inferred Groundwater Flow Direction
- Cross-Section Line (See Figure 2)

NOTES:

1. All results are in micrograms per liter (µg/L).
2. PCE Concentrations in monitoring wells are for November 2015.
3. PCE Concentrations in groundwater grab samples are for September 2015

N

1 inch = 100 feet

0 50 100 200 Feet

Source: FTMM Supplied CAD

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
PCE PLUME, PROPOSED PHASE 2 INVESTIGATION LOCATIONS & LOCATION OF CROSS-SECTION A-A'	
CREATED BY: RR	REVIEWED BY: JH
DATE: SEP. 2016	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-02180	FILE: Figure1_Phase2-Locs.mxd

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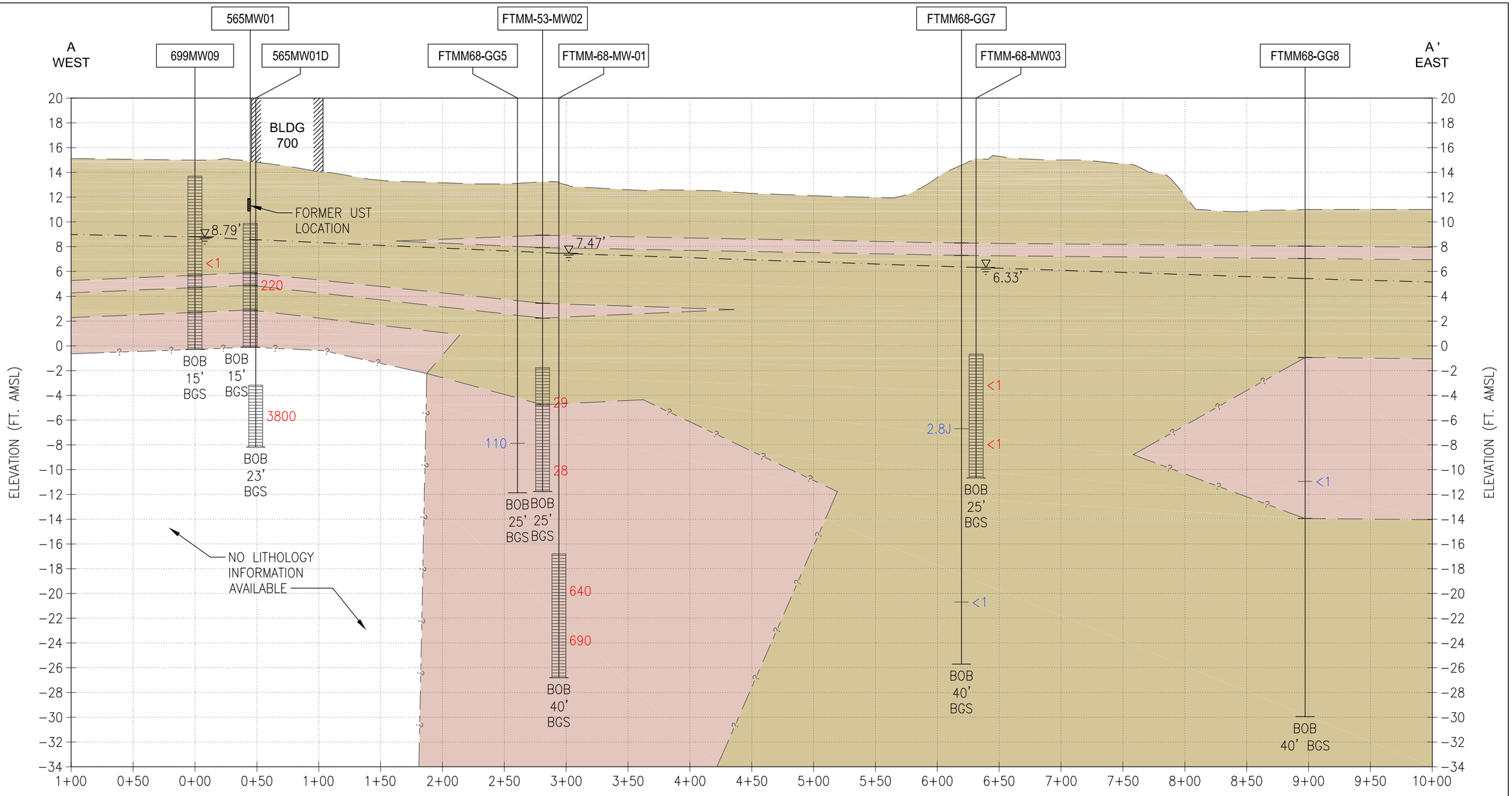
Figure 2
Geologic Cross-Section A-A’



LEGEND:

- CLAY WITH TRACE TO SOME SAND, SILT, CLAY, CLAYEY SILT, SILT/CLAY MIXTURES. OCCASIONALLY GLAUCONITIC
- SAND, SAND WITH TRACE TO SOME SILT AND/OR CLAY, SILTY SAND, SAND OR SAND/SILT MIXTURES WITH TRACE TO SOME GRAVEL, OCCASIONALLY GLAUCONITIC
- WELL SCREEN
- WATER TABLE
- <1 PCE WELL CONCENTRATION, NOVEMBER 2015
- <1 PCE GRAB SAMPLE CONCENTRATION, SEPTEMBER 2015

NOTES:

FT = FEET
FT ASML = FT ABOVE MEAN SEA LEVEL
BOB = BOTTOM OF BORING
BGS = BELOW GROUND SURFACE
ALL RESULTS ARE IN MICROGRAMS PER LITER (µg/L)

HORIZONTAL SCALE: 1" = 80'

80H 40H 0 80H 160H

8V 4V 0 8V 16V

VERTICAL SCALE: 1" = 8'

Source: FTMM Supplied CAD

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
GEOLOGIC CROSS-SECTION A-A'	
CREATED BY: RR	REVIEWED BY: JH
DATE: AUG. 2016	FIGURE NUMBER: FIGURE 2
PROJECT NUMBER: 748810-02180	REV: -

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Table 1
Drilling and Sampling Summary for FTMM-68 Letter Work Plan Addendum

TABLE 1
DRILLING AND SAMPLING SUMMARY FOR FTMM-68 LETTER WORK PLAN ADDENDUM
FORT MONMOUTH, NEW JERSEY

Location	Placement Relative to Estimated Dissolved Plume Footprint [1/]	**Drilling Scope by Location**					**Sampling During Geoprobe Boring [3/]**				**Sampling During Sonic Well Drilling [3/]**	**Sampling at Permanent Wells [3/ 4/]**		
		Geoprobe - MIP [2/]	Geoprobe - MIP/HPT [2/]	Geoprobe Confirmation Borings	Sonic - Permanent Double Cased Well	Sonic - Permanent Single Cased Well	DNAPL Screening	VOC+TiCs (SW8260C)	Reactive Mineral Analysis	CVOCs (AQR ColorTec Field Test Kit)	TOC (SW9060)	VOC+TICs (SW8260C)	Biogeochemical Indicator Parameter Suite	Microbial Census by qPCR
1	Upgradient	-	X [L]	X	-	X	-	X (SL)	-	X (GW)	-	X (GW)	X (GW)	TBD (GW)
2a	Source	-	X [R]	X	X	_	X (SL)	X (SL)	-	X (GW)	-	X (GW)	X (GW)	TBD (GW)
2b	Source	X [R]	-	X	-	-	X (SL)	X (SL)	-	-	-		-	-
2c	Source	X [R]	-	X	-	-	X (SL)	X (SL)	-	-	-		-	-
2d	Source	X [R]	-	X	-	-	X (SL)	X (SL)	-	-	-		-	-
3	Cross-gradient	-	X [L]	X	-	X	-	-	-	X (GW)	X (SL)	X (GW)	-	TBD (GW)
4	Plume Axis	-	X [R]	X	X	_	-	X (SL)	X (SL)	X (GW)	-	X (GW)	X (GW)	TBD (GW)
5	Cross-gradient	-	X [L]	X	-	X	-	-	-	X (GW)	X (SL)	X (GW)	-	TBD (GW)
6	Plume Axis	-	X [R]	X	X	-	-	X (SL)	X (SL)	X (GW)	-	X (GW)	X (GW)	TBD (GW)
7	Cross-gradient	-	X [L]	X	-	X	-	-	-	X (GW)	-	X (GW)	-	TBD (GW)
8	Downgradient	-	X [R]	X	-	X	-	-	-	X (GW)	X (SL)	X (GW)	X (GW)	TBD (GW)
9	Cross-gradient	-	X [L]	X	-	X	-	-	-	X (GW)	-	X (GW)	-	TBD (GW)
10	Cross-gradient	-	X [L]	X	-	X	-	-	-	X (GW)	-	X (GW)	-	TBD (GW)
Existing Monitoring Wells	N/A	-	-	-	-	-	-	-	-	-	-	X (GW)	5 wells along plume axis	TBD (GW)

Notes:

[1/] Refer to Figure 1 for proposed locations. N/A = not applicable.

[2/] MIP = membrane interface probe, HPT = hydraulic profiling tool, R = regular MIP, L = low level MIP.

[3/] See Table 2 for additional sampling details and number of samples per boring or well; SL = soil, GW = groundwater; TBD = to be determined based on results obtained at primary locations.

[4/] Microbial Census sampling locations will be determined following review of MIP/HPT and Geoprobe confirmation sampling results.

[5/] Up to two optional locations are TBD based on results obtained at the primary boring locations.

Table 2
Sampling Locations and Rationale for FTMM-68 Letter Work Plan Addendum

TABLE 2
SAMPLING LOCATIONS AND RATIONALE FOR FTMM-68 LETTER WORK PLAN ADDENDUM [a/]
FORT MONMOUTH, NEW JERSEY

Location	Number of Borings/Samples	Field Meter Readings [b/]	DNAPL Screening [c/]	VOC+TICs by EPA Method 8260C	VOCs by AQR ColorTec Field Test	TOC by EPA Method SW9060	Reactive Mineral Analysis [d/]	Biogeochemical Indicator Parameter Suite [e/]	Microbial Census by qPCR [f/]	Rationale
Soil										
Geoprobe confirmation borings at upgradient location #1 and source area locations #2a, 2b, 2c, 2d (Figure 1)	5 confirmation soil borings, up to 4 samples each	5 borings	up to 6 core samples from intervals exhibiting highest VOC concentrations based on MIP data	20	0	0	0	0	0	Samples will be collected at selected depth intervals based on MIP results to determine lateral and vertical extent of VOCs in source area soil.
Geoprobe confirmation borings at downgradient locations #4 and #6 (Figure 1)	2 confirmation soil borings, 1-3 samples each	2 borings	0	6	0	0	3	0	0	VOC samples (up to 3 per boring) will be collected from within the core of the downgradient plume using a Geoprobe to quantify the mass of VOCs sorbed to aquifer matrix material that represents a potential continuing source of VOCs dissolved in groundwater. Samples will represent both fine-grained (silt/clay) and coarse-grained (sand) intervals. Reactive mineral samples will be collected from relatively coarse-grained, permeable intervals that represent preferential groundwater and dissolved VOC migration pathways to allow evalution of abiotic VOC degradation potential along the migration pathway.
Sonic borings at downgradient location 8 and crossgradient locations 3 and 5 (Figure 1)	3 permanent monitoring well borings, up to 3-4 samples each	3 borings	0	0	0	10	0	0	0	TOC samples will be collected from relatively coarse-grained, permeable intervals that represent preferential groundwater and dissolved VOC migration pathways during sonic drilling of well borings to allow calculation of retardation coefficients for fate and transport analysis purposes. These samples will be collected from locations believed to be relatively uncontaminated in order to be representative of native organic carbon content and not anthropogenic VOCs.
Groundwater										
Geoprobe confirmation borings at locations 1, 2a, and 3-10 (Figure 1)	10 confirmation borings, average 2-3 samples each	10	0	5	25	0	0	0	0	Groundwater grab samples will be collected to quantify and confirm the MIP results and facilitate optimal location and screening of permanent monitoring wells that will provide definitive data to define the magnitude and vertical/lateral extent of VOCs in groundwater.
All new and existing permanent monitoring wells (Figure 1) [g/]	up to 19 wells, 1-2 samples each depending on need for vertical profiling	29	0	29	0	0	0	10	6	Samples will be collected to provide definitive data on VOC concentrations, and indicate whether biogeochemical conditions and microbial populations are conducive to natural attenuation (e.g., biodegradation) of VOCs. All new wells will be vertically profiled. Profiling has already been performed at existing wells that require this.
Total QA/QC Samples (see SAP for additional details) [h/]										
Field Duplicates (5% Sampling Frequency per medium)			0	3	0	0	0	0	0	
Matrix Spike (5% Sampling Frequency per medium)			0	3	0	0	0	0	0	
Matrix Spike Duplicate (5% Sampling Frequency per medium)			0	3	0	0	0	0	0	
Trip Blank (1 per cooler of VOCs per medium)			0	10	0	0	0	0	0	
QA Split (5% per medium)			0	3	0	0	0	0	0	
Equipment Blank (5% Sampling Frequency per medium)			0	3	0	0	0	0	0	
TOTAL SAMPLES		**NA**	**0**	**85**	**25**	**10**	**3**	**10**	**6**	

Notes:

[a/] Sample quantities are estimated maximums.

[b/] Field meter readings include, in soil samples: photoionization detector (PID) readings along entire soil column; and in groundwater: pH, temperature, electrical conductivity, dissolved oxygen, oxidation-reduction potential, and turbidity.

[c/] DNAPL Screening will be performed using NAPL FLUTE reactive material.

[d/] Reactive mineral analysis will include bioavailable iron, magnetic susceptibility, acid volatile and chromium reducible sulfide, total and ferrous iron, and total sulfur.

[e/] Biogeochemical suite includes nitrate (E353.2/E353.3), ferrous iron (Hach IR-18C field test), sulfate/sulfide/chloride (E300), dissolved gases (methane/ethane/ethene/carbon dioxide by AM20 GAX or equivalent), alkalinity (SM2320B), and dissolved organic carbon (SW9060, field filtered).

[f/] qPCR = quantitative polymerase chain reaction, performed by Microbial Insights laboratory.

[g/] Includes 10 new wells (excludes two optional locations) and 9 existing wells (565MW01, 565MW01D, 699MW09, 699MW16, FTMM53-MW02, FTMM68-MW01, FTMM68-MW02, FTMM68-MW03, FTMM68-MW04).

[h/] QA/QC = quality assurance/quality control; SAP = Sampling and Analysis Plan.

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: "FTMM- 68 LWPA Phase 2"

PERSON RESPONSIBLE FOR CONDUCTING THE REMEDIATION INFORMATION AND CERTIFICATION

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

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

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

Signature: William R Colvin Date: 09/29/2016

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