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

22 March 2017

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

SUBJECT: Request for No Further Action Determination for Groundwater at FTMM-12 Fort Monmouth, Oceanport, Monmouth County. PI G000000032

Attachments:

A. Previous Correspondence (see list below)
B. Figure 1 - FTMM-12 Location and Figure 2 - Layout of FTMM-12

Previous Correspondence (provided in Attachment A)

1. NJDEP letter to U.S. Army dated 5 February 2015, re: Approval 26 November 2014 Response to Comments on the Final Baseline Groundwater Sampling Report (August 2013)
2. NJDEP letter to U.S. Army dated 3 July 2014, re: Final Baseline Groundwater Sampling Report (August 2013)
3. Tables 2 and 3 Historical Groundwater Analytical Results and 2013 Baseline Groundwater Analytical Detections from August 2013 Baseline Groundwater Sampling Report

Dear Ms. Range:

The Army is requesting a No Further Action (NFA) determination by the New Jersey Department of Environmental Protection (NJDEP) for groundwater at FTMM-12. This request is based on the groundwater data results presented in the Final August 2013 Baseline Groundwater Sampling Report (Baseline Report) submitted to NJDEP in March 2014. NJDEP agreed with the report's recommendations to discontinue groundwater sampling at site FTMM-12 in their 5 February 2015 approval letter (**Attachment A.1**). The following summarizes the information provided in the Baseline Report that supports our request.

Background

FTMM-12 is a landfill (approximately 7.1 acres) located in the central portion of Fort Monmouth's (FTMM's) Main Post (MP). FTMM-12 is bordered by Husky Brook to the north, Murphy Drive to the east, multiple buildings to the south and Todd Avenue to the west (**Attachment B**). FTMM-12 was used for landfilling domestic and industrial waste from 1950 to 1966.

A long-term groundwater monitoring program began in February 1995. Groundwater sampling was conducted quarterly from June 1997 through May 2011 using a network of up to sixteen monitoring wells. Groundwater samples collected from May 1997 to November 2004 were analyzed for Target Analyte List (TAL) metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and PCBs. As agreed with NJDEP: a) from February 2005 to July 2011 samples were analyzed for TAL metals at monitor wells M12MW17, 18, 19, 20, 21, and 22 and for pesticides/PCBs and TAL metals at M12MW16, 23, 24, 25, and 26 (12 November 2004 email); b) starting in March 2009, the monitoring wells were only sampled for metals (date of agreement with NJDEP); and c) in July and September 2010, five additional monitoring wells (M12MW11, 12, 13, 14, and 15) were installed and, as agreed with NJDEP (date of agreement with NJDEP, these five wells were initially sampled for VOCs and metals, and then for metals only starting in November 2010.

In August 2013, groundwater sampling was conducted at FTMM-12 to re-establish baseline groundwater conditions following temporary suspension of groundwater sampling in late 2011. Groundwater samples were collected from sixteen monitoring wells using low flow purging and sampling (LFPS) methodology and analyzed for lead only. The results indicated that Lead was not detected above the NJDEP Groundwater Quality Standards (GWQS). These results are documented in the August 2013 Baseline Report.

Groundwater Chemistry

Groundwater data results from February 2008 through May 2011 and the August 2013 sampling event are presented in the tables in **Attachment A**.

Lead was not detected above NJDEP Groundwater Quality Standards (GWQS) in the samples collected during the 2013 sampling event.

Several metals (aluminum, antimony, arsenic, beryllium, cadmium, iron, lead, manganese, selenium, and sodium) were detected above their respective NJDEP GWQS during the most recent quarters of September 2009 through May 2011. However, only arsenic, manganese, selenium, and sodium were detected above their respective background concentrations and were attributed to background conditions and not indicative of historical site use. The NJDEP agreed that the metals were attributed to background conditions in their 3 July 2014 comment letter (**Attachment A**).

Summary

The 2013 groundwater results demonstrate that lead concentrations are below the NJDEP GWQS. Although several metals were detected above their respective NJDEP GWQS in the most recent eight quarters, those metals were attributed to background conditions and not to historical site use. Based on the groundwater chemistry and NJDEP's 2014 approval to discontinue sampling at FTMM-12, the Army requests a NFA determination by NJDEP for groundwater at FTMM-12.

The technical point of contact is Cris Grill who can be reached at 617-449-1583 or cris.grill@parsons.com. I can be reached at (732) 380-7064 or by email at william.r.colvin18.civ@mail.mil.

Sincerely,

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

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)

New Jersey Department of Environmental Protection
Site Remediation Program

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

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

Document: "Request for No Further Action Determination for Groundwater at FTMM-12"

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: 03/22/2017

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

Attachment A
NJDEP letter to U.S. Army dated 5 February 2015*, re: Approval* 26 November *2014 Response to Comments* on the Final Baseline Groundwater Sampling Report (August 2013); NJDEP letter to U.S. Army dated 3 July 2014, re: Final Baseline Groundwater Sampling Report (August 2013); and Table 2 and Table 3 of Final Baseline Groundwater Sampling Report (August 2013)

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

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

February 5, 2015

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

Approval

Re: *November 26, 2014 Response to Comments –on the Final Baseline Ground Water Sampling Report (August 2013)*
Fort Monmouth
Monmouth County
PI # G000000032
Activity Number: RPC000001

Dear Ms. Green:

The New Jersey Department of Environmental Protection (Department) has completed a review of the referenced Response to Comments dated November 26, 2014, submitted in response to the Department's comment letter dated July 3, 2014 regarding the Final Baseline Ground Water Sampling Report.

The *Response to Comments* agrees with or acknowledges the Department's comments for areas FTMM-03, FTMM-04, FTMM-05, FTMM-08, FTMM-12, FTMM-14, FTMM-22, FTMM-25, FTMM-53, FTMM-54, FTMM-55, FTMM-56, FTMM-57, FTMM-58, FTMM-59, FTMM-61, FTMM-64, and FTMM-66.

FTMM-18
The Department had indicated low-flow sampling must also be performed if Passive Diffusion Bag Sampling (PDBS) is conducted, for comparison purposes. The *Response to Comments* submittal contends as low-flow sampling has been historically conducted at this area, PDBS sampling only is appropriate. Based upon this reasoning, the Department agrees the performance via PDBS only is acceptable for the ensuing round of ground water sampling. The PDBS results are to be compared to the previous low-flow sampling results and presented in the forthcoming sampling report.

FTMM-68
The Department had expressed concern regarding the use of PDBS for long-term monitoring. FTMM-68 has not been fully characterized, and the use of PDBS for longer term monitoring is acceptable only for well characterized sites, as per the DEP's Field Sampling Procedures

Manual. As per information provided in the *Response to Comments* submittal, a Remedial Investigation to fully characterize the area is to be conducted in the near future using low-flow sampling methodology, and request approval for the use of PDBS to characterize contaminant concentrations in the interim. This is acceptable based on the stipulation that a full remedial investigation is to be performed. The November '14 *Response to Comments* (Section V), however, indicated the Remedial Investigation Workplan for FTMM-68 was awaiting DEP approval. Although some clarification was requested, the proposed remedial activities, soil and ground water, were approved for the FTMM-68 area via letter dated *January 8, 2014*, which addressed the RI/FS Workplan for FTMM-22, FTMM-53, FTMM-59 & FTMM-68.

If you have any questions, please contact me at (609)984-6606, or via email at Linda.Range@dep.nj.gov.

Sincerely,

Linda Range

Linda Range
Bureau of Case Management

cc: Joe Pearson, Calibre
Rick Harrison, FMERA
Joe Fallon, FMERA
Frank Barricelli, RAB

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

July 3, 2014

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

Re: Final Baseline Groundwater Sampling Report (August 2013)
Remedial Investigation/Feasibility Study/Decision Documents
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Ms. Green:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced report, dated March 2014, received on April 7, 2014. The report was prepared by Parsons Government Services Inc. (Parsons), in support of the Remedial Investigation (RI), Feasibility Study (FS), and Decision Documents project at Fort Monmouth.

A baseline ground water sampling event was conducted at 21 "sites" at the Fort Monmouth property in August 2013. The purpose of the sampling event was to re-establish baseline conditions following suspension of ground water sampling in late 2011, as well as to evaluate Fort Monmouth's long-term ground water sampling program, and the current analytical conditions of the ground water at each site. Sampling methodologies used included low-flow and passive diffusion bag samplers (PDBS). At four sites (FTMM-14, 18, 59, 68), only PDBS sampling was conducted. At three sites (FTMM-05, 22, 58) both low-flow and PDBS samples were obtained for comparison purposes. Fourteen (14) sites were only sampled using low-flow. The report states that PDBS concentrations were consistently biased somewhat low compared to the low-flow concentrations. The report concludes, however, that the PDBS results were still similar to the low-flow results and are considered representative of ground water conditions at the sites. Based on this conclusion, the report states that for future ground water sampling, PDBS will be used for all sites where volatile organic compounds (VOCs) are the sole contaminants of concern. Comments are presented below.

Section 3.1; Table 6; Appendices & associated Tables - *The "background concentrations" submitted in the 1995 Weston report were not accepted by the Department as representative of background conditions for Fort Monmouth. The study was not performed in accordance with Departmental protocol and is not a consideration in our evaluations/determinations. As indicated in Section 3.1, background concentrations are evaluated on a site by site basis.*

FTMM-02 Landfill

Historic sampling at this parcel indicated levels of VOCs above the Ground Water Quality Standard (GWQS); metals were previously determined to be reflective of naturally occurring conditions. The August 2013 sampling of wells using low-flow confirmed the continued exceedance of the GWQS for VOCs. The report recommends VOC sampling of wells M2MW03, M2MW11, M2MW21, M2MW22 and M2MW24 for two additional rounds using PDBS. Well M2MW10 will be monitored as a downgradient sentinel well. Although the proposal is acceptable, for wells in which the saturated screen length exceeds 10 feet, the deployment of multiple PDBS will be required. At any point where a decision is made to terminate ground water sampling at this site, confirmatory sampling using low-flow due to PDBS biasing low as compared to low-flow results at the Fort Monmouth site will be required.

FTMM-03 Landfill

Historic sampling at this parcel revealed GWQS exceedances of vinyl chloride and metals. The August 2013 sampling of wells using low-flow confirmed the continued exceedance of the GWQS for vinyl chloride in well 3MW07. Well 3MW02 was not sampled due to low water column and silty conditions, however, Table 4 of Appendix B recommends sampling of 3MW02 for VOCs and metals. The report attributes the presence of vinyl chloride to leaching of PVC piping from well 3MW07. A temporary well point investigation was conducted in 2009 to delineate the vinyl chloride, the results were non-detect, and abandonment of 3MW07 is recommended. The recommendations are acceptable. However, a figure presenting the locations and sampling results from the 2009 temporary well point investigation must be provided to the Department.

FTMM-04 Landfill

Historic sampling at this parcel revealed GWQS exceedances of various metals. The August 2013 sampling of wells using low-flow confirmed the continued exceedance of the GWQS for metals. The metals are attributed to background conditions, and cessation of ground water sampling is recommended. The recommendation is acceptable. Monitoring wells at this parcel shall be properly abandoned if they are no longer subject to sampling or gaging for water elevation data.

FTMM-05 Landfill

Historic sampling at this parcel revealed GWQS exceedances of PCE, TCE and vinyl chloride, which the August 2013 sampling, using low-flow and PDBS, confirmed. The report recommends annual VOC sampling of wells M5MW11, M5MW16, M5MW20 and M5MW23 using PDBS. The Department finds the proposal to be acceptable. At any point where a decision is made to terminate ground water sampling at this parcel, the Department will require confirmatory sampling using low-flow due to PDBS results at this parcel biased low compared to the low-flow results.

FTMM-08 Landfill

Historic sampling at this parcel revealed GWQS exceedances of pesticides, benzene, PCE and lead. The August 2013 sampling of wells using low-flow confirmed the exceedance of the GWQS for PCE and lead. The well with historic pesticide exceedances (697MW01) could not be located and was not sampled. The report recommends annual ground water sampling of well M8MW11 for VOCs and lead, M8MW12, 15, 16 and 24 for VOCs and M8MW17 and 21 for lead only. Monitoring well 697MW01 will be located and sampled for pesticides, lead and VOCs. The recommendation is acceptable.

FTMM-12 Landfill

Historic sampling at this parcel revealed GWQS exceedances of various metals, including arsenic and lead. Historic exceedances of metals except for lead are attributed to background quality. The August 2013 sampling was conducted for lead analysis only. Lead was not detected. The report recommends discontinuing ground water sampling at this parcel. The Department finds the recommendation to be acceptable. Monitoring wells at this parcel shall be properly abandoned if they are no longer subject to sampling or gaging for water elevation data.

FTMM-14 Landfill

Historic sampling at this parcel revealed no GWQS exceedances of VOCs. The August 2013 sampling of wells using PDBS confirmed that there was no exceedance of the GWQS. The report recommends discontinuing ground water sampling at this parcel. The Department finds the recommendation to be acceptable. Monitoring wells at this parcel shall be properly abandoned if they are no longer subject to sampling or gaging for water elevation data. The Department also notes that on Table 1, well M14MW19 is listed as having 10 feet of total screen length. However, the table also lists the saturated screen length as 13.35 feet. This discrepancy should be clarified.

FTMM-18 Landfill

Historic sampling at this parcel revealed GWQS exceedances of benzene and 1,2-DCA. The August 2013 sampling results of wells using PDBS showed the exceedance of the GWQS for 1,2-DCA in well M18MW22. Well M18MW23 could not be located and was not sampled. The report recommends annual ground water sampling using PDBS for M18MW22 and M18MW23 if it can be located. Every reasonable effort, such as reviewing the NJ State Plane Coordinates of the well, must be made to locate M18MW23. The use of M18MW22 as the sole monitoring well at this parcel will not be acceptable due to the vast difference in historical concentrations between M18MW22 and M18MW23. Historic 2011 benzene concentrations for M18MW23 were 775 ppb and 664 ppb while 2011 concentrations for M18MW22 were 1.81 ppb and 1.65 ppb. The Department cannot approve the use of PDBS sampling only for this parcel. Once M18MW23 is located, the Department can approve the use of both PDBS and low-flow sampling for comparison purposes.

FTMM-22 Former Wastewater Treatment Lime Pit

Historic sampling at this parcel revealed GWQS exceedances of TCE. The August 2013 sampling of wells using low-flow and PDBS confirmed the continued exceedance of the GWQS for TCE in ground water. The report recommends quarterly VOC sampling of wells CW1MW27, CW1MW29, CW1MW31 and CW1MW281 using PDBS. The Department finds the proposal to be acceptable. At any point where a decision is made to terminate ground water sampling at this parcel, the Department will require confirmatory sampling using low-flow due to PDBS results biasing low compared to low-flow results at the Fort Monmouth site.

FTMM-25 Landfill

Historic sampling at this parcel revealed GWQS exceedances of various metals. The August 2013 sampling of wells using low-flow confirmed the continued exceedance of the GWQS for metals. The metals are attributed to background conditions. The report recommends discontinuing ground water sampling at this parcel. The Department finds the recommendation to be acceptable. Monitoring wells at this parcel shall be properly abandoned if they are no longer subject to sampling or gaging for water elevation data.

FTMM-53 Building 699

Historic sampling at this parcel revealed GWQS exceedances of benzene, PCE, TCE, TBA, VOC TICs and lead. The August 2013 sampling of wells using low-flow showed the exceedance of the GWQS for benzene, xylenes, PCE, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene and VOC TICs. The report recommends quarterly VOC sampling of wells 699MW01, 699MW04, 699MW06, 699MW09, 699MW16, 699RW03, 699RW05 and 699RW11 using PDBS. The Department finds the proposal to be acceptable. For wells in which the saturated screen length exceeds 10 feet, the deployment of multiple PDBS will be required. At any point where a

decision is made to terminate ground water sampling at this parcel, the Department will require confirmatory sampling using low-flow due to PDBS biasing low compared to low-flow at the Fort Monmouth site.

FTMM-54 Building 296

Historic sampling at this parcel revealed GWQS exceedances of benzene, lead and arsenic. The metals are attributed to background conditions. The August 2013 sampling of wells using low-flow showed an exceedance of the GWQS for benzene. The report recommends annual VOC sampling of wells 269MW04 and 296MW06 using PDBS. The Department finds the proposal to be acceptable. For wells in which the saturated screen length exceeds 10 feet, the deployment of multiple PDBS will be required. At any point where a decision is made to terminate ground water sampling at this parcel, the Department will require confirmatory sampling using low-flow due to PDBS biasing low compared to low-flow at the Fort Monmouth site.

FTMM-55 Building 290

Historic sampling at this parcel revealed GWQS exceedances of arsenic and lead. The August 2013 sampling of wells using low-flow confirmed the continued exceedance of the GWQS for lead. The metals are attributed to background conditions. The report recommends discontinuing ground water sampling at this parcel. The Department finds the recommendation to be acceptable. Monitoring wells at this parcel shall be properly abandoned if they are no longer subject to sampling or gaging for water elevation data.

FTMM-56 Building 80

Historic sampling at this parcel revealed GWQS exceedances of chlordane, arsenic, lead and cadmium. The August 2013 sampling of wells was conducted for lead only using low-flow. There were no exceedances of lead. The report recommends one additional sampling round of well 80MW02 for chlordane and 80MW05 for lead. The Department finds the recommendation for well 80MW02 to be acceptable. The Department disagrees with the recommendation to sample well 80MW05 for lead only. The last low-flow sampling event in August 2011 had lead, arsenic and cadmium exceeding both the GWQS and background concentrations. Well 80MW05 shall be sampled during the next round for TAL metals.

FTMM-57 Building 108

Historic sampling at this parcel revealed GWQS exceedances of lead. In the August 2013 sampling event, there were no exceedances of lead in ground water. The report recommends two additional sampling rounds of well 108MW04 for lead. The Department finds the recommendation acceptable.

FTMM-58 Building 2567

Historic sampling at this parcel revealed GWQS exceedances of TBA in wells 2567MW01 and 2567MW03. The August 2013 sampling results using low-flow and PDBS were below the GWQS for TBA. The report recommends two annual sampling events for TBA analyses of wells 2567MW01 and 2567MW03 using low-flow. The Department finds the proposal to be acceptable.

FTMM-59 Building 1122

Historic sampling at this parcel revealed no GWQS exceedances for VOCs. The August 2013 sampling results of wells using PDBS showed no exceedance of VOCs. The text of the report recommends VOC sampling of well 1122MW07 for one additional sampling round to confirm the 2013 results because August 2013 was the first time this well was sampled. The Department finds the proposal to be acceptable. The Department also notes that there is a discrepancy between the recommendation in the text and the recommendation in Table 7. Table 7 recommends that sampling at this parcel be discontinued. Table 7 shall be amended to indicate well 1122MW07 will be sampled for VOCs using PDBS methodology.

FTMM-61 Building 283

Historic sampling at this parcel revealed GWQS exceedances of metals, benzene and VOC TICs in 283MW02. The August 2013 sampling of wells using low-flow for VOCs and lead showed no exceedances. The report recommends VOC sampling of well 283MW02 for one additional sampling round using PDBS methodology to confirm the 2013 results. The Department finds the proposal to be conditionally acceptable. If the saturated screen length exceeds 10 feet, the deployment of multiple PDBS will be required. If a decision is made to terminate ground water sampling at this parcel based on PDBS results, the Department will require confirmatory sampling using low-flow due to PDBS biasing low compared to low-flow at the Fort Monmouth site.

FTMM-64 Building 812

Historic sampling at this parcel revealed GWQS exceedances of benzene, vinyl chloride and metals. The August 2013 sampling of wells using low-flow for VOCs and lead showed no exceedances. The report recommends VOC sampling of well 812MW04 for one additional sampling round using PDBS methodology to confirm the 2013 results (however Section 5.0 recommends sampling be continued on an annual basis). The Department finds the proposal to be conditionally acceptable. If the saturated screen length exceeds 10 feet, the deployment of multiple PDBS will be required. If a decision is made to terminate ground water sampling at this

parcel based on PDBS results, the Department will require confirmatory sampling using low-flow due to PDBS biasing low compared to low-flow at the Fort Monmouth site.

FTMM-66 Building 886

Historic sampling at this parcel revealed GWQS exceedances of benzene, VOC TICs, arsenic and lead. The August 2013 sampling results from wells using low-flow showed the exceedance of the GWQS for SVOC TICs. The report recommends that sampling at this parcel be discontinued. The Department finds the recommendation unacceptable. Total SVOC TICs exceeded the GWQS of 500 ppb in wells 886RW01 and 886RW06. Ground water monitoring of wells 886RW01, 886RW06 and 886RW08 shall continue for SVOC+TICs using low-flow methodology.

FTMM-68 Building 700

There are no historic sampling results for this parcel. The August 2013 sampling results of wells using PDBS showed the exceedance of the GWQS for PCE, TCE, cis-1,2-DCE and vinyl chloride in wells 565MW01 and 565MW01D. The report recommends quarterly ground water sampling for VOC+TICs using PDBS for these 2 wells. The Department agrees with the recommendation of quarterly sampling, however, has concerns regarding the use of PDBS for long-term monitoring at this parcel. Unlike the other Fort Monmouth parcels, there are no historical ground water sampling data for comparison with the PDBS results. The DEP's Field Sampling Procedures Manual states that "the intended application of Passive Diffusion Bag Samplers (PDBS) is for long-term monitoring of volatile organic compounds (VOCs) in ground water at well-characterized sites." The Department would find long-term sampling of the wells using PDBS acceptable if low-flow sampling is conducted concurrently once or twice for comparison.

Finally, each of the above comments speak only to the ground water findings and recommendations included in the referenced submittal, rather than to the ground water at the entire site.

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

Linda S. Range

C: Joe Pearson, Calibre
Rick Harrison, FMERA
Julie Carver, Matrix
Frank Barricelli
Daryl Clark, BGWPA

Table 2
Historical Groundwater Analytical Results
Site FTMM-12
Fort Monmouth, New Jersey

				M12MW11					M12MW12					M12MW13				M12MW14				
Round No.	**NJDEP GWQS**	**USEPA MCL**	**Weston 1995 Background (Main Post)**	LF1	LF2	LF3	LF4	LF5	LF1	LF2	LF3	LF4	LF5	LF1	LF2	LF3	LF4	LF1	LF2	LF3	LF4	LF5
Date Collected				10/7/2010	10/22/2010	12/7/2010	3/1/2011	5/9/2011	10/8/2010	10/22/2010	11/30/2010	3/2/2011	5/9/2011	10/8/2010	11/30/2010	3/1/2011	5/9/2011	8/20/2010	10/22/2010	12/8/2010	3/3/2011	5/10/2011
ANALYTE/Lab ID				1043301	1045604	1053205	1107403	1119807	1043701	1045605	1052005	1107608	1119806	1043702	1052004	1107407	1119808	10357.01	1045606	1053405	1108101	1119903
Metals (µg/L)																						
Aluminum	200	NLE	121000	7630	2680	1440	4700	4220	1030	819	1050	<200	202	1420	951	987	458	393	774	<13	<200	1570
Antimony	6	6	20.70	5.98 ER	7.98 ER	5.35 ER	<6.0	<6.0	ND	ND	<4.7	<6.0	<6.0	5.24 ER	7.1 ER	<6.0	<6.0	ND	10	<4.7	<6.0	<6.0
Arsenic	3	10	89.30	ND	1.48 ER	3.56 ER	<3.0	<3.0	3.23 ER	1.06 ER	1.86 ER	<3.0	<3.0	ND	1.89 ER	<3.0	<3.0	0.68 ER	0.71 ER	4.84 ER	8.1	145
Barium	6000	2000	699.00	222	192	182	214	<200	272	266	278	<200	1360	223	252	317	<200	83.6	212	27	<200	<200
Beryllium	1	4	2.10	1.42	0.947	0.685	1	1.2	0.761	1.02	1.19	<1.0	<1.0	0.526	0.631	<1.0	<1.0	0.8	0.466 ER	<0.4	<1.0	<1.0
Cadmium	4	5	9.50	3.76	2.29	2.15	<3.0	<3.0	0.827 ER	0.789 ER	0.921 ER	<3.0	<3.0	1.43 ER	1 ER	<3.0	<3.0	0.68 ER	0.771 ER	1.02 ER	<3.0	<3.0
Calcium	NLE	NLE	45400.00	62100	58600	51900	50700	36400	21300	19200	18500	22100	17400	54200	64400	61100	20100	29800	57200	26500	23900	13700
Chromium	70	100	191.00	ND	ND	<0.6	<10	<10	ND	ND	<0.6	<10	<10	ND	<0.6	<10	<10	ND	ND	<0.6	<10	<10
Cobalt	NLE	NLE	18.30	30.4	17.3	10.8	<50	<50	4.64	4.35	4.85	<50	<50	16.6	7.3	<50	<50	8.07	9.86	0.575 ER	<50	<50
Copper	1300	1300	65.60	4.43 ER	1.82 ER	<0.8	<10	<10	ND	ND	<0.8	<10	<10	ND	<0.8	<10	<10	3.46 ER	ND	<0.8	<10	<10
Iron	300	NLE	431000	2790	5680	4760	609	855	9680	7280	4160	6000	21300	9410	3380	1840	5230	2600	5600	14400	15000	33100
Lead	5	15	22.70	ND	ND	<2.1	<3.0	<3.0	4.95 ER	4.81 ER	3.66 ER	<3.0	<3.0	ND	<2.1	<3.0	<3.0	ND	ND	3.27 ER	<3.0	<3.0
Magnesium	NLE	NLE	62700	19900	16500	14800	18300	14900	10900	10400	10600	7510	6420	14000	16100	16900	6440	9370	14300	4810	<5000	<5000
Manganese	50	NLE	331	378	284	238	310	242	100	78.6	74.6	125	197	240	239	256	89.3	114	213	170	169	129
Mercury	2	2	0.26	ND	ND	<0.254	<0.20	<0.20	ND	ND	<0.254	<0.2	<0.20	ND	<0.254	<0.20	<0.20	ND	ND	<0.254	<0.20	<0.20
Nickel	100	NLE	187	65.8	44	29.7	36.5	29.1	13.9	12.5	13.6	<10	<10	41.6	33.5	40.8	<10	28.9	36	10.9	24.1	<10
Potassium	NLE	NLE	137000	10100	9680	9860	<10000	<10000	8530	7820	8180	<10000	<10000	13600	16300	13500	<10000	4500	15500	4160	<10000	<10000
Selenium	40	50	29.60	ND	ND	1.38 ER	<10	<10	ND	ND	<1.36	<10	<10	ND	<1.36	<10	<10	57.2	1.37 ER	1.98 ER	<10	<10
Silver	40	NLE	ND	2.36 ER	1.13 ER	1.06 ER	<10	<10	ND	ND	1.39 ER	<10	<10	ND	<0.6	<10	<10	0.732 ER	1.19 ER	2.41 ER	<10	<10
Sodium	50000	NLE	21500	115000	102000	96100	155000	145000	38500	38300	38200	40300	45100	97400	125000	157000	170000	52200	96700	15900	24000	44800
Thallium	2	2	5.50	ND	ND	<0.53	<2.0	<2.0	ND	ND	<0.53	<2.0	<2.0	ND	<0.53	<2.0	<2.0	ND	ND	<0.53	<2.0	<2.0
Vanadium	NLE	NLE	108	1.09 ER	ND	<0.5	<50	<50	1.75 ER	ND	<0.5	<50	<50	1.89 ER	0.59 ER	<50	<50	ND	ND	<0.5	<50	<50
Zinc	2000	NLE	233	251	169	138	257	230	126	93.6	95.6	<20	<20	105	89.2	124	39.7	54.7	89.6	9.05 ER	27.2	23.7

Notes:

Shaded cells= concentrations exceed the NJDEP GWQS

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J = Estimated concentration exceeds the method detection limit (MDL) and is less than the reporting limit (RL)

NA = Not analyzed

ND = Not detected

NLE = No limit established

Table 2
Historical Groundwater Analytical Results
Site FTMM-12
Fort Monmouth, New Jersey

Round No.	NJDEP GWQS	USEPA MCL	Weston 1995 Background (Main Post)	M12MW15				M12MW16													
				LF1	LF2	LF3	LF4	46	46 Dup	47	48	48 Dup	49	49 Dup	50	51	52	53	54	LF1	LF2
Date Collected				8/20/2010	12/8/2010	3/1/2011	5/9/2011	3/7/2008	3/7/2008	5/15/2008	8/7/2008	8/7/2008	10/27/2008	10/27/2008	3/13/2009	6/25/2009	9/8/2009	11/18/2009	2/4/2010	6/4/2010	9/9/2010
ANALYTE/Lab ID				10357.02	1053404	1107404	1119809	80074.03	80074.02	80165.03	80286.03	80286.02	80390.03	80390.02	90109.03	90263.01	90370.03	90451.03	10049.03	10235.04	10382.08
Metals (µg/L)																					
Aluminum	200	NLE	121000	2370	5030	235	8590	ND	ND	ND	ND	ND	ND	ND	144	155	779	607	253	85.8 ER	112
Antimony	6	6	20.70	10.2	7.86	<6.0	<6.0	ND	ND	ND	ND	ND	1.39 ER	ND	12.8	2.31 ER	ND	ND	ND	7.81 ER	12.8
Arsenic	3	10	89.30	0.68 ER	4.83	<3.0	5.7	45.1	40.8	23.3	22	21.6	43.5	58.7	84.2	57.5	55	39.1	25.3	19.92	47.03
Barium	6000	2000	699.00	305	89.1	311	<200	110	113	53	118	118	286	282	102	97.8	205	213	84.9	69.3	135
Beryllium	1	4	2.10	0.815	<0.4	<1.0	<1.0	0.182 ER	0.173 ER	ND	0.131 ER	0.155 ER	1.03	1.37	0.109 ER	0.246 ER	0.651	0.628	0.106 ER	0.169 ER	0.231 ER
Cadmium	4	5	9.50	2.42	1.27	<3.0	<3.0	ND	ND	2.84	3.11	2.91	ND	ND	ND	0.441 ER	2.08	ND	ND	1.41 ER	2.46
Calcium	NLE	NLE	45400.00	59800	9460	32000	11600	17700	17700	17700	17700	17700	17700	17700	35800	39200	33400	41200	22700	25300	25800
Chromium	70	100	191.00	ND	32.5	<10	43.9	1.88 ER	1.85 ER	2.02 ER	0.901 ER	0.746 ER	0.732 ER	1.92 ER	1.82 ER	1.84 ER	ND	ND	ND	ND	1.78 ER
Cobalt	NLE	NLE	18.30	14.1	2.39	<50	<50	ND	ND	ND	ND	ND	ND	ND	0.336	1.07	2.85	3.49	0.793 ER	ND	1.47 ER
Copper	1300	1300	65.60	4.93 ER	13.7	<10	30.2	4.66 ER	4.29 ER	ND	ND	ND	ND	ND	ND	0.979 ER	ND	ND	ND	ND	ND
Iron	300	NLE	431000	5950	9340	119	16400	23300	23300	23300	23300	23300	23300	23300	53600	48100	38400	38300	31200	44500	50600
Lead	5	15	22.70	3.19 ER	8.27	<3.0	10.6	ND	ND	2.66 ER	2.97 ER	1.86 ER	ND	ND	10.2	ND	ND	ND	2.58 ER	ND	5.31
Magnesium	NLE	NLE	62700	20300	4970	7380	7340	5880	5880	5880	5880	5880	5880	5880	17400	16600	20800	23300	11500	12300	16600
Manganese	50	NLE	331	338	77.7	97.3	135	124	124	124	124	124	124	124	196	181	140	184	114	136	115
Mercury	2	2	0.26	ND	<0.254	<0.20	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09 ER	0.19 ER
Nickel	100	NLE	187	ND	14.9	34	20.7	7.2	6.92	0.934 ER	3.59 ER	3.43 ER	11.6	10.2	ND	2.55 ER	6.95	10.6	4.14 ER	1.98 ER	3.75 ER
Potassium	NLE	NLE	137000	12400	6070	<10000	<10000	2000	2000	2000	2000	2000	2000	2000	4110	4940	5990	6000	3410	4470	5920
Selenium	40	50	29.60	83.8	2.86	<10	<10	ND	ND	ND	ND	ND	ND	ND	29.6	13.4	20.8	ND	ND	NR	ND
Silver	40	NLE	ND	ND	<0.6	<10	<10	ND	ND	ND	ND	ND	ND	ND	ND	0.994	NA	ND	ND	7.37	7.22
Sodium	50000	NLE	21500	200000	112000	558000	118000	7680	7680	7680	7680	7680	7680	7680	22500	26600	52600	68100	26000	26200	60800
Thallium	2	2	5.50	ND	<0.53	<2.0	<2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	NLE	NLE	108	ND	21	<50	<50	NA	NA	NA	NA	NA	NA	NA	8.2	2.16 ER	7.24	8.69	5.54	ND	ND
Zinc	2000	NLE	233	108	50.3	31.5	80.3	NA	NA	NA	NA	NA	NA	NA	24.6	18.2 ER	71.1	56.2	27.5 ER	ND	13.7 ER

Notes:

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Table 2
Historical Groundwater Analytical Results
Site FTMM-12
Fort Monmouth, New Jersey

							M12MW17																
Round No.	**NJDEP GWQS**	**USEPA MCL**	**Weston 1995 Background (Main Post)**	LF3	LF4	LF5	46	47	47 Dup	48	49	50	50 Dup	51	52	53	54	LF1	LF1 Dup	LF2	LF3	LF4
Date Collected				11/30/2010	3/2/2011	5/9/2011	3/7/2008	5/15/2008	5/15/2008	8/7/2008	10/27/2008	3/13/2009	3/13/2009	6/8/2009	9/8/2009	11/18/2009	2/4/2010	6/2/2010	6/2/2010	9/8/2010	11/26/2010	3/2/2011
ANALYTE/Lab ID				1052003	1107609	1119804	80074.04	80165.04	80165.02	80286.04	80390.04	90109.04	90109.02	90221.04	90370.04	90451.04	10049.04	10226.03	10226.02	10379.04	1051301	1107607
Metals (µg/L)																						
Aluminum	200	NLE	121000	<13	<200	<200	ND	ND	ND	ND	ND	ND	ND	ND	20.3 ER	ND	44.6 ER	ND	ND	ND	<13	<200
Antimony	6	6	20.70	<4.7	<6.0	<6.0	ND	ND	ND	ND	ND	15.6	10.9	3.95 ER	ND	ND	ND	7.94 ER	5.34 ER	16.1	<4.7	<6.0
Arsenic	3	10	89.30	25.22	21.2	15.5	ND	ND	ND	ND	ND	83	80.6	27.7	21.6	0.77 ER	0.66 ER	ND	ND	0.67 ER	<0.62	<3.0
Barium	6000	2000	699.00	70.5	<200	<200	33.2	73	72.2	114	42.6	112	117	122	80.7	39.3	33.2	4.53 ER	4.64 ER	4.35 ER	4.33 ER	<200
Beryllium	1	4	2.10	<0.4	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.4	<1.0
Cadmium	4	5	9.50	1.58 ER	<3.0	<3.0	ND	1.37 ER	1.36 ER	2.1	0.294 ER	ND	ND	ND	1.54 ER	ND	ND	ND	ND	ND	<0.4	<3.0
Calcium	NLE	NLE	45400.00	47600	46100	41900	45700	45700	45700	45700	45700	46500	46900	43000	48500	51600	27100	46300	49200	45200	46400	41200
Chromium	70	100	191.00	<0.6	<10	<10	0.24 ER	0.486 ER	0.679 ER	ND	ND	ND	1.01 ER	ND	ND	ND	ND	ND	ND	ND	<0.6	<10
Cobalt	NLE	NLE	18.30	<0.3	<50	<50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.3	<50
Copper	1300	1300	65.60	<0.8	<10	<10	4.31 ER	ND	ND	ND	ND	ND	ND	1.29 ER	ND	ND	ND	ND	ND	ND	<0.8	<10
Iron	300	NLE	431000	29100	58700	43400	5230	5230	5230	5230	5230	22300	25900	20600	15100	8650	6830	ND	ND	ND	24.3	<100
Lead	5	15	22.70	3.88 ER	<3.0	<3.0	ND	ND	ND	1.83 ER	ND	6.17	4.44 ER	2.55 ER	ND	ND	ND	ND	ND	ND	<2.1	<3.0
Magnesium	NLE	NLE	62700	16600	17200	14500	2450	2450	2450	2450	2450	5150	5290	5410	5080	4040	2370	2270	2330	2170	2090	<5000
Manganese	50	NLE	331	255	289	240	64.3	64.3	64.3	64.3	64.3	176	182	167	132	78.1	64.6	7.83	7.64	7.3	7.55	<15
Mercury	2	2	0.26	<0.254	<0.20	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.06 ER	<0.254	<0.2
Nickel	100	NLE	187	0.953 ER	<10	<10	3.54 ER	ND	ND	ND	ND	ND	1.55 ER	ND	ND	ND	0.996 ER	ND	ND	ND	<0.7	<10
Potassium	NLE	NLE	137000	5520	<10000	<10000	3810	3810	3810	3810	3810	3610	3610	3850	4100	4530	2890	4620	4900	4320	8610	<10000
Selenium	40	50	29.60	<1.36	<10	<10	ND	ND	ND	ND	ND	72.7	70.8	ND	36.7	ND	ND	NR	NR	ND	<1.36	<10
Silver	40	NLE	ND	6.23	<10	<10	ND	ND	ND	ND	ND	ND	ND	0.597	ND	ND	ND	ND	ND	ND	<0.6	<10
Sodium	50000	NLE	21500	49900	31400	37700	5710	5710	5710	5710	5710	21000	22200	21800	19300	18000	9520	6560	6000	5060	4740 ER	<10000
Thallium	2	2	5.50	<0.53	<2.0	<2.0	ND	ND	ND	ND	1.69 ER	ND	ND	ND	ND	ND	ND	1.76 ER	ND	ND	<0.53	<2.0
Vanadium	NLE	NLE	108	1.77 ER	<50	<50	ND	ND	ND	ND	ND	1.97	2.78	0.753	2.19 ER	2.32 ER	2 ER	ND	ND	ND	0.562 ER	<50
Zinc	2000	NLE	233	<2.5	<20	<20	9.72	9.72	9.72	9.72	9.72	5.73	6.29	3.29	4.91 ER	2.88 ER	2.31 ER	ND	ND	ND	<2.5	<20

Notes:

Shaded cells= concentrations exceed the NJDEP GWQS

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Table 2
Historical Groundwater Analytical Results
Site FTMM-12
Fort Monmouth, New Jersey

	NJDEP GWQS	USEPA MCL	Weston 1995 Background (Main Post)		M12MW18															
Round No.				LF5	46	47	48	49	50	51	51 Dup	52	52 Dup	53	53 Dup	54	54 Dup	LF1	LF2
Date Collected				5/9/2011	3/7/2008	5/15/2008	8/7/2008	10/27/2008	3/13/2009	6/8/2009	6/8/2009	9/8/2009	9/8/2009	11/18/2009	11/18/2009	2/4/2010	2/4/2010	6/2/2010	9/8/2010
ANALYTE/Lab ID				1119805	80074.05	80165.05	80286.05	80390.05	90109.05	90221.05	90221.02	90370.05	90370.02	90451.05	90451.02	10049.05	10049.02	10226.04	10379.03
Metals (µg/L)																			
Aluminum	200	NLE	121000	<200	136	136	136	136	200	951	985	872	873	1040	1060	673	652	600	562
Antimony	6	6	20.70	<6.0	ND	ND	ND	ND	15.5	2.89 ER	2.53 ER	ND	ND	ND	ND	ND	ND	ND	5.49 ER
Arsenic	3	10	89.30	<3.0	ND	ND	ND	ND	32.3	14.3	14.7	9.26	6.83	1.11 ER	ND	ND	0.88 ER	ND	1.2 ER
Barium	6000	2000	699.00	<200	424	313	314	316	280	232	238	239	239	256	258	146	140	137	169
Beryllium	1	4	2.10	<1.0	1.11	0.87	0.823	0.94	0.809	0.746	0.767	0.767	0.792 ER	0.801	0.819 ER	0.446 ER	0.437 ER	0.554	0.655
Cadmium	4	5	9.50	<3.0	1.18 ER	0.946 ER	1.26 ER	1.05 ER	0.745 ER	0.633 ER	0.7 ER	0.739 ER	0.627 ER	ND	ND	ND	ND	ND	0.749 ER
Calcium	NLE	NLE	45400.00	42700	ND	ND	ND	ND	16300	15200	15500	14900	14800	16500	16500	9660	9210	10900	11600
Chromium	70	100	191.00	<10	0.417 ER	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	NLE	NLE	18.30	<50	ND	ND	ND	ND	2.32	2.07	2.02	2.39	2.46	2.23	2.69	1.06 ER	1.28 ER	1.57 ER	1.62 ER
Copper	1300	1300	65.60	<10	7.92	3.09 ER	1.63 ER	ND	0.846 ER	2.34 ER	2.41 ER	2.53 ER	2.92 ER	ND	ND	2.16 ER	1.16 ER	ND	2.26 ER
Iron	300	NLE	431000	17900	ND	ND	ND	ND	139	151	218 ER	198	197 ER	173 ER	254 ER	188 ER	248 ER	123 ER	256 ER
Lead	5	15	22.70	<3.0	ND	ND	ND	ND	5.67	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium	NLE	NLE	62700	<5000	ND	ND	ND	ND	10000	9200	9360	9190	9190	9840	9960	5720	5480	6740	7270
Manganese	50	NLE	331	176	ND	ND	ND	ND	38.7	36.5	37.1	37.1	37.2	37.8	38.7	23	22.3	26	28.5
Mercury	2	2	0.26	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	100	NLE	187	<10	15.2	10.3	9.39	8.75	6.77	8.67	8.85	7.06	7.25	9.12	9.03	6.3	6.26	5.44	5.66
Potassium	NLE	NLE	137000	<10000	ND	ND	ND	ND	7270	7610	7640	7620	7490	8010	8070	5020	4940	7020	7130
Selenium	40	50	29.60	<10	ND	5.85 ER	5.05 ER	ND	63.7	ND	ND	27	18	9.05 ER	ND	ND	ND	NR	ND
Silver	40	NLE	ND	<10	ND	ND	ND	ND	ND	ND	ND	0.677 ER	0.843 ER	0.514	ND	0.877 ER	ND	ND	ND
Sodium	50000	NLE	21500	24100	ND	ND	ND	ND	41200	36900	37100	37700	37800	45600	44700	26200	25500	35200	37200
Thallium	2	2	5.50	<2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.94 ER	ND
Vanadium	NLE	NLE	108	<50	ND	ND	ND	ND	1.19	0.547 ER	0.372 ER	ND	ND	0.627 ER	0.79 ER	1.15 ER	0.709 ER	ND	ND
Zinc	2000	NLE	233	21.4	28.4	28.4	28.4	28.4	66.9	69.7	70.1	74.3	73.9	70.8	72.3	42.7 ER	41.8 ER	50.2	55.9

Notes:

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Table 2
Historical Groundwater Analytical Results
Site FTMM-12
Fort Monmouth, New Jersey

Round No.	NJDEP GWQS	USEPA MCL	Weston 1995 Background (Main Post)	M12MW19																				
Date Collected				LF2 Dup	LF3	LF4	LF5	36	37	38	39	40	41	42	43	44	44 Dup	LF1	LF2	LF3	LF4	LF5		
ANALYTE/Lab ID				9/8/2010	11/26/2010	3/2/2011	5/9/2011	3/7/2008	5/15/2008	8/7/2008	10/27/2008	3/13/2009	6/8/2009	9/8/2009	11/18/2009	2/5/2010	2/5/2010	6/2/2010	9/8/2010	11/26/2010	3/2/2011	5/9/2011		
				10379.02	1051302	1107610	1119803	80074.06	80165.06	80286.06	80390.06	90109.06	90221.06	90370.06	90451.06	10052.03	10052.02	10226.05	10379.05	1051503	1107606	1119810		
Metals (µg/L)																								
Aluminum	200	NLE	121000	578	663	718	745	320	320	320	320	2610	574	211	24.9 ER	161	85.6 ER	ND	ND	<13	<200	<200		
Antimony	6	6	20.70	8.99 ER	<4.7	<6.0	<6.0	ND	ND	2.89 ER	ND	16.5	4.52 ER	ND	ND	ND	ND	4.91 ER	13.7	5.77 ER	<6.0	<6.0		
Arsenic	3	10	89.30	0.99 ER	<0.62	<3.0	<3.0	ND	ND	ND	ND	91.1	28.3	25.4	0.99 ER	0.69 ER	ND	ND	0.97 ER	<0.62	<3.0	<3.0		
Barium	6000	2000	699.00	169	169	<200	<200	9.88	27.4	12.3	11.8	9.24	8.72	7.92	16.9	3.43 ER	2.8 ER	5.81	6.08	6.35	<200	<200		
Beryllium	1	4	2.10	0.651	0.767 ER	<1.0	<1.0	ND	ND	ND	ND	1.15	0.124 ER	ND	ND	ND	ND	ND	ND	<0.4	<1.0	<1.0		
Cadmium	4	5	9.50	ND	0.671 ER	<3.0	<3.0	0.301 ER	0.374 ER	ND	0.88 ER	0.836 ER	0.219 ER	ND	ND	ND	ND	ND	ND	<0.4	<3.0	<3.0		
Calcium	NLE	NLE	45400.00	11700	12000	11400	10300	ND	ND	ND	ND	48000	48500	41200	70400	15000	13200	39200	42800	42400	37700	57400		
Chromium	70	100	191.00	ND	0.665 ER	<10	<10	0.215 ER	1.06 ER	ND	0.544 ER	1.07 ER	0.539 ER	ND	ND	ND	ND	ND	ND	<0.6	<10	<10		
Cobalt	NLE	NLE	18.30	1.46 ER	1.97 ER	<50	<50	ND	ND	ND	ND	ND	0.236 ER	ND	ND	ND	ND	ND	ND	<0.3	<50	<50		
Copper	1300	1300	65.60	ND	0.826 ER	<10	<10	2.91 ER	10.9	ND	3.57 ER	404	9.91	1.07 ER	ND	ND	ND	ND	ND	<0.8	<10	<10		
Iron	300	NLE	431000	207 ER	120	216	457	ND	ND	ND	ND	62.9	583	200 ER	3850	ND	ND	ND	262 ER	<132	417	2580		
Lead	5	15	22.70	ND	<2.10	<3.0	<3.0	ND	ND	ND	ND	18	1.57 ER	ND	ND	ND	ND	ND	ND	<2.10	<3.0	<3.0		
Magnesium	NLE	NLE	62700	7370	6910	6800	5830	ND	ND	ND	ND	4040	4050	3520	6370	1250	1110	3330	3540	3300	<5000	<5000		
Manganese	50	NLE	331	28.3	28.5	32	28.3	ND	ND	ND	ND	28.8	28.1	23.4	104	9.05	7.84	16.2	17.2	17.8	16.9	69.3		
Mercury	2	2	0.26	ND	<0.254	<0.2	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12 ER	<0.254	<0.2	<0.20		
Nickel	100	NLE	187	5.52	6.77	<10	<10	5.28	23.8	1.72 ER	0.775 ER	ND	3.41 ER	ND	3.05 ER	ND	ND	ND	ND	<0.7	<10	<10		
Potassium	NLE	NLE	137000	7040	9330	<10000	<10000	ND	ND	ND	ND	5930	6280	5240	6720	2940	2850	5200	5630	5620	<10000	<10000		
Selenium	40	50	29.60	ND	<1.36	<10	<10	ND	7.82 ER	8.01 ER	ND	79.5	ND	36.6	ND	19.9 ER	22.1	NR	ND	<1.36	<10	<10		
Silver	40	NLE	ND	ND	<0.6	<10	<10	NA	NA	NA	NA	ND	ND	1.67 ER	1.33 ER	1.48 ER	1.48 ER	ND	ND	<0.6	<10	<10		
Sodium	50000	NLE	21500	38200	40700	43400	40100	NA	NA	NA	NA	2130	3810 ER	3930 ER	17200	2480 ER	2350 ER	5720	3970 ER	4840 ER	<10000	<10000		
Thallium	2	2	5.50	ND	<0.53	<2.0	<2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.72 ER	ND	<0.53	<2.0	<2.0		
Vanadium	NLE	NLE	108	ND	<0.5	<50	<50	NA	NA	NA	NA	0.475	1.03 ER	0.796 ER	2.08 ER	ND	ND	ND	ND	<0.5	<50	<50		
Zinc	2000	NLE	233	55.7	53.9	61.8	59.9	NA	NA	NA	NA	460	102	29.4	17.6 ER	34.9 ER	20 ER	ND	11.4 ER	<2.5	25.8	<20		

Notes:

Shaded cells= concentrations exceed the NJDEP GWQS

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Table 2
Historical Groundwater Analytical Results
Site FTMM-12
Fort Monmouth, New Jersey

				M12MW20																					
Round No.	**NJDEP GWQS**	**USEPA MCL**	**Weston 1995 Background (Main Post)**	36		37		38		39		40		41		42		43		44		LF1		LF2		LF3	
Date Collected				3/7/2008		5/15/2008		8/7/2008		10/27/2008		3/13/2009		6/8/2009		9/8/2009		11/18/2009		2/4/2010		6/2/2010		9/8/2010		11/26/2010	
ANALYTE/Lab ID				80074.07		80165.07		80286.07		80390.07		90109.07		90221.07		90370.07		90451.07		10049.06		10226.06		10379.06		1051504	
Metals (µg/L)																									
Aluminum	200	NLE	121000	ND		ND		ND		ND		ND		ND		13.3		ND		44	ER	ND		ND		<13	
Antimony	6	6	20.70	ND		ND		ND		ND		18		1.48	ER	ND		ND		ND		ND		13.3		<4.7	
Arsenic	3	10	89.30	3.11	ER	ND		ND		ND		87.4		27		25		0.8	ER	1.17	ER	ND		ND		0.94	ER
Barium	6000	2000	699.00	41.9		44		44.6		31		34.1		30.9		28.6		30.4		22		25.6		26.1		12.9	
Beryllium	1	4	2.10	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		<0.4	
Cadmium	4	5	9.50	ND		0.979	ER	0.895	ER	0.391	ER	ND		ND		ND		ND		ND		ND		ND		<0.4	
Calcium	NLE	NLE	45400.00	ND		ND		ND		ND		46300		41300		41700		41700		25700		40700		41000		56000	
Chromium	70	100	191.00	0.494	ER	ND		0.359	ER	ND		ND		ND		ND		ND		ND		ND		ND		<0.6	
Cobalt	NLE	NLE	18.30	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		<0.3	
Copper	1300	1300	65.60	7.78		0.953	ER	22.1		ND		ND		1.32	ER	ND		ND		1.75	ER	ND		ND		<0.8	
Iron	300	NLE	431000	ND		ND		ND		ND		4270		4200		2580		3660		3860		1400		1500		<132	
Lead	5	15	22.70	ND		ND		ND		ND		6.82		1.47	ER	ND		ND		ND		ND		4.09	ER	<2.10	
Magnesium	NLE	NLE	62700	ND		ND		ND		ND		4300		3930		4010		3910		2350		3920		3770		5000	
Manganese	50	NLE	331	ND		ND		ND		ND		48.9		38.4		36.6		37.5		22.5		33.3		33.1		19.1	
Mercury	2	2	0.26	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		<0.254	
Nickel	100	NLE	187	3.52	ER	0.538	ER	1.96	ER	ND		ND		ND		ND		0.632	ER	1.25	ER	ND		ND		<0.7	
Potassium	NLE	NLE	137000	ND		ND		ND		ND		6100		5850		5590		5590		3560		5870		5630		7810	
Selenium	40	50	29.60	ND		5.85	ER	4.86	ER	ND		86.4		ND		39.2		ND		ND		NR		ND		<1.36	
Silver	40	NLE	ND	ND		ND		ND		ND		ND		ND		0.574		ND		ND		ND		ND		<0.6	
Sodium	50000	NLE	21500	ND		ND		ND		ND		5280		4510	ER	4870		6580		3580	ER	5920		4140	ER	10600	
Thallium	2	2	5.50	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		<0.53	
Vanadium	NLE	NLE	108	ND		ND		ND		ND		0.753		0.464	ER	0.931		1.54	ER	1.67	ER	ND		ND		<0.5	
Zinc	2000	NLE	233	25.9		25.9		25.9		25.9		14.5		4.6	ER	4.51		ND		4.72	ER	ND		1.35	ER	<2.5	

Round No.	LF4		LF5		36		37		38		39		40		41		42		43		44		LF1		LF2	
Date Collected	3/2/2011		5/9/2011		3/7/2008		5/15/2008		8/7/2008		10/27/2008		3/13/2009		6/8/2009		9/8/2009		11/18/2009		2/4/2010		6/2/2010		9/8/2010	
ANALYTE/Lab ID	1107603		1119811		80074.08		80165.08		80286.08		80390.08		90109.08													
Metals (µg/L)																									
Aluminum	<200		<200		ND		ND		ND		ND		ND												
Antimony	<6.0		<6.0		ND		ND		ND		ND		11.8												
Arsenic	<3.0		<3.0		ND		ND		2.78	ER	ND		109												
Barium	<200		<200		61.3		57.1		43.7		55		71.6												
Beryllium	<1.0		<1.0		ND		ND		ND		ND		ND												
Cadmium	<3.0		<3.0		ND		0.727	ER	ND		0.321	ER	ND												
Calcium	39600		40100		ND		ND		ND		ND		67100												
Chromium	<10		<10		ND		ND		ND		ND		ND												
Cobalt	<50		<50		ND		ND		ND		ND		ND												
Copper	<10		<10		3.54	ER	ND		ND		ND		ND												
Iron	11100		41100		ND		ND		ND		ND		8750												
Lead	<3.0		<3.0		ND		ND		ND		ND		2.4	ER											
Magnesium	<5000		<5000		ND		ND		ND		ND		6300												
Manganese	42.4		65.4		ND		ND		ND		ND		80.3												
Mercury	<0.2		<0.20		ND		ND		ND		ND		ND												
Nickel	<10		<10		3.22	ER	0.755	ER	1.04	ER	ND		ND												
Potassium	<10000		<10000		ND		ND		ND		ND		6530												
Selenium	<10		<10		ND		4.31	ER	6.04	ER	ND		106												
Silver	<10		<10		ND		ND		ND		ND		ND												
Sodium	<10000		<10000		ND		ND		ND		ND		9680												
Thallium	<2.0		<2.0		ND		ND		ND		ND		ND												
Vanadium	<50		<50		ND		ND		ND		ND		1.64												
Zinc	<20		<20		13.8		13.8		13.8		13.8		ND												

Round No.	LF3		
Date Collected	3/2/2011		
ANALYTE/Lab ID	1107603		
Metals (µg/L)			
Aluminum	<200		
Antimony	<6.0		
Arsenic	<3.0		
Barium	<200		
Beryllium	<1.0		
Cadmium	<3.0		
Calcium	39600		
Chromium	<10		
Cobalt	<50		
Copper	<10		
Iron	11100		
Lead	<3.0		
Magnesium	<5000		
Manganese	42.4		
Mercury	<0.2		
Nickel	<10		
Potassium	<10000		
Selenium	<10		
Silver	<10		
Sodium	<10000		
Thallium	<2.0		
Vanadium	<50		
Zinc	<20		

Notes:

Shaded cells= concentrations exceed the NJDEP GWQS

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Table 2
Historical Groundwater Analytical Results
Site FTMM-12
Fort Monmouth, New Jersey

Round No.	NJDEP GWQS	USEPA MCL	Weston 1995 Background (Main Post)	M12MW21										M12MW22								
				41	42	43	44	LF1	LF2	LF2 Dup	LF3	LF4	LF5	36	37	38	39	40	41	42	43	44
Date Collected				6/8/2009	9/8/2009	11/18/2009	2/5/2010	6/3/2010	9/9/2010	9/9/2010	11/26/2010	03/01/11	05/09/11	3/7/2008	5/15/2008	8/7/2008	10/27/2008	3/13/2009	6/8/2009	9/8/2009	11/18/2009	2/5/2010
ANALYTE/Lab ID				90221.08	90370.08	90451.08	10052.04	10234.04	10382.03	10382.02	1051505	1107409	1119812	80074.09	80165.09	80286.09	80390.09	90109.09	90221.09	90370.09	90451.09	10052.05
Metals (µg/L)																						
Aluminum	200	NLE	121000	ND	16	126	227	ND	ND	ND	<13	<200	<200	ND	ND	ND	ND	80	140	134	ND	ND
Antimony	6	6	20.70	6.2 ER	ND	7.79 ER	ND	8.59 ER	18.9	20.2	6.16 ER	<6.0	<6.0	ND	ND	ND	4.48 ER	11	4.28 ER	ND	ND	ND
Arsenic	3	10	89.30	26.1	26.8	1.74 ER	1.1 ER	ND	1.3 ER	1.17 ER	1.1 ER	<3.0	<3.0	25.5	93.4	68.8	55.8	113	110	64.8	96.1	47.2
Barium	6000	2000	699.00	65.1	56.7	64.3	50.5	50.6	57	60.9	54.9	<200	<200	42.5	50.3	60.8	45.9	50.9	50.8	50.3	52	24.2
Beryllium	1	4	2.10	ND	ND	ND	ND	ND	ND	ND	<0.4	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	4	5	9.50	ND	ND	ND	ND	ND	0.799 ER	0.776 ER	<0.4	<3.0	<3.0	ND	8.2	10.3	ND	ND	ND	4.34	ND	0.565 ER
Calcium	NLE	NLE	45400.00	64500	61700	64700	36000	62600	65300	69600	65700	61900	66300	30900	30900	30900	30900	35800	39300	24900	41200	21900
Chromium	70	100	191.00	ND	ND	ND	ND	ND	ND	ND	<0.6	<10	<10	0.362 ER	ND	0.84 ER	ND	ND	0.92 ER	ND	ND	ND
Cobalt	NLE	NLE	18.30	ND	ND	ND	ND	ND	ND	ND	<0.3	<50	<50	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	1300	1300	65.60	ND	ND	ND	ND	ND	ND	ND	<0.8	<10	<10	4.39 ER	ND	ND	ND	ND	ND	ND	ND	ND
Iron	300	NLE	431000	13200	ND	10000	7090	6950	8590	9090	6940	18200	44700	124000	124000	124000	124000	94900	82500	98500	92900	44200
Lead	5	15	22.70	3.45 ER	ND	ND	ND	ND	ND	ND	2.47 ER	<3.0	<3.0	ND	8.49	11.6	ND	12	ND	5.02	6.04	ND
Magnesium	NLE	NLE	62700	6110	6150	6450	3830	6440	6860	7280	6670	6080	6110	8110	8110	8110	8110	10400	10200	8350	10600	5350
Manganese	50	NLE	331	67.2	79.5	83.5	48.9	88	99.6	106	105	103	119	550	550	550	550	418	379	357	387	201
Mercury	2	2	0.26	ND	ND	ND	ND	ND	0.18 ER	0.11 ER	<0.254	<0.2	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	100	NLE	187	ND	ND	0.644 ER	1.02 ER	ND	ND	ND	<0.7	<10	<10	2.08 ER	ND	1.38 ER	ND	ND	ND	ND	ND	ND
Potassium	NLE	NLE	137000	6360	5950	6620	5090	6280	6570	6920	7610	<10000	<10000	3010	3010	3010	3010	4160	4560	4880	4460	2390
Selenium	40	50	29.60	8.17 ER	44.9	ND	30.1	NR	ND	ND	<1.36	<10	<10	ND	ND	ND	ND	ND	3.39 ER	ND	ND	ND
Silver	40	NLE	ND	ND	ND	ND	ND	ND	ND	ND	1.28 ER	<10	<10	ND	ND	ND	ND	ND	2.02 ER	ND	ND	ND
Sodium	50000	NLE	21500	9320	8450	9080	6430	8560	7440	8500	7750	<10000	<10000	2000	2000	2000	2000	32800	32200	28800	33900	15600
Thallium	2	2	5.50	ND	ND	ND	ND	ND	0.85 ER	ND	<0.53	<2.0	<2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	NLE	NLE	108	0.712 ER	1.44	2.45 ER	1.83 ER	ND	ND	ND	<0.5	<50	<50	ND	ND	ND	ND	7.7	1.61 ER	12.1	14.3	5.05
Zinc	2000	NLE	233	ND	3.47	ND	2.92 ER	ND	ND	ND	<2.5	<20	<20	ND	ND	ND	ND	11	4.44 ER	5.55 ER	ND	3.56 ER

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Table 2
Historical Groundwater Analytical Results
Site FTMM-12
Fort Monmouth, New Jersey

Round No.	NJDEP GWQS	USEPA MCL	Weston 1995 Background (Main Post)	LF1		LF1 Dup		LF2		LF3		LF4	LF5	M12MW23																					
				36		37		38		39		40		41		42		43		44		LF1		LF2		LF3		LF4							
Date Collected				6/4/2010		6/4/2010		9/9/2010		12/7/2010		3/1/2011	5/10/2011	3/7/2008		5/15/2008		8/7/2008		10/27/2008		3/13/2009		6/8/2009		9/8/2009		11/18/2009		2/4/2010		6/4/2010		9/10/2010		12/7/2010		3/1/2011	
ANALYTE/Lab ID				10235.03		10235.02		10382.07		1053203		1107408	#########	80074.1		80165.1		80286.1		80390.1		90109.1		90221.1		90370.1		90451.1		10049.07		10235.05		10384.01		1053203		1107405	
Metals (µg/L)																																			
Aluminum	200	NLE	121000	ND		ND		ND		<13		<200	<200	3940		3940		3940		3940		4650		1350		5130		1270		1460		3790		7780		483		1340	
Antimony	6	6	20.70	9.83	ER	11.8		17.7		<4.7		<6.0	<6.0	ND		ND		ND		ND		7.04	ER	3.14	ER	ND		ND		ND		6.75	ER	12.8		<4.7		<6.0	
Arsenic	3	10	89.30	136		122		47.82		81.6		113	76.4	2.8	ER	ND		ND		2.6	ER	56.8		17.9		15		1.05	ER	ND		0.74	ER	3.67	ER	1.51	ER	<3.0	
Barium	6000	2000	699.00	48.8		51.6		43.6		54.6		<200	<200	44.9		46.8		31.8		40.8		36.5		46.7		31.6		57		27.7		70.3		46.5		42.9		<200	
Beryllium	1	4	2.10	0.138	ER	0.143	ER	ND		<0.4		<1.0	<1.0	ND		ND		1.84		1.87		0.931		0.574		1.67		0.568		0.271	ER	1.23		2.05		<0.4		<1.0	
Cadmium	4	5	9.50	2.43		2.72		3.65		7.53		<3.0	<3.0	0.741	ER	0.634	ER	1.71	ER	2.27		1.14	ER	0.782	ER	1.95	ER	1.13	ER	ND		1.86	ER	2	ER	1.07	ER	<3.0	
Calcium	NLE	NLE	45400.00	49700		50400		28500		47000		65800	38700	ND		ND		ND		ND		23800		17700		25700		17700		9620		26900		34700		8150		6630	
Chromium	70	100	191.00	ND		ND		ND		<0.6		<10	<10	1.71	ER	1.97	ER	1.6	ER	2.4	ER	1.17	ER	0.472	ER	ND		ND		2.59	ER	ND		2.04	ER	2.53	ER	10.4	
Cobalt	NLE	NLE	18.30	ND		ND		ND		<0.3		<50	<50	ND		ND		ND		ND		4.17		3.05		6.35		2.73		1.25	ER	7.36		8		<0.3		<50	
Copper	1300	1300	65.60	ND		ND		ND		<0.8		<10	<10	6.07		3.92	ER	5.99		3.82	ER	3.7	ER	2.63	ER	4.32	ER	ND		2.22	ER	3.41	ER	2.49	ER	3.01	ER	11.2	
Iron	300	NLE	431000	72900		76600		74800		109000		105000	74000	ND		ND		ND		ND		133		236		273		85.4	ER	441	ER	520		2760		528		1910	
Lead	5	15	22.70	7		4.83	ER	7.19		14.5		<3.0	<3.0	ND		ND		ND		1.5	ER	4.83	ER	2.4	ER	ND		ND		ND		2.78	ER	5.49		3.21	ER	<3.0	
Magnesium	NLE	NLE	62700	10900		11100		7600		11400		12700	8990	ND		ND		ND		ND		5410		4000		5770		4030		2530		6420		7750		2670		<5000	
Manganese	50	NLE	331	338		343		285		439		485	354	ND		ND		ND		ND		147		1.03		183		83.4		51.1		187		230		19.2		19.9	
Mercury	2	2	0.26	0.07	ER	0.07	ER	0.18	ER	<0.254		<0.2	<0.20	ND		ND		ND		ND		ND		ND		ND		ND		ND		0.07	ER	ND		<0.254		<0.2	
Nickel	100	NLE	187	0.65	ER	0.579	ER	ND		1.28	ER	<10	<10	10.7		7.95		29.9		30.8		20.1		16.7		25.7		18		10.8		32.4		36.3		8.29		<10	
Potassium	NLE	NLE	137000	3240		3320		4170		5330		<10000	<10000	ND		ND		ND		ND		1970		2200		2970		2140		1560		2770		3820		1990		<10000	
Selenium	40	50	29.60	NR		NR		ND		<1.36		<10	<10	ND		3.94	ER	5.07	ER	ND		65.9		ND		30.2		10.9	ER	ND		NR		ND		1.64	ER	<10	
Silver	40	NLE	ND	11.7		11.7		10.8		<0.6		<10	<10	ND		ND		ND		ND		ND		ND		1.43	ER	0.808	ER	0.617	ER	ND		ND		<0.6		<10	
Sodium	50000	NLE	21500	29700		29400		24300		32700		31200	32100	ND		ND		ND		ND		25500		19800		32500		20800		13600		34100		49400		15400		15400	
Thallium	2	2	5.50	ND		ND		ND		<0.53		<2.0	<2.0	ND		ND		ND		ND		ND		ND		ND		NA		ND		ND		ND		<0.53		<2.0	
Vanadium	NLE	NLE	108	ND		ND		ND		<0.5		<50	<50	ND		ND		ND		ND		0.804		0.908		0.662	ER	0.839	ER	1.52	ER	0.711	ER	2.33		0.709	ER	<50	
Zinc	2000	NLE	233	ND		ND		ND		<2.5		<20	<20	149		149		149		149		116		99.5		125		114		74.7		190		200		109		85	

Notes:

Shaded cells= concentrations exceed the NJDEP GWQS

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ER = Estimated result

J = Estimated concentration exceeds the method detection limit (MDL) and is less than the reporting limit (RL)

NA = Not analyzed

ND = Not detected

NLE = No limit established

Table 2
Historical Groundwater Analytical Results
Site FTMM-12
Fort Monmouth, New Jersey

	NJDEP GWQS	USEPA MCL	Weston 1995 Background (Main Post)		M12MW24																
Round No.				LF5	36	37	38	39	40	41	42	43	44	LF1	LF2	LF3	LF4	LF5	36	37	38
Date Collected				5/10/2011	3/7/2008	5/15/2008	8/7/2008	10/27/2008	3/13/2009	6/8/2009	9/8/2009	11/18/2009	2/4/2010	6/3/2010	9/9/2010	11/26/2010	3/1/2011	5/10/2011	3/7/2008	5/15/2008	8/7/2008
ANALYTE/Lab ID				1119907	80074.11	80165.11	80286.11	80390.11	90109.11	90221.11	90370.11	90451.11	10049.08	10234.05	10382.05	1051507	1107406	1119904	80074.12	80165.12	80286.12
Metals (µg/L)																					
Aluminum	200	NLE	121000	2280	1170	1170	1170	1170	2480	466	948	4510	3220	6000	6710	6680	6640	3680	ND	ND	ND
Antimony	6	6	20.70	<6.0	ND	ND	ND	ND	18.6	2.37 ER	ND	ND	ND	6.25 ER	13.9	7.51 ER	<6.0	<6.0	ND	ND	ND
Arsenic	3	10	89.30	<3.0	ND	ND	ND	ND	72.8	16.7	17.3	0.82 ER	ND	ND	1.24 ER	<0.62	<3.0	<3.0	ND	ND	3.01 ER
Barium	6000	2000	699.00	<200	49.7	33.5	30.1	60	43.6	27.1	39.9	53.3	37.6	56.7	61.3	65	<200	<200	29.1	25.7	66.8
Beryllium	1	4	2.10	<1.0	0.553	0.203 ER	ND	1.44	0.765	0.193 ER	0.432 ER	1.24	0.677	1.35	1.78	1.83 ER	1	<1.0	ND	ND	ND
Cadmium	4	5	9.50	<3.0	0.454 ER	0.689 ER	0.359 ER	1.41 ER	ND	ND	ND	ND	0.817 ER	1 ER	1.05 ER	1.02 ER	<3.0	<3.0	ND	ND	0.578 ER
Calcium	NLE	NLE	45400.00	20400	ND	ND	ND	ND	31200	22600	25900	44900	32800	53800	52500	56700	54900	46400	NA	NA	NA
Chromium	70	100	191.00	<10	ND	0.473 ER	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.6	<10	<10	1.26 ER	0.873 ER	ND
Cobalt	NLE	NLE	18.30	<50	ND	ND	ND	ND	8.27	3.1	5.1	14.2	8.91	15.8	18.5	18.6	<50	<50	NA	NA	NA
Copper	1300	1300	65.60	<10	6.2	1.35 ER	ND	0.821 ER	ND	0.928 ER	ND	ND	1.59 ER	ND	4.06 ER	5.58	<10	<10	8.7	7.35	ND
Iron	300	NLE	431000	716	ND	ND	ND	ND	2590	1590	2000	1840	2240	2070	3600	1580	1990	3110	372	372	372
Lead	5	15	22.70	<3.0	ND	ND	ND	ND	4.67 ER	ND	ND	ND	ND	ND	ND	<2.1	<3.0	<3.0	ND	ND	ND
Magnesium	NLE	NLE	62700	<5000	ND	ND	ND	ND	6510	3590	4940	10000	6800	11900	12300	12100	11300	8670	5370	5370	5370
Manganese	50	NLE	331	269	ND	ND	ND	ND	251	152	248	365	257	433	467	467	474	331	27	27	27
Mercury	2	2	0.26	<0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.21 ER	<0.254	<0.2	<0.20	ND	ND	ND
Nickel	100	NLE	187	25.9	12.7	5.51	2.29 ER	25.6	7.94	4.86 ER	5.57	19.2	12.4	18.7	24.7	23.4	23	14.6	6.82	2.2 ER	ND
Potassium	NLE	NLE	137000	<10000	ND	ND	ND	ND	4730	5330	6340	6490	4870	6260	7370	8520	<10000	<10000	5750	5750	5750
Selenium	40	50	29.60	<10	ND	6.05 ER	6.31 ER	ND	92.4	ND	35.3	13.6 ER	16.8 ER	NR	ND	<1.36	<10	<10	ND	7.22 ER	8.74 ER
Silver	40	NLE	ND	<10	ND	ND	ND	ND	ND	ND	0.559 ER	1.14 ER	1.72 ER	ND	ND	<0.6	<10	<10	ND	ND	ND
Sodium	50000	NLE	21500	28200	ND	ND	ND	ND	62300	29500	45900	93100	61900	111000	108000	115000	112000	88900	24600	24600	24600
Thallium	2	2	5.50	<2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.21 ER	ND	<0.53	<2.0	<2.0	ND	ND	ND
Vanadium	NLE	NLE	108	<50	ND	ND	ND	ND	0.506	0.511 ER	ND	1.05 ER	1.31 ER	ND	ND	<0.5	<50	<50	ND	ND	ND
Zinc	2000	NLE	233	179	51	51	51	51	129	51.1	83	195	137	228	278	270	270	187	14.9	14.9	14.9

Notes:

Shaded cells= concentrations exceed the NJDEP GWQS

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Table 2
Historical Groundwater Analytical Results
Site FTMM-12
Fort Monmouth, New Jersey

				M12MW25																					
Round No.	**NJDEP GWQS**	**USEPA MCL**	**Weston 1995 Background (Main Post)**	39		40		41		42		43		44		LF1		LF2		LF3		LF4		LF5	
Date Collected				10/27/2008		3/13/2009		6/8/2009		9/8/2009		11/18/2009		2/5/2010		6/3/2010		9/9/2010		12/8/2010		3/2/2011		5/10/2011	
ANALYTE/Lab ID				80390.12		90109.12		90221.12		90370.12		90451.12		10052.06		10234.06		10382.06		1053403		1107605		1119905	
Metals (µg/L)																									
Aluminum	200	NLE	121000	ND		ND		ND		24	ER	32.2	ER	62.2	ER	ND		32.1	ER	<13		<200		<200	
Antimony	6	6	20.70	ND		21		2.79	ER	ND		5.87	ER	5.23	ER	6.44	ER	15.5		6.35	ER	<6.0		<6.0	
Arsenic	3	10	89.30	ND		111		29.2		29.2		0.7	ER	1.69	ER	ND		0.89	ER	1.42	ER	<3.0		<3.0	
Barium	6000	2000	699.00	256		31.4		38.2		58.3		78		22.5		15.3		14.3		13.2		<200		<200	
Beryllium	1	4	2.10	ND		ND		ND		ND		ND		ND		ND		ND		<0.4		<1.0		<1.0	
Cadmium	4	5	9.50	0.404	ER	ND		ND		ND		ND		ND		ND		ND		<0.4		<3.0		<3.0	
Calcium	NLE	NLE	45400.00	NA		70200		62000		78300		65500		30000		50800		55500		53100		52100		71100	
Chromium	70	100	191.00	ND		0.438	ER	ND		ND		ND		ND		ND		ND		<0.6		<10		<10	
Cobalt	NLE	NLE	18.30	NA		ND		ND		ND		ND		ND		ND		ND		<0.3		<50		<50	
Copper	1300	1300	65.60	ND		0.746	ER	1.04	ER	ND		ND		1.08	ER	ND		ND		<0.8		<10		<10	
Iron	300	NLE	431000	372		4190		5250		9230		4900		3350		ND		213	ER	<132		<100		16500	
Lead	5	15	22.70	ND		2.77	ER	1.33	ER	ND		ND		ND		ND		ND		3.23	ER	<3.0		<3.0	
Magnesium	NLE	NLE	62700	5370		9490		8830		13000		14700		4220		4590		5120		4700		<5000		10200	
Manganese	50	NLE	331	27		99.4		88.2		147		101		43.3		18.2		20.6		18.7		16.9		155	
Mercury	2	2	0.26	ND		ND		ND		ND		ND		ND		ND		ND		<0.254		<0.2		<0.2	
Nickel	100	NLE	187	ND		ND		1.38	ER	ND		0.821	ER	ND		ND		ND		0.802	ER	<10		<10	
Potassium	NLE	NLE	137000	5750		7710		8350		8990		9010		4680		6480		6870		7160		<10000		<10000	
Selenium	40	50	29.60	ND		91.5		5.85	ER	48.8		11.5	ER	36.1		NR		ND		1.64	ER	<10		<10	
Silver	40	NLE	ND	ND		ND		ND		ND		0.593		1.04	ER	ND		ND		<0.6		<10		<10	
Sodium	50000	NLE	21500	24600		45500		32900		69500		104000		22200		9170		8530		8490		<10000		66200	
Thallium	2	2	5.50	2.15	ER	ND		ND		ND		ND		ND		ND		ND		<0.53		<2.0		<2.0	
Vanadium	NLE	NLE	108	ND		2.14		1.04	ER	2.12	ER	2.56	ER	1.5	ER	ND		ND		<0.5		<50		<50	
Zinc	2000	NLE	233	14.9		ND		9.84	ER	4.35	ER	ND		11.6	ER	ND		ND		<2.5		<20		<20	

				M12MW25																					
Round No.	**NJDEP GWQS**	**USEPA MCL**	**Weston 1995 Background (Main Post)**	36		37		38		39		40		41		42									
Date Collected				3/7/2008		5/15/2008		8/7/2008		10/27/2008		3/13/2009		6/8/2009		9/8/2009									
ANALYTE/Lab ID				80074.13		80165.13		80286.13		80390.13		90109.13		90221.13		90370.13									
Metals (µg/L)																									
Aluminum	200	NLE	121000	373		373		373		373		ND		141		82.9	ER								
Antimony	6	6	20.70	ND		ND		ND		ND		15.1		3.69	ER	ND									
Arsenic	3	10	89.30	6.37		4.06	ER	3.44	ER	ND		76.2		11.5		20.4									
Barium	6000	2000	699.00	78.7		41.9		46.1		41.4		38.5		19.7		31.8									
Beryllium	1	4	2.10	0.379	ER	0.295	ER	ND		0.117	ER	ND		0.114	ER	ND									
Cadmium	4	5	9.50	0.822	ER	1.65	ER	0.454	ER	1.24	ER	ND		ND		ND									
Calcium	NLE	NLE	45400.00	ND		ND		ND		ND		34000		12600		33300									
Chromium	70	100	191.00	1.21	ER	1.74	ER	ND		2.32	ER	ND		1.12	ER	ND									
Cobalt	NLE	NLE	18.30	NA		NA		NA		NA		ND		ND		ND									
Copper	1300	1300	65.60	15.9		5.97		ND		ND		1.15	ER	3.84	ER	ND									
Iron	300	NLE	431000	ND		ND		ND		ND		2950		2450		3400									
Lead	5	15	22.70	ND		2.16	ER	ND		ND		5.56		ND		ND									
Magnesium	NLE	NLE	62700	ND		ND		ND		ND		3630		1500		3590									
Manganese	50	NLE	331	ND		ND		ND		ND		35.8		30.1		36.1									
Mercury	2	2	0.26	ND		ND		ND		ND		ND		ND		ND									
Nickel	100	NLE	187	5.17		1.65	ER	0.65	ER	ND		ND		2.27	ER	ND									
Potassium	NLE	NLE	137000	ND		ND		ND		ND		4710		2320		5250									
Selenium	40	50	29.60	ND		ND		6.88	ER	ND		78.7		ND		36.2									
Silver	40	NLE	ND	ND		ND		ND		ND		ND		ND		ND									
Sodium	50000	NLE	21500	ND		ND		ND		ND		9290		14300		4930	ER								
Thallium	2	2	5.50	ND		ND		ND		ND		ND		ND		ND									
Vanadium	NLE	NLE	108	1.53		1.53		1.53		1.53		1.53	ER	1.55	ER	2.08	ER								
Zinc	2000	NLE	233	65.4		65.4		65.4		65.4		11.7	ER	87.9		5.39	ER								

Notes:

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Table 2
Historical Groundwater Analytical Results
Site FTMM-12
Fort Monmouth, New Jersey

	NJDEP GWQS	USEPA MCL	Weston 1995 Background (Main Post)	M12MW26							
Round No.				43	44	LF1	LF1 Dup	LF2	LF3	LF4	LF5
Date Collected				11/18/2009	2/4/2010	6/3/2010	6/3/2010	9/9/2010	11/26/2010	3/2/2011	5/10/2011
ANALYTE/Lab ID				90451.13	10049.09	10234.03	10234.02	10382.04	1051506	1107604.00	1119908.00
Metals (µg/L)											
Aluminum	200	NLE	121000	ND	323	20.5 ER	ND	535	<13	<200	<200
Antimony	6	6	20.70	ND	ND	5.87 ER	6.7 ER	14.3	<4.7	<6.0	<6.0
Arsenic	3	10	89.30	2.27 ER	1.85 ER	ND	ND	1.92 ER	1.49 ER	<3.0	6.1
Barium	6000	2000	699.00	27.1	23.1	27.1	24.9	38.3	50.4	<200	<200
Beryllium	1	4	2.10	ND	0.163 ER	ND	ND	0.105 ER	<0.4	<1.0	<1.0
Cadmium	4	5	9.50	ND	0.856 ER	ND	ND	0.808 ER	1.03 ER	<3.0	<3.0
Calcium	NLE	NLE	45400.00	25000	12100	34100	31600	37300	49600	29200	28400
Chromium	70	100	191.00	ND	1.74 ER	ND	ND	3.05 ER	0.683 ER	<10	<10
Cobalt	NLE	NLE	18.30	ND	ND	ND	ND	ND	<0.3	<50	<50
Copper	1300	1300	65.60	ND	ND	ND	ND	1.7 ER	<0.8	<10	10.6
Iron	300	NLE	431000	8920	7950	4730	4310	6050	15500	22400	29600
Lead	5	15	22.70	ND	ND	ND	ND	2.8 ER	2.52 ER	<3.0	<3.0
Magnesium	NLE	NLE	62700	2630	1400	3750	3490	3940	5040	5530	5090
Manganese	50	NLE	331	52.4	24.9	38.3	35.7	36.6	92.9	156	331
Mercury	2	2	0.26	ND	ND	ND	ND	ND	<0.254	<0.2	<0.2
Nickel	100	NLE	187	1.01 ER	2.99 ER	ND	ND	ND	1.02 ER	<10	<10
Potassium	NLE	NLE	137000	3730	2320	5270	4860	5530	6900	<10000	<10000
Selenium	40	50	29.60	ND	ND	NR	NR	ND	<1.36	<10	<10
Silver	40	NLE	ND	ND	ND	ND	ND	0.551 ER	3.48 ER	<10	<10
Sodium	50000	NLE	21500	17700	10600	7250	50000	4140 ER	15100	19500	19100
Thallium	2	2	5.50	ND	ND	ND	ND	ND	<0.53	<2.0	<2.0
Vanadium	NLE	NLE	108	2.04	3.76 ER	ND	ND	2.76 ER	<0.5	<50	<50
Zinc	2000	NLE	233	3.15	31 ER	4.55 ER	ND	36.5 ER	3.12 ER	<20	27.6

Notes:

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Table 3
2013 Baseline Groundwater Analytical Detections
Site FTMM-12
Fort Monmouth, New Jersey

SAMPLE ID:			STANDARDS VALUES			FTMM-12-GW-M12MW11	FTMM-12-GW-M12MW12	FTMM-12-GW-M12MW13	FTMM-12-GW-M12MW14	FTMM-12-GW-M12MW15	FTMM-12-GW-M12MW16	FTMM-12-GW-M12MW17	FTMM-12-GW-M12MW18
DATE SAMPLED:			NJDEP GWQS[1]	USEPA MCL[2]	Weston 1995 Background (Main Post)	20-Aug-2013	21-Aug-2013	21-Aug-2013	21-Aug-2013	21-Aug-2013	23-Aug-2013	21-Aug-2013	21-Aug-2013
LAB SAMPLE ID:						R1306058-018	R1306112-012	R1306112-025	R1306112-005	R1306112-017	R1306198-012	R1306112-016	R1306112-001
SAMPLE INTERVAL (ft bgs):						5-20	5-20	5-20	5-20	5-20	4-14	4-14	4-14
	CAS No.	Unit											
Metals - SW6010C													
Lead	7439-92-1	µg/L	5	15 [3]	22.70	2.0 U	**1.6** J	2.0 U	2.0 U	**0.951** J	2.0 UJ	**2.0** J	2.0

QA NOTES AND DATA QUALIFIERS:

U - Analyte was not detected above the indicated limit of detection (LOD).
J - Analyte detected, estimated concentration.
UJ - Analyte not detected, reported LOD may be inaccurate or imprecise.
* - Field duplicate of sample on left.
D**etections are bolded.**
Detections above the NJDEP GWQS are highlighted.
For Detections above the USEPA MCL, the cell border is bolded.

NOTES:

[1] New Jersey Department of Environmental Protection Ground Water Quality Standards Specific Ground Water Quality Criteria - Class IIA and Practical Quantitation Levels.
(http://www.state.nj.us/dep/wms/bwqsa/Appendix_Table_1.htm).
[2] USEPA 2012 Edition of the Drinking Water Standards and Health Advisories, Spring 2012.
[3] Value is the USEPA Action Level.

Table 3
2013 Baseline Groundwater Analytical Detections
Site FTMM-12
Fort Monmouth, New Jersey

SAMPLE ID:				FTMM-12-GW-M12MW19		FTMM-12-GW-M12MW20		FTMM-12-GW-M12MW21		FTMM-12-GW-M12MW121*		FTMM-12-GW-M12MW22		FTMM-12-GW-M12MW23		FTMM-12-GW-M12MW24		FTMM-12-GW-M12MW25		FTMM-12-GW-M12MW26	
DATE SAMPLED:				20-Aug-2013		20-Aug-2013		20-Aug-2013		20-Aug-2013		22-Aug-2013		21-Aug-2013		21-Aug-2013		20-Aug-2013		20-Aug-2013	
LAB SAMPLE ID:				R1306058-028		R1306058-026		R1306058-006		R1306058-007		R1306152-001		R1306112-023		R1306112-015		R1306058-027		R1306058-008	
SAMPLE INTERVAL (ft bgs):				3-18		3-18		3-18		3-18		3-18		3-18		3-18		3-18		3-18	
	CAS No.	Unit																			
Metals - SW6010C																					
Lead	7439-92-1	µg/L	U	2.0	U	**1.7**	J	2.0	U	2.0	U	2.0	U	**2.2**	J	2.0	U	2.0	U	2.0	U

QA NOTES AND DATA QUALIFIERS:

U - Analyte was not detected above the indicated limit of detection (LOD).
J - Analyte detected, estimated concentration.
UJ - Analyte not detected, reported LOD may be inaccurate or imprecise.
* - Field duplicate of sample on left.
D**etections are bolded.**
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NOTES:

[1] New Jersey Department of Environmental Protection Ground Water Quality Standards Specific Ground Water Quality Criteria - Class IIA and Practical Quantitation Levels.
(http://www.state.nj.us/dep/wms/bwqsa/Appendix_Table_1.htm).
[2] USEPA 2012 Edition of the Drinking Water Standards and Health Advisories, Spring 2012.
[3] Value is the USEPA Action Level.

Attachment B
Figure 1 – FTMM-12 Location, and
Figure 2 – Layout of FTMM-12

Little Silver Borough

Shrewsbury Borough

Shrewsbury Borough

Parkers Creek

Parkers Creek

North Branch Parkers Creek

Oceanport Borough

Oceanport Creek

Tinton Falls Borough

Lafetra Creek

Husky Brook (Culvert)

Oceanport Borough

FTMM-12

Husky Brook Lake

Mill Creek

Wampum Lake

Oceanport Borough

Eatontown Borough

Eatontown Borough

Husky Brook

Turtle Mill Brook

West Long Branch Borough

LEGEND:

- Municipal Boundary
- FTMM-12 Landfill Revised Boundary (2015)
- Installation Boundary
- Surface Water Feature

N

1 inch = 1,000 feet

0 500 1,000 2,000 Feet

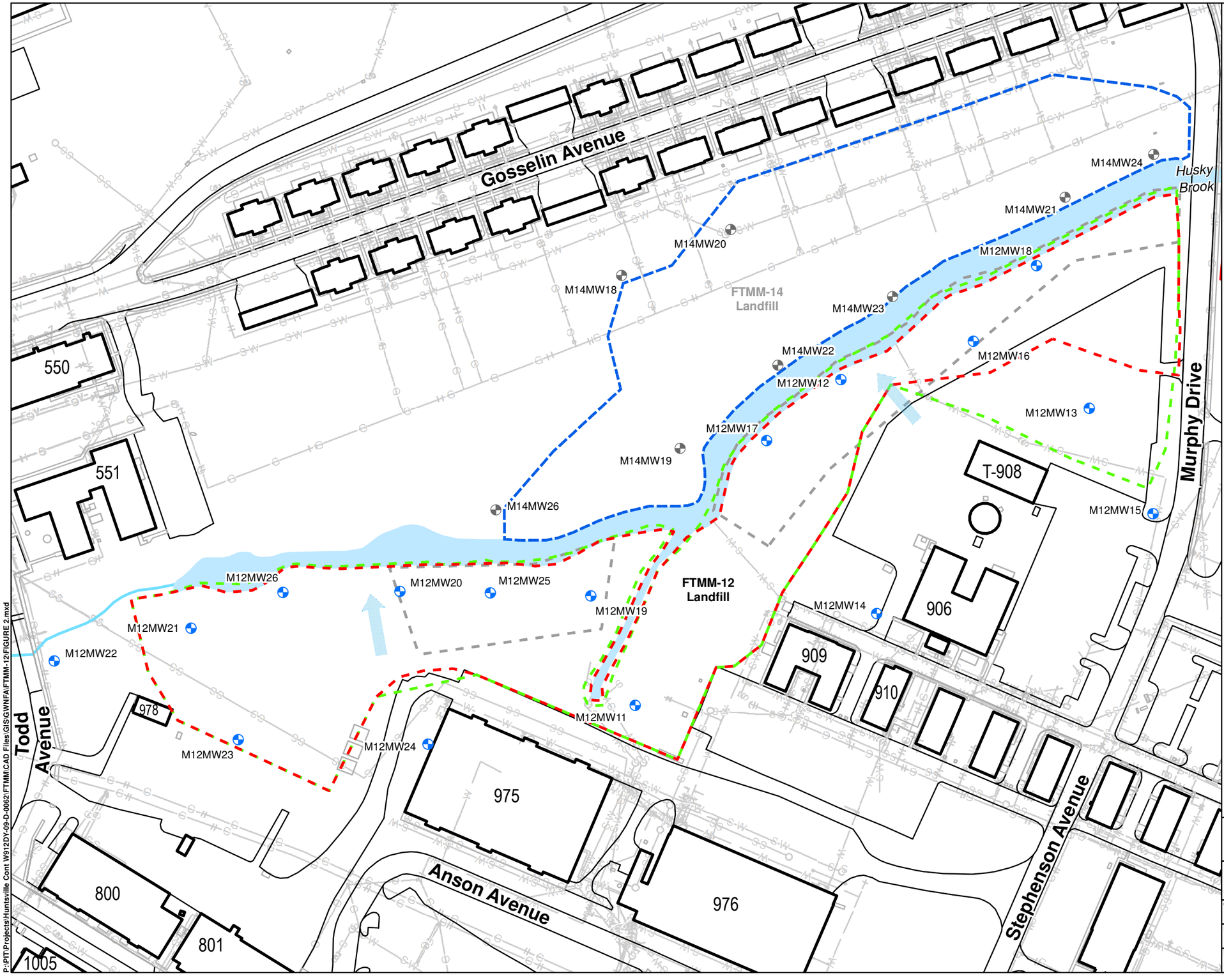
Source: FTMM Supplied CAD, 2013; ESRI Data and Maps, 2011; USGS NHD, 2012.

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

FTMM-12 LOCATION

CREATED BY: RR	REVIEWED BY: RF
DATE: FEB. 2017	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-03000	FILE: FIGURE 1.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\GWNFA\FTMM-12\FIGURE 1.mxd 2/9/2017 12:43:42 PM p0018397



LEGEND:

- Shallow Monitoring Well
- FTMM-14 Shallow Monitoring Well
- FTMM-12 Landfill Revised Boundary (2015)
- FTMM-12 Landfill Revised Boundary (2010)
- FTMM-12 Landfill Original Boundary
- FTMM-14 Landfill Revised Boundary (2015)
- Municipal Boundary
- Installation Boundary
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Estimated Groundwater Flow Direction

N

1 inch = 130 feet

0 65 130 260 Feet

Source: FTMM Supplied CAD, 2013.

PARSONS
401 Diamond Drive NW, Huntsville AL

Fort Monmouth New Jersey

LAYOUT OF FTMM-12

CREATED BY: RR	REVIEWED BY: JH
DATE: FEB. 2017	FIGURE NUMBER: FIGURE 2
PROJECT NUMBER: 748810-03000	FILE: FIGURE 2.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\GWNFA\FTMM-12\FIGURE 2.mxd