# ACTION MEMORANDUM FOR PARCEL 35, FORMER BUILDING 2560, TEST PIT SUST-D

# FORT MONMOUTH, OCEANPORT, MONMOUTH COUNTY, NEW JERSEY

**BRAC 05 Facility**
**Contract W912DY-09-D-0062**
**Task Order: 0012, Project No. 369857**

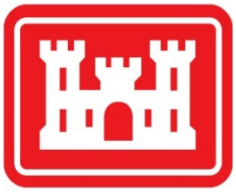
Submitted To:

**U.S. Army Corps of Engineers**

**New York District and**

**U.S. Army Engineering and Support Center**

**Huntsville, Alabama**



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**Revision No. 4**
**March 2018**

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# ACTION MEMORANDUM

## PARCEL 35, FORMER BUILDING 2560, TEST PIT SUST-D
## FORT MONMOUTH, NEW JERSEY

## APPROVAL

This Action Memorandum presents the selected removal action for contaminated soil at Parcel 35 (Former Building 2560, Test Pit SUST-D), located at Fort Monmouth in Oceanport, Monmouth County, New Jersey. The U.S. Army is the lead agency at Fort Monmouth under the Defense Environmental Restoration Program, 10 U.S.C. § 2701, and the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601 et seq. (CERCLA), and developed this Action Memorandum consistent with CERCLA, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. This memorandum will be incorporated into the Administrative Record file for Fort Monmouth, which is available for public review at the Eastern Branch of the Monmouth County Library, 1001 Route 35, Shrewsbury, New Jersey 07702. This document, presenting the results of a selected removal action with a present worth cost estimate of $11,000, is approved by the undersigned.

Thomas E. Lederle
Chief, BRAC Division
Department of the Army Assistant Chief of Staff Installation Management

9 MARCH 2018
Date

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# 1.0 STATEMENT OF BASIS AND PURPOSE

This Action Memorandum describes the selected time critical removal action (TCRA) performed at Parcel 35 (Former Building 2560, Test Pit SUST-D) in Fort Monmouth, New Jersey for the excavation and disposal of soil contaminated with polychlorinated biphenyls (PCBs). The purpose of this Action Memorandum is to document the U.S. Army's decision to undertake the TCRA.

This Action Memorandum was developed in accordance with: the Defense Environmental Restoration Program (DERP), 10 United States Code (U.S.C.) Section 2701; the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601 et seq. (CERCLA); and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Part 300 (USEPA 1991).

# 2.0 SITE CONDITIONS AND BACKGROUND

Parcel 35 (Former Building 2560, Test Pit SUST-D) is described in Section 2.1. Previous investigations are summarized in Section 2.2; investigative results are summarized in Section 2.3.

## 2.1 Site Setting and History

Fort Monmouth was established in 1917 as Camp Little Silver. The name of the Camp was changed shortly thereafter to Camp Alfred Vail. The initial mission of the Camp was to train Signal Corps operators for service in World War I. After the war, Camp Alfred Vail was designated as the site of the Signal Corps School. In 1925, the facility became a permanent post, and its name was changed to Fort Monmouth (FTMM). The primary mission of FTMM was to provide command, administrative, and logistical support for Headquarters, U.S. Army Fort Monmouth Communications and Electronics Command (CECOM) (Shaw, 2012). CECOM is a major subordinate command of the U.S. Army Materiel Command (AMC). FTMM was the center for the development of Fort Monmouth's Command and Control Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) systems, formerly the primary tenants of the Fort. FTMM has a long history of research and development (R&D) activity, mostly related to communications and electronic equipment. On 15 September 2011, FTMM was closed under the 2005 Base Realignment and Closure (BRAC) process.

Parcel 35 was originally described in the 2007 ECP report as a 59-acre area located in the central portion of the Charles Wood Area of FTMM. A suspected Underground Storage Tank (UST) was identified near Building 2560 on a 1948 gasoline and fuel storage drawing, and was labeled an "oil storage tank." Based on the map designation and real property records, this UST was a fuel oil tank used for heating Building 2560, a sewage treatment plant building that is no longer present (**Figure 1**).

An approximately 0.1 acre "carve-out" area was identified at the southeast corner of Corregidor Road and Guam Lane, and was designated as the "Parcel 35 Septic Tank at Pool Area." This carve-out area was subsequently closed out with the New Jersey Department of Environmental Protection (NJDEP) and did not require a TCRA, and therefore is not addressed further in this Action Memorandum.

## 2.2 Summary of Investigation Activities

The potential for discharges related to previous operations within ECP Parcel 35 was initially assessed in the BRAC Environmental Condition of Property (ECP) Report (U.S. Army BRAC, 2007), and no additional evaluation was recommended. NJDEP (2013) did not concur that there was no discharge at the suspected UST at former Building 2560 because no investigation had been performed in accordance with applicable NJDEP regulations and guidance documents.

Field investigation work at the suspected UST at former Building 2560 was completed in 2013, and included the collection of samples from four test pits (SUST-A through SUST-D) at the suspected UST site (**Figure 2**). The samples were analyzed for Target Compound List (TCL) analytes (including volatile organic compounds [VOCs] and semi-volatile organic compounds [SVOCs]) plus tentatively identified compounds (+ TICs), pesticides and PCBs, and metals (including hexavalent chromium). The samples were also analyzed for fractionated extractable petroleum hydrocarbons (EPH) and pH. Aroclor-1260 (a PCB) was detected at a concentration just above the NJDEP's Residential Direct Contact Soil Remediation Standard (RDCSRS) at sample location SUST-D.

## 2.3 Investigation Results

In July 2013, the Army analyzed soil and groundwater from 4 test pit locations designated as SUST-A through SUST-D in the areas of the suspected UST at former Building 2560. The results are presented in **Table 1 and Table 2**.

Fill with debris was observed and slightly elevated PCBs in soil were encountered at the SUST-D test pit. Concrete rubble and electrical conduit were observed at approximately 5 to 5.5 feet (ft) below ground surface (bgs) in this test pit, and PCBs were detected in soil (241 micrograms per kilogram [µg/kg]) slightly above the RDCSRS (200 µg/kg). PCBs were not detected in groundwater samples. The soil PCB exceedance was generally delineated towards the north, west, and south by the other test pit samples (SUST-A to SUST-C), and to the east by the physical boundary of former Building 2560 and the former wastewater plant. The elevated PCB detected in soil was likely associated with fill or debris rather than the suspected UST. Other soil and groundwater exceedances of comparison criteria by various inorganics as presented in **Tables 1 and 2** were satisfactorily resolved; related correspondence between the NJDEP and the Army is provided in **Appendix A**.

The TCRA was completed in May 2017 to remove soils with PCB concentrations that could pose a potential threat to human health and the environment. A 6 ft by 6 ft by 6ft deep volume of soil was unearthed, containerized, and sampled for waste disposal profiling. A post-excavation sample (BKG-35-001) was collected from the bottom of the excavation to document existing site conditions (**Figure 3**). The excavation was subsequently backfilled with crushed stone and covered with topsoil (**Appendix A**).

PCB analytical results for the post-excavation confirmation soil sample (BKG-35-001) are presented in **Table 3.** The sample was analyzed for PCBs and EPH. There were no exceedances of the RDCSRS for PCBs or EPH in the confirmation sample.

# 3.0 THREATS TO PUBLIC HEALTH, WELFARE, AND THE ENVIRONMENT

Soil concentrations of PCBs before and after soil removal were compared to U.S. Environmental Protection Agency (EPA) Residential Screening Levels (RSL) to evaluate the potential effects of PCBs on human health and the environment. The results of these comparisons were used to evaluate the need for soil removal and to identify the general effectiveness of the removal action performed in 2017.

## 3.1 Risk Assessment Evaluation

3.1.1 A screening evaluation was performed to evaluate the need for soil removal to reduce the threat to human health. **Table 4** presents the maximum detected concentration of PCBs (specifically Aroclor 1260). This maximum concentration exceeded the USEPA Residential RSL, indicating a potential threat to human health.

3.1.2 Following soil removal, Aroclor 1260 was not detected in the post-removal sample of the soil remaining in-place. Another screening evaluation was performed to evaluate risks to future receptors (e.g., residents, workers, recreational users) from exposure to PCBs (specifically Aroclor 1260) in soil via incidental ingestion, dermal contact, and inhalation. The conclusion of the post-excavation screening evaluation was that unacceptable risk to future receptors is not expected.

3.1.3 In summary, there was an exceedance of the USEPA RSL for Aroclor 1260 prior to soil removal that indicated a potential threat to human health. Following soil removal, the remaining concentrations were reduced to levels that no longer pose an unacceptable risk.

**Table 4. Maximum Aroclor 1260 Concentration in Soil Prior to and After the TCRA**

| Contaminant | Pre-Soil Removal Maximum Concentration (µg/kg) | Post-Soil Removal Maximum Concentration (µg/kg) | USEPA RSL[1] (µg/kg) |
|---|---|---|---|
| Aroclor 1260 | 241 | ND | 240 |

1. USEPA RSLs for Residential Soil, based on target risk of 1E-06 and target hazard quotient of 0.1. Effective June 2017 (USEPA, 2017).

ND – not detected, at a reporting limit of 30 µg/kg

3.1.4 The Baseline Ecological Evaluation (BEE; Shaw, 2012) concluded that constituents at the Charles Wood Area of FTMM (including the area around Parcel 35) were unlikely to have a deleterious effect on sensitive ecological receptors or habitats, and additional ecological assessments were not warranted or recommended.

# 4.0 REGULATORY FRAMEWORK AND ENDANGERMENT DETERMINATION

This section summarizes the regulatory framework for the TCRA at Parcel 35 and presents the objectives of the removal action.

## 4.1 Regulatory Framework

CERCLA provides the President authority to respond to releases of hazardous substances, including removal actions (42 U.S.C. Section 9604(a)). Executive Order 12580 Section 2(d) delegates the President's authority under various CERCLA sections, including Section 9604(a), to the Secretary of the U.S. Department of Defense (DoD). Section 300.415 of the NCP further specifies the structure and requirements for removal actions. As the lead agency, the U.S. Army has chosen the proposed action in this TCRA for Parcel 35 in accordance with CERCLA and the NCP. The NJDEP acts as the state support agency.

### 4.1.1 Justification of the Time Critical Removal Action

A removal action is warranted pursuant to the NCP when the lead agency makes the determination considering several factors that there is a threat to public health or welfare or the environment (40 CFR 300.415(b)(1)). Of the listed factors in the NCP, the following two factors in Section 300.415(b)(2) of the NCP (40 CFR 300.415) were directly applicable to the site and were used in determining the appropriateness of a TCRA in reference to the contaminant concentrations in soil near Parcel 35:

*Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants, or contaminants.* (40 CFR 300.415(b)(2)(i)).

Aroclor 1260 was present in soil at Parcel 35 at concentrations that could pose a threat to human health (**Table 4**). The NCP also states:

*If the lead agency determines that a removal action is appropriate, actions shall, as appropriate, begin as soon as possible to abate, prevent, minimize, stabilize, mitigate, or eliminate the threat to public health or welfare of the United States or the environment.* (40 CFR 300.415(b)(3))

The U.S. Army determined that a TCRA was appropriate for Parcel 35 to remove the source of Aroclor 1260 contamination in soil.

### 4.1.2 Applicable or Relevant and Appropriate Requirements

The TCRA described in this Action Memorandum complied with ARARs. In accordance with the NCP (40 CFR 300.415(i)), onsite removal actions conducted under CERCLA are required to meet applicable or relevant and appropriate requirements (ARARs) "to the extent practicable." The New Jersey (NJ) RDCSRSs were applicable to this TCRA. The applicable NJ RDCSRS, which was reviewed by and coordinated with NJDEP, for Aroclor 1260 is 200 µg/kg.

The U.S. Army also complied with applicable requirements for offsite actions (i.e., Resource Conservation and Recovery Act [RCRA] hazardous waste transportation and offsite treatment requirements prior to land disposal as required by the RCRA land disposal restrictions).

## 4.2 Endangerment Determination

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Action Memorandum, may have resulted in unacceptable exposures to contaminants and presented a threat to human health.

## 4.3 Removal Action Objectives

The removal action objective (RAO) for Parcel 35 was to remove PCB concentrations in soil that posed a threat to human health.

# 5.0 DESCRIPTION OF SELECTED ACTION

Two alternatives for Parcel 35 were evaluated using the effectiveness, implementability, and cost selection criteria established by the NCP. The relative performances of the alternatives were subsequently evaluated in a comparative analysis.

The alternatives considered for Parcel 35 were:

- Alternative 1 – No Action
- Alternative 2 – Soil Removal and Offsite Disposal.

Both alternatives were evaluated against CERCLA remedial criteria of effectiveness, implementability, and cost. Only Alternative 2 satisfied the threshold criteria of protecting human health and the environment and complied with ARARs and was effective and implementable; therefore, it was then assessed for cost. Based on the comparative analysis in terms of effectiveness, implementability, and cost, the U.S. Army's selected alternative was **Alternative 2 – Soil Removal and Offsite Disposal.** Protectiveness is achieved by the removal of contamination in subsurface soil and is more cost effective in the long term compared to institutional controls.

The selected removal action for the TCRA at Parcel 35 consisted of removing the contamination (Aroclor 1260) in subsurface soil. Removal action activities included site preparation, removal of contaminated soil, offsite transportation and disposal, and site restoration.

Site preparation included staking the excavation locations and identifying locations of utilities. Contaminated soil was removed and placed in roll-off boxes. Clean backfill was compacted in lifts and graded to maintain positive drainage. The excavation area was restored with grass seed and straw over the areas impacted during the removal action. Characterization, transportation, and offsite disposal of solid or hazardous waste complied with all appropriate Federal and state laws.

The general criteria for evaluating removal actions include effectiveness, implementability, and cost. The ability of the proposed action to meet these criteria is described below.

NJDEP has concurred with the Army's determination that no further action is necessary following the TCRA performed at Parcel 35. Since hazardous substances will not remain at the site above an unrestricted use/unlimited exposure scenario, statutory 5-Year Reviews will not be necessary.

## 5.1 Effectiveness

The removal action for Parcel 35 has been effective at providing short- and long-term protection. This action is permanent because the source of the soil contamination has been removed. This alternative complies with ARARs as discussed in Section 4.1.2. The chemical concentrations in the soil at the site did not present an unacceptable risk to site workers during the removal action. Physical risks were addressed by implementing approved health and safety practices during the removal action.

## 5.2 Implementability

The removal action has been demonstrated to be both technically and administratively implementable. Soil excavation employed construction practices that are routinely implemented. All services and materials required were readily available. This alternative has achieved the RAO through soil removal and offsite disposal.

### 5.3 Cost

The cost of the TCRA at Parcel 35 was $11,000. A breakdown of the costs is provided in **Table 5**. The costs include development of project-specific work plans, site preparation, soil excavation, transportation and disposal, site restoration, and reporting.

**Table 5. Estimated Costs for Parcel 35 Alternative 2: Soil Removal and Offsite Disposal**

| Phase Name | Year 1 |
|---|---|
| Work Plan | $1,500 |
| Excavate and Remove Soil; Backfill | $5,000 |
| Transportation and Disposal | $1,500 |
| Waste Characterization | $1,000 |
| Professional Labor | $2,000 |
| Present Worth Total Cost: | $11,000 |

## 6.0 EXPECTED CHANGE IN THE SITUATION HAD THE ACTION BEEN DELAYED OR NOT TAKEN

Delaying the implementation of the proposed removal action or taking no action would have resulted in potential threats to human health and the environment as well as delays in the transfer of Parcel 35 from the U.S. Army to the Fort Monmouth Economic Revitalization Authority (FMERA).

## 7.0 PUBLIC INVOLVEMENT AND PARTICIPATION

This Action Memorandum will be made available for a 30-day public review and comment period from 27 March to 26 April 2018.

The TCRA will be posted on the Fort Monmouth IRP website (http://www.pica.army.mil/ftmonmouth/) and placed in the Fort Monmouth Environmental Restoration Public Information Repository (the Administrative Record) at the following location:

Monmouth County Library, Eastern Branch
1001 Route 35, Shrewsbury, NJ
Phone: (732) 683-8980
Hours: Mon-Thurs, 9am-9pm; Fri-Sat, 9am-5pm; and Sun, 1pm-5pm

**Appendix B** includes the public press release regarding the TCRA and the public notice requesting comments.

## 8.0 RECOMMENDATIONS

This Action Memorandum documents the action taken by the U.S. Army for the removal of contaminated soil at Parcel 35 at Fort Monmouth, New Jersey. The removal action was developed in accordance with CERCLA as amended and in a manner consistent with the NCP. This Action Memorandum provides

information related to the selection of the remedy and identifies actions taken to address the potential risks to human health and the environment.

The soil removal and backfill alternative selected as the final remedy consisted of the removal of the source of contamination in soil at Parcel 35. This remedy best met the RAO and NCP criteria because it:

- Was technically feasible based on commonly used construction techniques and demonstrated proven approaches;
- Was administratively feasible and eliminated requirements to conduct CERCLA 5-Year Reviews;
- Provided a high degree of long-term public health and environmental protection through the removal of the source of the contaminated soil;
- Complied with chemical- and action-specific ARARs;
- Imposed no restrictions on future use of the site;
- Facilitated transfer of the property to the FMERA
- Served as a final action at the site.

The removal action meets the evaluation criteria of effectiveness, implementability, and cost.

## 9.0 REFERENCES

NJDEP, 2013. Letter to Calibre Systems; Re: *Draft Finding of Suitability to Transfer (FOST) dated March 2013, Charles Wood Area.* April 29.

Shaw, 2012. *Final Fort Monmouth Main Post and Charles Wood Area Baseline Ecological Evaluation Report, U.S. Army Garrison Fort Monmouth, Fort Monmouth, New Jersey.* Prepared for the Army Corps of Engineers, Baltimore District. Rev. 1.

United States (US) Army Base Realignment and Closure (BRAC), 2007. *Environmental Condition of Property Report – Fort Monmouth, Monmouth County, New Jersey.* Final. January 29.

USEPA, 2017. Regional Screening Levels Summary Table (based on target risk of 1E-06 and target hazard quotient of 0.1). June. Available at: https://semspub.epa.gov/work/03/2245071.pdf.

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# Figure 1

## Charles Wood Layout Showing Suspected UST at Former Building 2560

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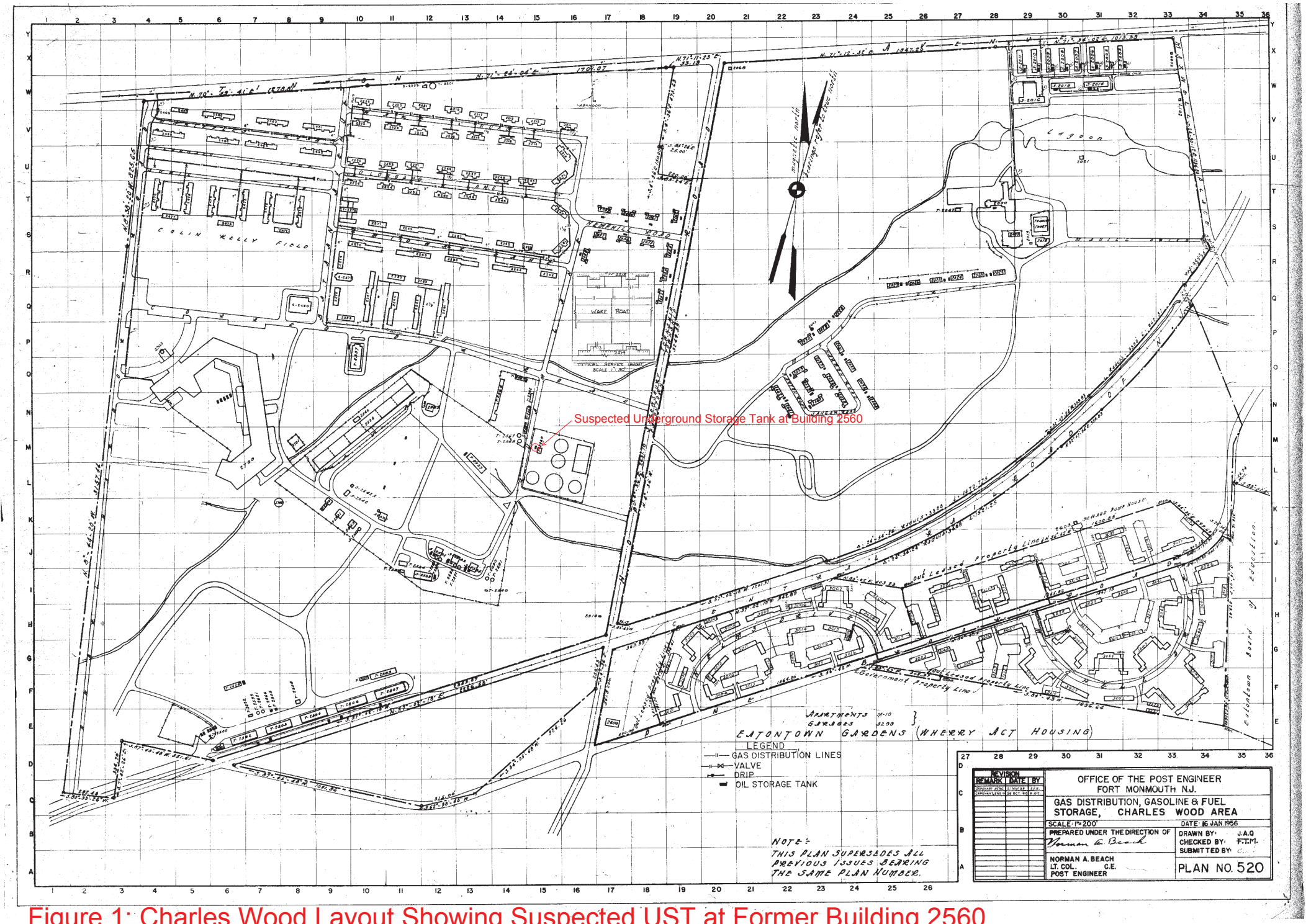


Figure 1: Charles Wood Layout Showing Suspected UST at Former Building 2560

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# Figure 2

# Corregidor-Guam Area Test Pit Location Map

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Figure 2 Corregidor-Guam Area Test Pit Location Map

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# Figure 3

# Parcel 35 Soil Results

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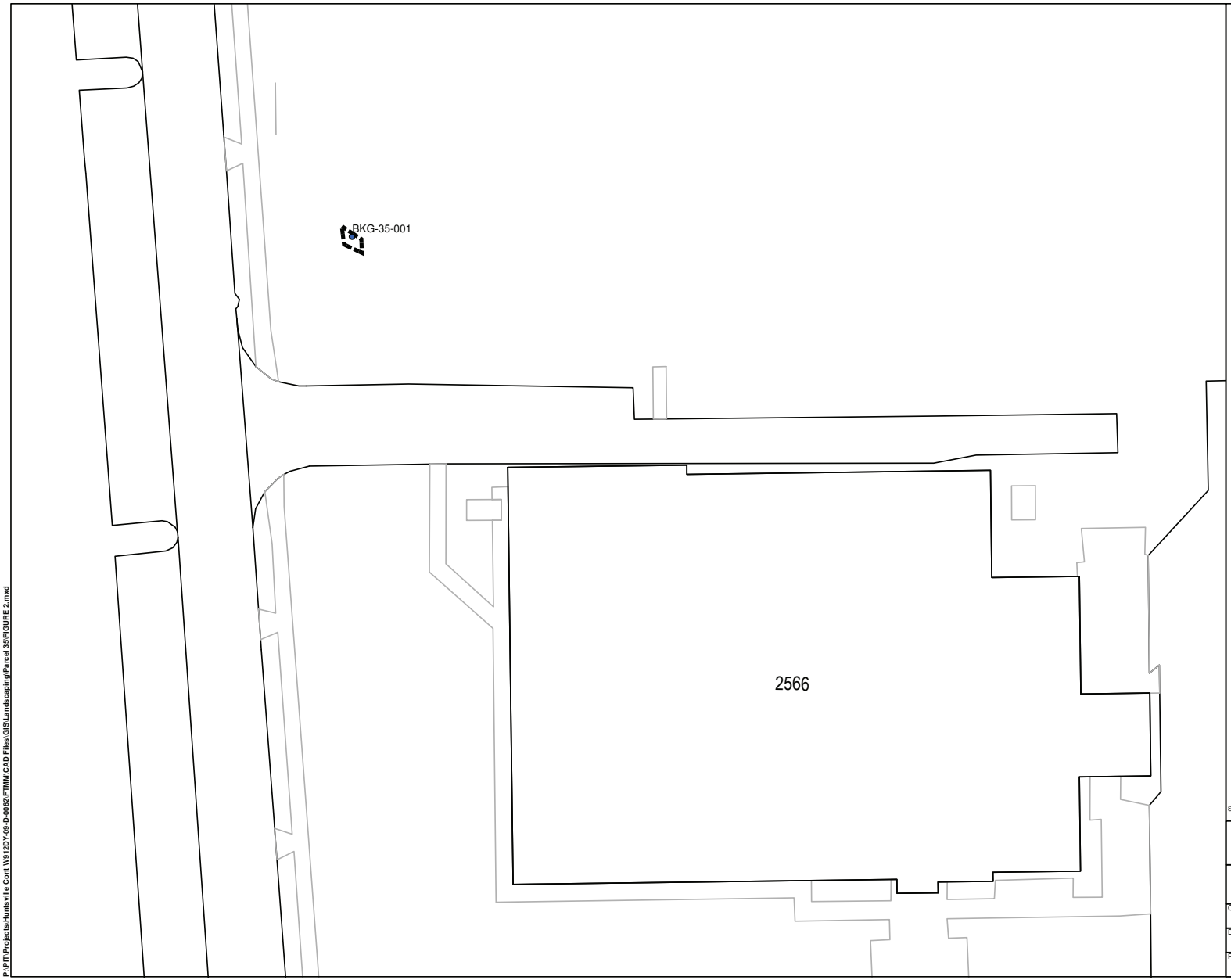


**LEGEND:**

- Background Sample
- Surface Water Feature
- Surface Water Flow Direction
- Extent of Excavated Soil

**NOTES:**

Locations derived from GPS locations and photographs of 2013 test pit activities.

N

1 inch = 30 feet

0 15 30 60 Feet

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

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

**PARCEL 35 SOIL RESULTS**

| CREATED BY: | REVIEWED BY: |
|---|---|
| RR | KF |
| DATE: | FIGURE NUMBER: |
| JUN. 2017 | FIGURE 3 |
| PROJECT NUMBER: | FILE: |
| 748810-06013 | FIGURE 3.mxd |

P:\PIT Projects\Huntsville Cont W912DY-09-D-0002\FTMM CAD Files\GIS\Landscaping\Parcel 35\FIGURE 2.mxd

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# Table 1

## Detected Soil Sampling Results Comparison to New Jersey Action Levels, Parcel 35, Fort Monmouth, New Jersey

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Table 1: Detected Soil Sampling Results Comparison to New Jersey
Action Levels Parcel 35 Fort Monmouth, New Jersey

| Loc ID | NJ Residential Direct Contact SRS | SUST-A | SUST-B | SUST-C | SUST-D |
|---|---|---|---|---|---|
| Sample ID | | SUST-A 5.0-5.5 | SUST-B 5.0-5.5 | SUST-C 5.0-5.5 | SUST-D 5.0-5.5 |
| Sample Date | | 7/9/2013 | 7/9/2013 | 7/12/2013 | 7/12/2013 |
| **Volatile Organic Compounds (µg/kg)** | | | | | |
| 1,1,1-Trichloroethane | 290,000 | < 0.11 | < 0.14 | < 6.5 | < 0.1 |
| 1,1,2,2-Tetrachloroethane | 1,000 | < 0.14 | < 0.18 | < 8.1 | < 0.13 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | NLE | < 0.46 | < 0.58 | < 26 | < 0.42 |
| 1,1,2-Trichloroethane | 2,000 | < 0.19 | < 0.23 | < 11 | < 0.17 |
| 1,1-Dichloroethane | 8,000 | < 0.15 | < 0.18 | < 8.4 | < 0.13 |
| 1,1-Dichloroethene | 11,000 | < 0.28 | < 0.35 | < 16 | < 0.25 |
| 1,2,3-Trichlorobenzene | NLE | < 0.18 | < 0.22 | < 10 | < 0.16 |
| 1,2,4-Trichlorobenzene | 73,000 | < 0.15 | < 0.19 | < 8.5 | < 0.13 |
| 1,2-Dibromo-3-chloropropane | 80 | < 0.96 | < 1.2 | < 54 | < 0.86 |
| 1,2-Dibromoethane | 8 | < 0.14 | < 0.17 | < 7.8 | < 0.12 |
| 1,2-Dichlorobenzene | 5,300,000 | < 0.2 | < 0.26 | < 12 | < 0.18 |
| 1,2-Dichloroethane | 900 | < 0.15 | < 0.18 | < 8.3 | < 0.13 |
| 1,2-Dichloropropane | 2,000 | < 0.17 | < 0.21 | < 9.4 | < 0.15 |
| 1,3-Dichlorobenzene | 5,300,000 | < 0.2 | < 0.25 | < 11 | < 0.18 |
| 1,4-Dichlorobenzene | 5,000 | < 0.19 | < 0.24 | < 11 | < 0.17 |
| 1,4-Dioxane | NLE | < 64 | < 80 | < 3600 | < 58 |
| Acetone | 70,000,000 | < 1.8 | < 2.3 | < 100 | **81.3** |
| Benzene | 2,000 | < 0.13 | < 0.16 | < 7.3 | < 0.12 |
| Bromochloromethane | NLE | < 0.29 | < 0.36 | < 16 | < 0.26 |
| Bromodichloromethane | 1,000 | < 0.11 | < 0.14 | < 6.4 | < 0.1 |
| Bromoform | 81,000 | < 0.16 | < 0.2 | < 9.2 | < 0.15 |
| Carbon disulfide | 7,800,000 | < 0.13 | < 0.16 | < 7.2 | **0.53 J** |
| Carbon tetrachloride | 600 | < 0.14 | < 0.18 | < 8.1 | < 0.13 |
| Chlorobenzene | 510,000 | < 0.12 | < 0.15 | < 6.6 | < 0.1 |
| Chlorodibromomethane | 3,000 | < 0.18 | < 0.22 | < 10 | < 0.16 |
| Chloroethane | 220,000 | < 0.24 | < 0.31 | < 14 | < 0.22 |
| Chloroform | 600 | < 0.089 | < 0.11 | < 5.1 | < 0.08 |
| Cis-1,2-Dichloroethene | 230,000 | < 0.2 | < 0.25 | < 11 | < 0.18 |
| Cis-1,3-Dichloropropene | NLE | < 0.15 | < 0.19 | < 8.5 | < 0.13 |
| Cyclohexane | NLE | < 0.13 | < 0.17 | < 7.6 | < 0.12 |
| Dichlorodifluoromethane | 490,000 | < 0.25 | < 0.31 | < 14 | < 0.22 |
| Ethyl benzene | 7,800,000 | < 0.28 | < 0.35 | < 16 | < 0.26 |
| Isopropylbenzene | NLE | < 0.08 | < 0.1 | **28.7 J** | < 0.072 |

| Loc ID | NJ Residential Direct Contact SRS | SUST-A | SUST-B | SUST-C | SUST-D |
|---|---|---|---|---|---|
| Sample ID | | SUST-A 5.0-5.5 | SUST-B 5.0-5.5 | SUST-C 5.0-5.5 | SUST-D 5.0-5.5 |
| Sample Date | | 7/9/2013 | 7/9/2013 | 7/12/2013 | 7/12/2013 |
| Meta/Para Xylene | NLE | < 0.19 | < 0.23 | < 11 | < 0.17 |
| Methyl Acetate | 78,000,000 | < 2.8 | < 3.5 | < 160 | < 2.5 |
| Methyl bromide | 25,000 | < 0.29 | < 0.37 | < 17 | < 0.26 |
| Methyl butyl ketone | NLE | < 0.67 | < 0.84 | < 38 | < 0.6 |
| Methyl chloride | 4,000 | < 0.2 | < 0.25 | < 11 | < 0.18 |
| Methyl cyclohexane | NLE | < 0.18 | < 0.23 | < 10 | < 0.16 |
| Methyl ethyl ketone | 3,100,000 | < 2.6 | < 3.2 | < 150 | **10.3** |
| Methyl isobutyl ketone | NLE | < 0.81 | < 1 | < 46 | < 0.73 |
| Methyl Tertbutyl Ether | 110,000 | < 0.25 | < 0.32 | < 14 | < 0.23 |
| Methylene chloride | 34,000 | **3.3 JB** | **4.8 JB** | < 78 | **2.9 J** |
| Ortho Xylene | NLE | < 0.15 | < 0.19 | < 8.5 | < 0.13 |
| Styrene | 90,000 | < 0.099 | < 0.12 | < 5.6 | < 0.089 |
| Tetrachloroethene | 2,000 | < 0.19 | < 0.23 | < 11 | < 0.17 |
| Toluene | 6,300,000 | **0.27 J** | **0.36 J** | **136** | **0.26 J** |
| Total Xylenes | 12,000,000 | < 0.15 | < 0.19 | < 8.5 | < 0.13 |
| Trans-1,2-Dichloroethene | 300,000 | < 0.26 | < 0.32 | < 15 | < 0.23 |
| Trans-1,3-Dichloropropene | NLE | < 0.17 | < 0.21 | < 9.5 | < 0.15 |
| Trichloroethene | 7,000 | < 0.19 | < 0.23 | < 11 | < 0.17 |
| Trichlorofluoromethane | 23,000,000 | < 0.32 | < 0.4 | < 18 | < 0.29 |
| Vinyl chloride | 700 | < 0.16 | < 0.19 | < 8.8 | < 0.14 |
| **Semivolatile Organic Compounds (µg/kg)** | | | | | |
| 1,1'-Biphenyl | 3,100,000 | < 4.2 | < 3.8 | < 4.3 | < 4.1 |
| 1,2,4,5-Tetrachlorobenzene | NLE | < 11 | < 10 | < 11 | < 11 |
| 2,3,4,6-Tetrachlorophenol | NLE | < 38 | < 34 | < 38 | < 36 |
| 2,4,5-Trichlorophenol | 6,100,000 | < 42 | < 38 | < 43 | < 41 |
| 2,4,6-Trichlorophenol | 19,000 | < 34 | < 31 | < 35 | < 33 |
| 2,4-Dichlorophenol | 180,000 | < 59 | < 53 | < 59 | < 57 |
| 2,4-Dimethylphenol | 1,200,000 | < 61 | < 56 | < 62 | < 59 |
| 2,4-Dinitrophenol | 120,000 | < 44 | < 40 | < 45 | < 43 |
| 2,4-Dinitrotoluene | 700 | < 16 | < 14 | < 16 | < 15 |
| 2,6-Dinitrotoluene | 700 | < 14 | < 13 | < 14 | < 13 |
| 2-Chloronaphthalene | NLE | < 11 | < 10 | < 11 | < 11 |
| 2-Chlorophenol | 310,000 | < 37 | < 33 | < 37 | < 36 |
| 2-Methylnaphthalene | 230,000 | < 20 | < 18 | < 21 | < 20 |
| 2-Methylphenol | 310,000 | < 42 | < 38 | < 42 | < 40 |
| 2-Nitroaniline | 39,000 | < 16 | < 15 | < 16 | < 15 |
| 2-Nitrophenol | NLE | < 39 | < 35 | < 39 | < 37 |
| 3&4-Methylphenol | NLE | < 46 | < 42 | < 47 | < 45 |
| 3,3'-Dichlorobenzidine | 1,000 | < 9.3 | < 8.4 | < 9.4 | < 8.9 |
| 3-Nitroaniline | NLE | < 15 | < 13 | < 15 | < 14 |
| 4,6-Dinitro-2-methylphenol | 6,000 | < 44 | < 40 | < 45 | < 43 |

| Loc ID | NJ Residential Direct Contact SRS | SUST-A | SUST-B | SUST-C | SUST-D |
|---|---|---|---|---|---|
| Sample ID | | SUST-A 5.0-5.5 | SUST-B 5.0-5.5 | SUST-C 5.0-5.5 | SUST-D 5.0-5.5 |
| Sample Date | | 7/9/2013 | 7/9/2013 | 7/12/2013 | 7/12/2013 |
| 4-Bromophenyl phenyl ether | NLE | < 13 | < 12 | < 13 | < 13 |
| 4-Chloro-3-methylphenol | NLE | < 36 | < 33 | < 37 | < 35 |
| 4-Chloroaniline | NLE | < 12 | < 11 | < 12 | < 11 |
| 4-Chlorophenyl phenyl ether | NLE | < 11 | < 10 | < 11 | < 11 |
| 4-Nitroaniline | NLE | < 14 | < 13 | < 14 | < 14 |
| 4-Nitrophenol | NLE | < 62 | < 56 | < 62 | < 59 |
| Acenaphthene | 3,400,000 | < 11 | < 9.6 | **3,210** | < 10 |
| Acenaphthylene | NLE | < 12 | < 11 | < 12 | < 11 |
| Acetophenone | 2,000 | < 6.4 | < 5.8 | < 6.5 | < 6.2 |
| Anthracene | 17,000,000 | < 13 | < 12 | < 13 | < 12 |
| Atrazine | 210,000 | < 7.2 | < 6.5 | < 7.3 | < 6.9 |
| Benzaldehyde | 6,100,000 | < 8.4 | < 7.6 | < 8.5 | < 8.1 |
| Benzo(a)anthracene | 600 | < 12 | < 11 | < 12 | **25.5 J** |
| Benzo(a)pyrene | 200 | < 11 | < 10 | **41.2** | **23 J** |
| Benzo(b)fluoranthene | 600 | < 12 | < 11 | **51.4** | **28 J** |
| Benzo(ghi)perylene | 380,000,000 | < 14 | < 12 | **31.6 J** | **24.4 J** |
| Benzo(k)fluoranthene | 6,000 | < 14 | < 12 | **15.7 J** | < 13 |
| Bis(2-Chloroethoxy)methane | NLE | < 15 | < 13 | < 15 | < 14 |
| Bis(2-Chloroethyl)ether | 400 | < 11 | < 10 | < 11 | < 11 |
| Bis(2-Chloroisopropyl)ether | 23,000 | < 11 | < 9.8 | < 11 | < 10 |
| Bis(2-Ethylhexyl)phthalate | 35,000 | < 32 | < 29 | < 33 | < 31 |
| Butyl benzyl phthalate | 1,200,000 | < 21 | < 19 | < 21 | < 20 |
| Caprolactam | 31,000,000 | < 11 | < 10 | < 12 | < 11 |
| Carbazole | 24,000 | < 17 | < 15 | < 17 | < 16 |
| Chrysene | 62,000 | < 12 | < 11 | < 12 | **32.1 J** |
| Dibenz(a,h)anthracene | 200 | < 12 | < 11 | < 13 | < 12 |
| Dibenzofuran | NLE | < 11 | < 9.8 | < 11 | < 10 |
| Diethyl phthalate | 49,000,000 | < 12 | < 11 | < 13 | < 12 |
| Dimethyl phthalate | NLE | < 13 | < 12 | < 13 | < 12 |
| Di-n-butylphthalate | 6,100,000 | < 8.1 | < 7.4 | < 8.2 | < 7.8 |
| Di-n-octylphthalate | 2,400,000 | < 18 | < 16 | < 18 | < 17 |
| Fluoranthene | 2,300,000 | < 16 | < 15 | **419** | **56.4** |
| Fluorene | 2,300,000 | < 12 | < 11 | **4,940** | < 12 |
| Hexachlorobenzene | 300 | < 12 | < 11 | < 12 | < 11 |
| Hexachlorobutadiene | 6,000 | < 10 | < 9.2 | < 10 | < 9.8 |
| Hexachlorocyclopentadiene | 45,000 | < 37 | < 34 | < 38 | < 36 |
| Hexachloroethane | 35,000 | < 10 | < 9.2 | < 10 | < 9.8 |
| Indeno(1,2,3-cd)pyrene | 600 | < 13 | < 12 | **25.4 J** | **17 J** |
| Isophorone | 510,000 | < 9.8 | < 8.9 | < 9.9 | < 9.5 |
| Naphthalene | 6,000 | < 10 | < 9.1 | < 10 | < 9.6 |
| Nitrobenzene | 31,000 | < 11 | < 9.6 | < 11 | < 10 |

| Loc ID | NJ Residential Direct Contact SRS | SUST-A | SUST-B | SUST-C | SUST-D |
|---|---|---|---|---|---|
| Sample ID | | SUST-A 5.0-5.5 | SUST-B 5.0-5.5 | SUST-C 5.0-5.5 | SUST-D 5.0-5.5 |
| Sample Date | | 7/9/2013 | 7/9/2013 | 7/12/2013 | 7/12/2013 |
| N-Nitroso-di-n-propylamine | 200 | < 8.9 | < 8.1 | < 9 | < 8.6 |
| N-Nitrosodiphenylamine | 99,000 | < 22 | < 20 | < 22 | < 21 |
| Pentachlorophenol | 3,000 | < 62 | < 57 | < 63 | < 60 |
| Phenanthrene | NLE | < 17 | < 15 | **11,300** | **44.2** |
| Phenol | 18,000,000 | < 38 | < 35 | < 39 | < 37 |
| Pyrene | 1,700,000 | < 14 | < 13 | **1,020** | **52.1** |
| **Extractable/Volatile Petroleum Hydrocarbons (mg/kg)** | | | | | |
| C10-C12 Aromatics | NLE | < 0.16 | < 0.17 | **45.6** | < 0.18 |
| C12-C16 Aliphatics | NLE | < 0.23 | < 0.25 | **1,700** | < 0.26 |
| C12-C16 Aromatics | NLE | < 0.23 | < 0.25 | **273** | < 0.26 |
| C16-C21 Aliphatics | NLE | < 0.21 | < 0.22 | **1,120** | < 0.23 |
| C16-C21 Aromatics | NLE | < 0.34 | < 0.36 | **862** | < 0.38 |
| C21-C36 Aromatics | NLE | < 0.55 | < 0.58 | **131** | < 0.61 |
| C21-C40 Aliphatics | NLE | < 0.6 | < 0.64 | **260** | < 0.67 |
| C9-C12 Aliphatics | NLE | < 0.15 | < 0.16 | **445** | < 0.17 |
| Total Aliphatics | NLE | < 0.15 | < 0.16 | **3,520** | < 0.17 |
| Total Aromatics | NLE | < 0.16 | < 0.17 | **1,310** | < 0.18 |
| Total EPH | SS | < 0.15 | < 0.16 | **4,830** | < 0.17 |
| **Pesticides (µg/kg)** | | | | | |
| 4,4'-DDD | 3,000 | < 0.38 | < 0.39 | **10.5** | **196** |
| 4,4'-DDE | 2,000 | **0.99** | < 0.29 | **17.7** | **138** |
| 4,4'-DDT | 2,000 | **0.83** | < 0.35 | **4.7** | **158** |
| Aldrin | 40 | < 0.32 | < 0.33 | < 0.34 | < 0.34 |
| Alpha-BHC | 100 | < 0.21 | < 0.21 | < 0.22 | < 0.22 |
| Alpha-Chlordane | NLE | < 0.26 | < 0.26 | < 0.27 | **2.2** |
| Beta-BHC | 400 | < 0.44 | < 0.44 | < 0.46 | < 0.46 |
| Delta-BHC | NLE | < 0.35 | < 0.35 | < 0.36 | < 0.37 |
| Dieldrin | 40 | < 0.27 | < 0.28 | < 0.29 | < 0.29 |
| Endosulfan I | NLE | < 0.27 | < 0.27 | < 0.28 | < 0.28 |
| Endosulfan II | NLE | < 0.42 | < 0.43 | < 0.44 | < 0.45 |
| Endosulfan sulfate | 470,000 | < 0.3 | < 0.31 | < 0.32 | < 0.32 |
| Endrin | 23,000 | < 0.23 | < 0.23 | < 0.24 | < 0.24 |
| Endrin aldehyde | NLE | < 0.37 | < 0.37 | < 0.39 | < 0.39 |
| Endrin ketone | NLE | < 0.29 | < 0.29 | < 0.3 | < 0.3 |
| Gamma-BHC/Lindane | 400 | < 0.34 | < 0.35 | < 0.36 | < 0.37 |
| Gamma-Chlordane | 200 | < 0.48 | < 0.49 | < 0.51 | **2.5** |
| Heptachlor | 100 | < 0.34 | < 0.35 | < 0.36 | < 0.36 |
| Heptachlor epoxide | 70 | < 0.26 | < 0.27 | < 0.28 | **3.9** |
| Methoxychlor | 390,000 | < 0.69 | < 0.7 | < 0.72 | < 0.73 |
| Toxaphene | 600 | < 8.8 | < 9 | < 9.3 | < 9.4 |
| **PCBs (µg/kg)** | | | | | |

| Loc ID | NJ Residential Direct Contact SRS | SUST-A | SUST-B | SUST-C | SUST-D |
|---|---|---|---|---|---|
| Sample ID | | SUST-A 5.0-5.5 | SUST-B 5.0-5.5 | SUST-C 5.0-5.5 | SUST-D 5.0-5.5 |
| Sample Date | | 7/9/2013 | 7/9/2013 | 7/12/2013 | 7/12/2013 |
| Aroclor-1016 | 200 | < 9.1 | < 9.3 | < 9.6 | < 9.7 |
| Aroclor-1221 | 200 | < 21 | < 21 | < 22 | < 22 |
| Aroclor-1232 | 200 | < 18 | < 18 | < 19 | < 19 |
| Aroclor-1242 | 200 | < 11 | < 11 | < 12 | < 12 |
| Aroclor-1248 | 200 | < 11 | < 11 | < 11 | < 11 |
| Aroclor-1254 | 200 | < 16 | < 17 | < 17 | < 17 |
| Aroclor-1260 | 200 | < 11 | < 12 | **61.3** | **241** |
| Aroclor-1262 | 200 | < 11 | < 11 | < 12 | < 12 |
| Aroclor-1268 | 200 | < 10 | < 10 | < 11 | < 11 |
| **Inorganics (mg/kg)** | | | | | |
| Aluminum | 78,000 | **3,580** | **6,870** | **4,820** | **6,290** |
| Antimony | 31 | < 2.3 | < 2.4 | < 2.3 | < 2.4 |
| Arsenic | 19 | < 2.3 | < 2.4 | **4.4** | **39** |
| Barium | 16,000 | **46.3** | **58.5** | **73.9** | **66.7** |
| Beryllium | 16 | **0.42** | **0.71** | **0.5** | **0.91** |
| Cadmium | 78 | < 0.57 | < 0.59 | < 0.58 | < 0.6 |
| Calcium | NLE | < 570 | < 590 | < 580 | **2,130** |
| Chromium | NLE | **28.1** | **84.4** | **43.2** | **78.9** |
| Chromium, Hexavalent | 240 | NA | NA | < 1.23 | **3.3** |
| Cobalt | 1,600 | < 5.7 | < 5.9 | < 5.8 | < 6 |
| Copper | 3,100 | **3** | **4** | < 2.9 | **15.7** |
| Cyanide | 1,600 | < 0.17 | < 0.24 | < 0.28 | < 0.26 |
| Iron | NLE | **5,750** | **12,500** | **14,400** | **24,200** |
| Lead | 400 | **2.9** | **4.4** | **8.1** | **33.6** |
| Magnesium | NLE | **604** | **1,420** | **978** | **2,280** |
| Manganese | 11,000 | **4.8** | **17.9** | **35.2** | **23** |
| Mercury | 23 | < 0.035 | < 0.033 | **0.04** | **0.096** |
| Nickel | 1,600 | < 4.6 | < 4.7 | < 4.6 | < 4.8 |
| Potassium | NLE | **1,520** | **3,330** | **2,150** | **6,130** |
| Selenium | 390 | < 2.3 | < 2.4 | < 2.3 | < 2.4 |
| Silver | 390 | < 0.57 | < 0.59 | **1** | **1.4** |
| Sodium | NLE | < 1100 | < 1200 | < 1200 | < 1200 |
| Thallium | 5 | < 1.1 | < 1.2 | < 1.2 | < 1.2 |
| Vanadium | 78 | **12.9** | **48.2** | **28.7** | **28.8** |
| Zinc | 23,000 | **10.5** | **17.5** | **23.9** | **48.9** |
| **Wet Chemistry** | | | | | |
| Redox Potential Vs H2 (mv) | NLE | NA | NA | **389** | **379** |
| **Wet Chemistry - pH** | | | | | |
| pH (su) | NLE | NA | NA | **5.51** | **6.84** |

Footnote:

1) NLE = no limit established.

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

3) **Bold** = chemical detection

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

5) Chemical result qualifiers are assigned by the laboratory.

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

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

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

E (or ER) = Estimated result.

R = Rejected, data validation rejected the results.

D = Results from dilution of sample.

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

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

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

JN = Tentatively identified compound, estimated concentration.

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

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

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

- Cell Shade values represent a result that is above the NJ Residential Direct Contact Soil Remediation Standard. ####

  There are no NJDEP soil standards for individual PCB Aroclors, therefore the total PCB NJDEP standards were used for individual Aroclors.

- Cell Shade values represent a result that is above the NJ Non-Residential Direct Contact Soil Remediation Standard. ###

  There are no NJDEP soil standards for individual PCB Aroclors, therefore the total PCB NJDEP standards were used for individual Aroclors.

- Cell Shade values represent a result that is above the NJ Impact to GW Soil Screening Level ###

- Cell Style values represent a result that is above the Weston 1995 Background (Charles Wood). ###

  n/a = all concentrations were less than the detection limit, therefore, no location of maximum value identified.

  Dash (-) = only background concentrations for metals are being used as comparison criteria.

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

- Cell Shade values represent a result that is above both the NJ Residential and Non-Residential Direct Contact Soil Remediation Standard. ###

7) Criteria action level source document and web address.

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

  http://www.nj.gov/dep/rules/rules/njac7_26d.pdf

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

  http://www.nj.gov/dep/rules/rules/njac7_26d.pdf

- The NJ Impact to GW Soil Screening Level criteria refers to the Development of Site Specific Impact to Ground Water Soil Remediation Standards - Nov 2013 revised

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

- The Weston 1995 Background (Charles Wood) refers to the FTMM reports.

# Table 2

## Detected Groundwater Sampling Results, Parcel 35, Fort Monmouth, New Jersey

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TABLE 2
DETECTED GROUND WATER SAMPLING RESULTS
PARCEL 35
FORT MONMOUTH, NEW JERSEY

| Loc ID | NJ Ground Water Quality Criteria | Weston 1995 Background (Charles Wood) | SUST-A | SUST-B |
|---|---|---|---|---|
| Sample ID | | | SUST-A-GW | SUST-B-GW |
| Sample Date | | | 7/31/2013 | 7/31/2013 |
| Sample Round | | | | |
| Filtered | | | Total | Total |
| **Volatile Organic Compounds (µg/l)** | | | | |
| 1,1,1-Trichloroethane | 30 | - | < 0.24 | < 0.24 |
| 1,1,2,2-Tetrachloroethane | 1 | - | < 0.21 | < 0.21 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 100 | - | < 0.53 | < 0.53 |
| 1,1,2-Trichloroethane | 3 | - | < 0.29 | < 0.29 |
| 1,1-Dichloroethane | 50 | - | < 0.11 | < 0.11 |
| 1,1-Dichloroethene | 1 | - | < 0.19 | < 0.19 |
| 1,2,3-Trichlorobenzene | 100 | - | < 0.28 | < 0.28 |
| 1,2,4-Trichlorobenzene | 9 | - | < 0.2 | < 0.2 |
| 1,2-Dibromo-3-chloropropane | 0.02 | - | < 0.54 | < 0.54 |
| 1,2-Dibromoethane | 0.03 | - | < 0.2 | < 0.2 |
| 1,2-Dichlorobenzene | 600 | - | < 0.22 | < 0.22 |
| 1,2-Dichloroethane | 2 | - | < 0.26 | < 0.26 |
| 1,2-Dichloropropane | 1 | - | < 0.48 | < 0.48 |
| 1,3-Dichlorobenzene | 600 | - | < 0.22 | < 0.22 |
| 1,4-Dichlorobenzene | 75 | - | < 0.3 | < 0.3 |
| 1,4-Dioxane | 10 | - | < 75 | < 75 |
| Acetone | 6,000 | - | < 3.3 | < 3.3 |
| Benzene | 1 | - | < 0.24 | < 0.24 |
| Bromochloromethane | 100 | - | < 0.3 | < 0.3 |
| Bromodichloromethane | 1 | - | < 0.21 | < 0.21 |
| Bromoform | 4 | - | < 0.21 | < 0.21 |
| Carbon disulfide | 700 | - | < 0.19 | < 0.19 |
| Carbon tetrachloride | 1 | - | < 0.22 | < 0.22 |
| Chlorobenzene | 50 | - | < 0.23 | < 0.23 |
| Chlorodibromomethane | 1 | - | < 0.14 | < 0.14 |
| Chloroethane | 5 | - | < 0.26 | < 0.26 |
| Chloroform | 70 | - | < 0.2 | < 0.2 |
| Cis-1,2-Dichloroethene | 70 | - | < 0.19 | < 0.19 |
| Cis-1,3-Dichloropropene | 1 | - | < 0.21 | < 0.21 |
| Cyclohexane | 100 | - | < 0.35 | < 0.35 |
| Dichlorodifluoromethane | 1,000 | - | < 0.27 | < 0.27 |
| Ethyl benzene | 700 | - | < 0.23 | < 0.23 |
| Isopropylbenzene | 700 | - | < 0.45 | < 0.45 |
| Meta/Para Xylene | 1,000 | - | < 0.42 | < 0.42 |
| Methyl Acetate | 7,000 | - | < 1.2 | < 1.2 |
| Methyl bromide | 10 | - | < 0.22 | < 0.22 |
| Methyl butyl ketone | 300 | - | < 1.1 | < 1.1 |
| Methyl chloride | 100 | - | < 0.21 | < 0.21 |
| Methyl cyclohexane | NLE | - | < 0.26 | < 0.26 |
| Methyl ethyl ketone | 300 | - | < 2.4 | < 2.4 |
| Methyl isobutyl ketone | 100 | - | < 0.83 | < 0.83 |
| Methyl Tertbutyl Ether | 70 | - | < 0.16 | < 0.16 |

| Loc ID | NJ Ground Water Quality Criteria | Weston 1995 Background (Charles Wood) | SUST-A | SUST-B |
|---|---|---|---|---|
| Sample ID | | | SUST-A-GW | SUST-B-GW |
| Sample Date | | | 7/31/2013 | 7/31/2013 |
| Sample Round | | | | |
| Filtered | | | Total | Total |
| Methylene chloride | 3 | - | < 0.7 | < 0.7 |
| Ortho Xylene | 1,000 | - | < 0.24 | < 0.24 |
| Styrene | 100 | - | < 0.21 | < 0.21 |
| Tetrachloroethene | 1 | - | < 0.28 | < 0.28 |
| Toluene | 600 | - | < 0.23 | < 0.23 |
| Total Xylenes | 1,000 | - | < 0.24 | < 0.24 |
| Trans-1,2-Dichloroethene | 100 | - | < 0.21 | < 0.21 |
| Trans-1,3-Dichloropropene | 1 | - | < 0.19 | < 0.19 |
| Trichloroethene | 1 | - | < 0.22 | < 0.22 |
| Trichlorofluoromethane | 2,000 | - | < 0.27 | < 0.27 |
| Vinyl chloride | 1 | - | < 0.21 | < 0.21 |
| **Semivolatile Organic Compounds (µg/l)** | | | | |
| 1,1'-Biphenyl | 400 | - | < 0.34 | < 0.32 |
| 1,2,4,5-Tetrachlorobenzene | 100 | - | < 0.34 | < 0.32 |
| 2,3,4,6-Tetrachlorophenol | 200 | - | < 1 | < 1 |
| 2,4,5-Trichlorophenol | 700 | - | < 1.7 | < 1.7 |
| 2,4,6-Trichlorophenol | 20 | - | < 1.4 | < 1.4 |
| 2,4-Dichlorophenol | 20 | - | < 1.3 | < 1.2 |
| 2,4-Dimethylphenol | 100 | - | < 1.7 | < 1.6 |
| 2,4-Dinitrophenol | 40 | - | < 18 | < 18 |
| 2,4-Dinitrotoluene | 10 | - | < 0.47 | < 0.45 |
| 2,6-Dinitrotoluene | 10 | - | < 0.51 | < 0.49 |
| 2-Chloronaphthalene | 600 | - | < 0.33 | < 0.32 |
| 2-Chlorophenol | 40 | - | < 1.1 | < 1 |
| 2-Methylnaphthalene | 30 | - | < 0.43 | < 0.41 |
| 2-Methylphenol | 100 | - | < 1.2 | < 1.1 |
| 2-Nitroaniline | 100 | - | < 1.2 | < 1.2 |
| 2-Nitrophenol | 100 | - | < 1.7 | < 1.6 |
| 3&4-Methylphenol | 100 | - | < 1 | < 0.98 |
| 3,3'-Dichlorobenzidine | 30 | - | < 0.4 | < 0.38 |
| 3-Nitroaniline | 100 | - | < 1.4 | < 1.3 |
| 4,6-Dinitro-2-methylphenol | 1 | - | < 1.1 | < 1.1 |
| 4-Bromophenyl phenyl ether | 100 | - | < 0.4 | < 0.38 |
| 4-Chloro-3-methylphenol | 100 | - | < 2 | < 1.9 |
| 4-Chloroaniline | 30 | - | < 0.59 | < 0.56 |
| 4-Chlorophenyl phenyl ether | 100 | - | < 0.35 | < 0.33 |
| 4-Nitroaniline | 5 | - | < 1.8 | < 1.8 |
| 4-Nitrophenol | 100 | - | < 5.8 | < 5.5 |
| Acenaphthene | 400 | - | < 0.023 | < 0.022 |
| Acenaphthylene | 100 | - | < 0.026 | < 0.025 |
| Acetophenone | 700 | - | < 0.32 | < 0.3 |
| Anthracene | 2,000 | - | < 0.023 | < 0.022 |
| Atrazine | 3 | - | < 0.54 | < 0.52 |
| Benzaldehyde | 100 | - | < 3.6 | < 3.5 |
| Benzo(a)anthracene | 0.1 | - | < 0.013 | < 0.012 |
| Benzo(a)pyrene | 0.1 | - | < 0.014 | < 0.013 |
| Benzo(b)fluoranthene | 0.2 | - | < 0.011 | < 0.011 |
| Benzo(ghi)perylene | 100 | - | < 0.017 | < 0.017 |
| Benzo(k)fluoranthene | 0.5 | - | < 0.016 | < 0.016 |

| Loc ID | NJ Ground Water Quality Criteria | Weston 1995 Background (Charles Wood) | SUST-A | SUST-B |
|---|---|---|---|---|
| Sample ID | | | SUST-A-GW | SUST-B-GW |
| Sample Date | | | 7/31/2013 | 7/31/2013 |
| Sample Round | | | | |
| Filtered | | | Total | Total |
| Bis(2-Chloroethoxy)methane | 100 | - | < 0.34 | < 0.33 |
| Bis(2-Chloroethyl)ether | 7 | - | < 0.34 | < 0.33 |
| Bis(2-Chloroisopropyl)ether | 300 | - | < 0.5 | < 0.48 |
| Bis(2-Ethylhexyl)phthalate | 3 | - | **1.6 J** | < 0.62 |
| Butyl benzyl phthalate | 100 | - | < 0.32 | < 0.31 |
| Caprolactam | 5,000 | - | < 0.77 | < 0.73 |
| Carbazole | 100 | - | < 0.4 | < 0.38 |
| Chrysene | 5 | - | < 0.013 | < 0.013 |
| Dibenz(a,h)anthracene | 0.3 | - | < 0.018 | < 0.018 |
| Dibenzofuran | 100 | - | < 0.29 | < 0.28 |
| Diethyl phthalate | 6,000 | - | < 0.36 | < 0.35 |
| Dimethyl phthalate | 100 | - | < 0.31 | < 0.3 |
| Di-n-butylphthalate | 700 | - | < 0.62 | < 0.59 |
| Di-n-octylphthalate | 100 | - | < 0.34 | < 0.33 |
| Fluoranthene | 300 | - | < 0.015 | < 0.014 |
| Fluorene | 300 | - | < 0.019 | < 0.018 |
| Hexachlorobenzene | 0.02 | - | < 0.018 | < 0.018 |
| Hexachlorobutadiene | 1 | - | < 0.57 | < 0.54 |
| Hexachlorocyclopentadiene | 40 | - | < 7.9 | < 7.6 |
| Hexachloroethane | 7 | - | < 0.61 | < 0.59 |
| Indeno(1,2,3-cd)pyrene | 0.2 | - | < 0.016 | < 0.015 |
| Isophorone | 40 | - | < 0.3 | < 0.29 |
| Naphthalene | 300 | - | < 0.039 | < 0.038 |
| Nitrobenzene | 6 | - | < 0.47 | < 0.45 |
| N-Nitroso-di-n-propylamine | 10 | - | < 0.34 | < 0.32 |
| N-Nitrosodiphenylamine | 10 | - | < 0.34 | < 0.32 |
| Pentachlorophenol | 0.3 | - | < 0.11 | < 0.11 |
| Phenanthrene | 100 | - | < 0.023 | < 0.022 |
| Phenol | 2,000 | - | < 1.4 | < 1.4 |
| Pyrene | 200 | - | < 0.017 | < 0.016 |
| **Extractable/Volatile Petroleum Hydrocarbons (mg/l)** | | | | |
| EPH (>C28-C40) | NLE | - | < 0.016 | < 0.017 |
| EPH (C9-C28) | NLE | - | < 0.034 | < 0.036 |
| EPH (C9-C40) | NLE | - | < 0.016 | < 0.017 |
| **Pesticides (µg/l)** | | | | |
| 4,4'-DDD | 0.1 | - | < 0.0026 | < 0.0025 |
| 4,4'-DDE | 0.1 | - | < 0.0018 | < 0.0017 |
| 4,4'-DDT | 0.1 | - | < 0.0033 | < 0.0032 |
| Aldrin | 0.04 | - | < 0.0082 | < 0.0079 |
| Alpha-BHC | 0.02 | - | < 0.0024 | < 0.0023 |
| Alpha-Chlordane | 0.5 | - | < 0.003 | < 0.0029 |
| Beta-BHC | 0.04 | - | < 0.0024 | < 0.0023 |
| Chlordane (Alpha And Gamma Isomers) | NLE | - | < 0.0022 | < 0.0021 |
| Delta-BHC | 100 | - | < 0.0019 | < 0.0019 |
| Dieldrin | 0.03 | - | < 0.0017 | < 0.0016 |
| Endosulfan I | 40 | - | < 0.0029 | < 0.0028 |
| Endosulfan II | 40 | - | < 0.0021 | < 0.002 |
| Endosulfan sulfate | 40 | - | < 0.002 | < 0.0019 |
| Endrin | 2 | - | < 0.0021 | < 0.002 |

| Loc ID | NJ Ground Water Quality Criteria | Weston 1995 Background (Charles Wood) | SUST-A | SUST-B |
|---|---|---|---|---|
| Sample ID | | | SUST-A-GW | SUST-B-GW |
| Sample Date | | | 7/31/2013 | 7/31/2013 |
| Sample Round | | | | |
| Filtered | | | Total | Total |
| Endrin aldehyde | 100 | - | < 0.0038 | < 0.0037 |
| Endrin ketone | 100 | - | < 0.0049 | < 0.0047 |
| Gamma-BHC/Lindane | 0.03 | - | < 0.0018 | < 0.0017 |
| Gamma-Chlordane | 0.5 | - | < 0.0022 | < 0.0021 |
| Heptachlor | 0.05 | - | < 0.0023 | < 0.0022 |
| Heptachlor epoxide | 0.2 | - | < 0.0027 | < 0.0026 |
| Methoxychlor | 40 | - | < 0.0042 | < 0.0041 |
| Toxaphene | 2 | - | < 0.15 | < 0.15 |
| **PCBs (µg/l)** | | | | |
| Aroclor-1016 | 0.5 | - | < 0.13 | < 0.13 |
| Aroclor-1221 | 0.5 | - | < 0.28 | < 0.27 |
| Aroclor-1232 | 0.5 | - | < 0.4 | < 0.39 |
| Aroclor-1242 | 0.5 | - | < 0.09 | < 0.086 |
| Aroclor-1248 | 0.5 | - | < 0.15 | < 0.15 |
| Aroclor-1254 | 0.5 | - | < 0.15 | < 0.14 |
| Aroclor-1260 | 0.5 | - | < 0.22 | < 0.21 |
| Aroclor-1262 | 0.5 | - | < 0.063 | < 0.06 |
| Aroclor-1268 | 0.5 | - | < 0.14 | < 0.13 |
| **Inorganics (µg/l)** | | | | |
| Aluminum | 200 | 8,210 | **6,130** | **1,500** |
| Antimony | 6 | ND | < 6 | < 6 |
| Arsenic | 3 | 25.1 | **12.5** | < 3 |
| Barium | 6,000 | 192 | < 200 | < 200 |
| Beryllium | 1 | 2.8 | **1** | < 1 |
| Cadmium | 4 | 3.7 | < 3 | < 3 |
| Calcium | NLE | 8,700 | **15,600** | **14,100** |
| Chromium | 70 | 49.6 | **82.5** | **20.6** |
| Chromium, Hexavalent | NLE | ND | < 0.01 | < 0.01 |
| Cobalt | 100 | 30.6 | < 50 | < 50 |
| Copper | 1,300 | 9.8 | < 10 | < 10 |
| Cyanide | 0.1 | ND | < 0.01 | < 0.01 |
| Iron | 300 | 19,600 | **25,900** | **8,010** |
| Lead | 5 | 7.3 | **7.6** | < 3 |
| Magnesium | NLE | 7,160 | < 5000 | < 5000 |
| Manganese | 50 | 232 | **99.3** | **78.7** |
| Mercury | 2 | ND | < 0.2 | < 0.2 |
| Nickel | 100 | 48.3 | < 10 | < 10 |
| Potassium | NLE | 4,630 | < 10000 | < 10000 |
| Selenium | 40 | 3.8 | < 10 | < 10 |
| Silver | 40 | ND | < 10 | < 10 |
| Sodium | 50,000 | 36,400 | < 10000 | < 10000 |
| Thallium | 2 | ND | < 2 | < 2 |
| Vanadium | NLE | 28.9 | < 50 | < 50 |
| Zinc | 2,000 | 133 | **63.3** | **22.5** |
| **Wet Chemistry - pH** | | | | |
| pH (su) | NLE | - | **6.89** | **6.71** |

Footnote:

1) NLE = no limit established.

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

3) Bold chemical detection

4) Chemical result qualifiers are assigned by the laboratory.

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

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

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

E (or ER) = Estimated result.

R = Rejected, data validation rejected the results.

D = Results from dilution of sample.

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

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

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

JN = Tentatively identified compound, estimated concentration.

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

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

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

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

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

- Cell Style values represent a result that is above the Weston 1995 Background (Charles Wood). ###

n/a = all concentrations were less than the detection limit, therefore, no location of maximum value identified.

Dash (-) = only background concentrations for metals are being used as comparison criteria.

6) Criteria action level source document and web address.

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

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

- The Weston 1995 Background (Charles Wood) refers to the FTMM reports.

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# Table 3

## 2017 Background Soil Sample Results and Comparison to Soil Remediation Standards, Parcel 35, Fort Monmouth, New Jersey

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TABLE 3
2017 BACKGROUND SOIL SAMPLE RESULTS AND COMPARISON TO SOIL REMEDIATION STANDARDS
PARCEL 35
FORT MONMOUTH, NEW JERSEY

| | | | | | | CLIENT ID: | BKG-35-001 | | BKG-35-001-FD | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | LAB ID: | AC98154-001 | | AC98154-002 | |
| | | | | | | COLLECTION DATE: | 5/26/2017 | | 5/26/2017 | |
| | | | | | | SAMPLE MATRIX: | Soil | | Soil | |
| | | | | | | SAMPLE UNITS: | mg/Kg | | mg/Kg | |
| | | | NJ Residential Direct Contact SRS | NJ Non-Residential Direct Contact SRS | NJ Impact to GW Soil Screening Level | | | | | |
| **TestCode** | **CAS#** | **Analyte** | mg/Kg | mg/Kg | mg/Kg | | Result | RL | Result | RL |
| | | **PCBs** | | | | | | | | |
| PCB-8082 | 1336-36-3 | Aroclor (Total) | 0.2 | 1 | 0.2 | | ND | 0.03 | ND | 0.03 |
| PCB-8082 | 12674-11-2 | Aroclor-1016 | 0.2 | 1 | 0.2 | | ND | 0.03 | ND | 0.03 |
| PCB-8082 | 11104-28-2 | Aroclor-1221 | 0.2 | 1 | 0.2 | | ND | 0.03 | ND | 0.03 |
| PCB-8082 | 11141-16-5 | Aroclor-1232 | 0.2 | 1 | 0.2 | | ND | 0.03 | ND | 0.03 |
| PCB-8082 | 53469-21-9 | Aroclor-1242 | 0.2 | 1 | 0.2 | | ND | 0.03 | ND | 0.03 |
| PCB-8082 | 12672-29-6 | Aroclor-1248 | 0.2 | 1 | 0.2 | | ND | 0.03 | ND | 0.03 |
| PCB-8082 | 11097-69-1 | Aroclor-1254 | 0.2 | 1 | 0.2 | | ND | 0.03 | ND | 0.03 |
| PCB-8082 | 11096-82-5 | Aroclor-1260 | 0.2 | 1 | 0.2 | | ND | 0.03 | ND | 0.03 |
| PCB-8082 | 37324-23-5 | Aroclor-1262 | NA | NA | NA | | ND | 0.03 | ND | 0.03 |
| PCB-8082 | 11100-14-4 | Aroclor-1268 | NA | NA | NA | | ND | 0.03 | ND | 0.03 |
| | | **TPH** | | | | | | | | |
| 8015-EPHCAT2 | EPHC9C40 | C9-C40 | NA | NA | NA | | ND | 73 | ND | 71 |
| | | **Wet Chemistry** | | | | | | | | |
| %SOLIDS | PERSOL | % Solids | NA | NA | NA | | 82(Percent) | | 84(Percent) | |

Result exceeds at least one criterion (none for these samples)
**Bold** Positive result detected below all criteria (no detections for these samples)

NJ Soil Remediation Standards
Note 1) Residential and Non-residential critieria from the NJDEP June 2, 2008 Soil Remediation Standards
Note 2) Dec 2008 DEP guidance document for the development of site-specific IGW soil remediation standards using the soil-water partition equation.

N/A No criterion derived for this contaminant.

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# Appendix A

# Correspondence Between NJDEP and the Army Related to Parcel 35

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State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Site Remediation Waste Management Program

BOB MARTIN
Commissioner

December 4, 2017

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

**Re: Request for NFA Determination ECP Parcel 35, Former Building 2560, Test Pit SUST-D**
Fort Monmouth
Oceanport, Monmouth County
Preferred ID: G000000032

Dear Mr. Colvin:

The New Jersey Department of Environmental Protection (Department) has completed review of ECP Parcel 35, Former Building 2560, Test Pit SUST-D request for No Further Action prepared by the Department of the Army's Office of Assistant Chief of Staff for Installation Management to request final determination of No Further Action for ECP Parcel 35, Former Building 2560, Test Pit SUST-D. Based on the Department's review, it is agreed that no additional action is necessary.

Please contact A. J. Joshi at (973) 656-4427 if you have any questions.

Sincerely,

Gwen B. Zervas, P.E.
Section Chief

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

DEPARTMENT OF THE ARMY

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

01 November 2017

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

Subject: Request for No Further Action Determination at ECP Parcel 35, Former Building 2560, Test Pit SUST-D, Fort Monmouth, New Jersey, PI G000000032

References:
1. US Army letter dated 15 June 2017; subject as above.
2. NJDEP letter dated 19 June 2017; subject as above.

Dear Mr. Joshi:

In response to Reference 1, Reference 2 stated that issuance of the requested designation of no further action necessary will be appropriate upon receipt of the disposal documentation. The certificates of disposal are attached. Also attached are certifications for the backfill used following excavation.

Please call (732-380-7064) or email (william.r.colvin18.civ@mail.mil) me if you have any questions.

Sincerely,

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

cc: J. Moore, USACE
J. Pearson, Calibre Systems
K. Dante, FMERA
J. Fallon, FMERA
W. Colvin, DAIM-ODB-F

US ecology CERTIFICATE OF DISPOSAL

*FOR MANIFESTED PCB WASTE*

This certificate is to verify the wastes identified as PCB Solids

and specified on Manifest # 011854799JJK. Line Item 1 has been landfilled on 9/25, 17 in accordance with all local, state and federal regulations by:

# *Wayne Disposal, Inc*

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 800-592-5489
Fax: 800-593-5329

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: _____

US ecology CERTIFICATE OF DISPOSAL

***FOR MANIFESTED PCB WASTE***

This certificate is to verify the wastes identified as PCB Solids

and specified on Manifest # 011854800JJK, Line Item 1 has been landfilled on

9/20, 17 in accordance with all local, state and federal regulations by:

# *Wayne Disposal, Inc*

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 800-592-5489
Fax: 800-593-5329

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: _____

US ecology CERTIFICATE OF DISPOSAL

***FOR MANIFESTED PCB WASTE***

This certificate is to verify the wastes identified as PCB Solids

and specified on Manifest # 011854798JJK, Line Item 1 has been landfilled on

9/18, 17 in accordance with all local, state and federal regulations by:

# *Wayne Disposal, Inc*

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 800-592-5489
Fax: 800-593-5329

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: _____

Maddox Materials, LLC
Quality Aggregates & Construction Soils

May 24, 2017

AWT Environmental
PO Box 128
Sayreville, NJ 08871

Attn: Mario Postorino
Phone: 732-613-1660
Fax: 732-613-1536

Project: Rt. 35
Fort Monmouth
PO# 15252MP

To whom it may concern:

Please be advised that the topsoil Maddox proposes to deliver to the above referenced project originates from Dun-Rite Sand & Gravel located on Broad St., Vineland, NJ, Cumberland County tax map Blocks 7301, 7801 & 7906; Lots 39, 18, 35.19. It is a NJ state permitted registered mine permit# 004336. It is free of any hazardous materials or contamination and is considered to be clean virgin material.

If you need any additional information please contact me at 732-251-0054.

Respectfully Submitted,

Darane Bognar
VP of Operations

Maddox Materials, LLC
Quality Aggregates & Construction Soils

May 24, 2017

AWT Environmental
PO Box 128
Sayreville, NJ 08871

Attn: Mario Postorino
Phone: 732-613-1660
Fax: 732-613-1536

Project: Rt. 35
Fort Monmouth
PO# 15252MP

To whom it may concern:

Please be advised that the DGA Maddox proposes to deliver to the above referenced project originates from Trap Rock Industries Kingston, NJ. Somerset County tax map Block 1 Lots 1,2,3,38,39. The crushed stones are produced from virgin, hard, durable, diabase trap rock stone. This site has been tested by Accredited Analytical Resources, LLC work order# 1700016 and found to be acceptable for residential development.

If you need any additional information, please contact me at 732-251-0054.

Respectfully Submitted,

William Maddox
Member

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Case Management
Mail Code 401-05F
P.O. Box 420
Trenton, New Jersey 08625-0420
Telephone: 609-633-1455
Fax #: 609-292-2117

CHRIS CHRISTIE
*Governor*

KIM GUADAGNO
*Lt. Governor*

BOB MARTIN
*Commissioner*

June 19, 2017

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

Re: *Request for No Further Action Determination at Parcel 35, Former Building 2560, Test Pit SUST-D*
Fort Monmouth
SRP PI# G000000032

Dear Mr. Colvin:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced report, received on June 15, 2017, prepared by the Department of the Army's Office of Assistant Chief of Staff for Installation Management. The Department concurs with the Department of the Army that no additional investigation or soil removal is necessary for Test Pit SUST-D, at Parcel 35 Former Building 2560. This office looks forward to receipt of the disposal documentation, to be submitted under separate cover, at which time issuance of the requested designation of no further action necessary will be appropriate.

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

Sincerely,

Linda Range

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

**DEPARTMENT OF THE ARMY**

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

15 June 2017

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

**Subject: Request for No Further Action Determination at ECP Parcel 35, Former Building 2560, Test Pit SUST-D, Fort Monmouth, New Jersey**
**PI G000000032**

**Attachments:**

A. Figures:
   a. Figure 1: Parcel 35 Layout
   b. Figure 2: Parcel 35 Soil Results
B. Table 1: 2017 Background Soil Sample Results
C. 2017 Analytical Data Package
D. Backfill Certificates

Dear Ms. Range:

The U.S. Army Fort Monmouth (FTMM) Team has completed site restoration activities at the subject site located in the Charles Wood Area of Fort Monmouth (see Figure 1). In July 2013, soil sampling was performed as part of a subsurface investigation of a suspected underground storage tank (Department of the Army, 2017). The analytical results from the 2013 sampling at the subject test pit reported Aroclor-1260 (a polychlorinated biphenyl [PCB]) at a concentration of 0.241 mg/kg, just above the New Jersey Department of Environmental Protection (NJDEP) Residential Direct Contact Soil Remediation Standards (RDCSRS) of 0.20 mg/kg. Site restoration activities were conducted in May 2017 to unearth soils that were not suitable for re-development and to repair property damaged by previous site investigation activities. The Army is committed to maintaining good stewardship of the environment and therefore all unearthed soils were containerized and characterized for proper disposal. A background sample was collected after site restoration activities to document existing site conditions (see Table 1 and Attachment C). All background soil sample constituents were less than the NJDEP RDCSRS.

Following is a summary of the site restoration activities performed in May 2017 at the site of former Test Pit SUST-D:

- A 6 ft by 6 ft by 6 ft deep volume of soil was unearthed, containerized and sampled for waste disposal profiling. Background sample BKG-35-001 was collected from the bottom

of the excavation and analyzed for PCBs and Total Petroleum Hydrocarbons (TPH); none of these analytes were detected in the background sample (Table 1). The excavation was backfilled with crushed stone and covered with topsoil; backfill material certificates are presented in Attachment D.

A NFA determination is requested for ECP Parcel 35, if possible, without the disposal documentation that will be provided to NJDEP when available. The technical Point of Contact (POC) for this matter is Kent Friesen at (732) 383-7201; kent.friesen@parsons.com. Should you have any questions or require additional information, please contact me by phone at (732) 380-7064; william.r.colvin18.civ@mail.mil.

Sincerely,

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

cc: Linda Range, NJDEP (2 hard copies)
Joseph Pearson, Calibre (e-mail)
James Moore, USACE (e-mail)
Jim Kelly, USACE (e-mail)
Cris Grill, Parsons (e-mail)
W. Colvin (e-mail)

**References Cited:**

Department of the Army. 2017. Letter to NJDEP, Re: *No Further Action Request, Site Investigation Report Addendum for ECP Parcel 35 Septic Tank at Pool Area and Suspected Underground Storage Tank At Former Building 2560.* February 21.

NJDEP. April, 2017. Letter to William Colvin, Re: *No Further Action Request Site Investigation Report Addendum for ECP Parcel 35 Septic Tank at Pool Area and Suspected Underground Storage Tank At Former Building 2560, Fort Monmouth, Oceanport, Monmouth County.* April 6.

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

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

BOB MARTIN
Commissioner

April 6, 2017

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

Re: *No Further Action Request Site Investigation Report Addendum for ECP Parcel 35 Septic Tank at Pool Area and Suspected Underground Storage Tank at Former Building 2560*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin,

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced report, received February 23, 2017, prepared by the Department of the Army's Office of Assistant Chief of Staff for Installation Management in response to the NJDEP letter correspondence of April 29, 2013 regarding same. Comments are as follows:

**Suspected Underground Storage Tank at Building 2560**

An investigation of soil and ground water was conducted in the area of the suspected former underground storage tank (UST) at Building 2560. Analytical results indicate all constituents related to #2 fuel are below applicable standards. It is therefore agreed no further action is necessary relative to the UST.

*Arsenic* – Arsenic was found in both soil and ground water. Based on the sample results, soil type and the documentation submitted to support same, it has been determined that the levels are present due to naturally occurring background conditions, not as the result of a discharge, and no additional action is necessary.

*PCBs* – Test pit "D" was found to contain large amounts of debris; analytical results indicated PCBs were present at 0.241 ppm, above the applicable standard. It is agreed delineation is necessary.

**Septic Tank at Pool Area**

The former septic tank was investigated via the collection of soil and ground water samples. All soil analytical results were below applicable standards except arsenic. Ground water analytical results were largely non-detect, however, certain metals did exceed the Ground Water Quality Standards. Based upon the analytical results, the soil type encountered, and the documentation submitted to support same, it is agreed the levels are representative of turbidity and/or naturally occurring background conditions, not as the result of a discharge, and no additional action is necessary.

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

Linda S. Range

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

**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**

21 February 2017

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

**Re: No Further Action Request**
**Site Investigation Report Addendum for ECP Parcel 35 Septic Tank at Pool Area and Suspected Underground Storage Tank at Former Building 2560**
**Fort Monmouth, New Jersey**

**Attachments:**

A. Previous Parcel 35 Correspondence
B. Historical Drawings
C. Figure 2 Corregidor-Guam Area Test Pit Location Map (showing sample locations)
D. Test Pit Records (Photographs and Field Notes)
E. Soil Sampling Results (Table 1)
F. Groundwater Sampling Results (Table 2)
G. Locations of Exceedances of RDCSRS and GWQS
H. Laboratory Data Reports
I. Weston (1995) Site Investigation Report Excerpt (CW-5 Former Sanitary Treatment Plant)

**Previous Correspondence (Attachment A):**

1. NJDEP letter to Calibre Systems dated 29 April 2013, re: *Draft Finding of Suitability to Transfer (FOST) dated March 2013, Charles Wood Area, Fort Monmouth, New Jersey.*
2. U.S. Army letter to NJDEP dated 17 May 2013, re: *Proposed Test Pit Investigation Plan for Parcel 28 Historical Septic Tank Systems and Gas Station, Charles Wood Area, Fort Monmouth, New Jersey.*
3. NJDEP letter to the U.S. Army dated 3 June 2013, re: *Proposed Test Pit Investigation Plan for Parcel 28 Historical Septic Tank Systems & Gas Station, Charles Wood Area, Fort Monmouth, New Jersey.*

Dear Ms. Range:

The U.S. Army Fort Monmouth (FTMM) Team has reviewed and summarized the results of environmental investigations at the Environmental Condition of Property (ECP) Parcel 35 Septic

Tank at Pool Area and Suspected Underground Storage Tank at Former Building 2560 in this Site Investigation (SI) Report Addendum.

Correspondence 1 (**Attachment A**) includes New Jersey Department of Environmental Protection (NJDEP) comments on the 2013 Finding of Suitability to Transfer (FOST), indicating that NJDEP did not concur with the determination of no discharge for a former underground storage tank (UST) adjacent to Building 2560. Correspondence 2 describes the proposed test pit investigations for septic tank systems at adjacent Parcel 28 within the Charles Wood Area, and Correspondence 3 provides NJDEP approval of the Parcel 28 investigation. Investigation of the former septic tank system at nearby Parcel 35 was included in the Parcel 28 field investigations in July 2013 based on site similarity and proximity. Field investigation of the nearby suspected UST at Building 2560 was also provided at that time. A site background description and the results of the soil and groundwater sampling completed at the subject portions of Parcel 35 are summarized below.

## 1.0 SITE DESCRIPTION

Parcel 35 was originally identified in the 2007 ECP Report as a 59-acre area in the central portion of the Charles Wood Area of FTMM. An approximately 0.1 acre "carve-out" area requiring additional environmental investigation was identified in the 2013 FOST at the southeast corner of Corregidor Road and Guam Lane, and was designated as the "ECP Parcel 35 Septic Tank at Pool Area." The suspected UST at Building 2560 was also located within Parcel 35 but was not designated as a carve-out. Additional historical information for the subject sites is provided below.

A septic tank that was designated as "out of service" was identified on a 1948 utility plan for the Charles Wood Area (see **Attachment B**) just southeast of the intersection of the streets now known as Corregidor Road and Guam Lane. This septic tank was located north of the FTMM-27 Former Charles Wood Sanitary Treatment Plant (CW-5), which was previously approved for a No Further Action (NFA) determination by NJDEP in 1996, as discussed in the FOST. This septic tank was downstream of a 12-inch diameter vitrified clay pipe that may have been subsequently re-routed to the FTMM-27 sewage treatment plant, based on the drawing (**Attachment B**).

A suspected UST was identified near former Building 2560 on a 1956 gas distribution, gasoline and fuel storage drawing (provided in **Attachment B**). A feature designated in the drawing legend as an "oil storage tank" is located just west of Building 2560, a sewage treatment plant building that is no longer present. Based on the map designation and real property records, this UST was a fuel oil tank used for heating Building 2560. Therefore, the potential for soil or groundwater contamination at the location of the suspected UST at former Building 2560 was also evaluated in response to NJDEP's 29 April 2013 comments on the Phase 1 FOST (**Attachment A**).

Groundwater flow direction in this area is estimated to be towards the northeast, based on 1994 through 2001 quarterly groundwater monitoring performed at nearby UST 2562 (see the Building 2562 drawing in **Attachment B**). Groundwater was reportedly encountered approximately 4 feet below ground surface (ft bgs) at this location. UST 2562 was approved for No Further Action (NFA) by NJDEP in 2003 and the monitor wells were subsequently abandoned in 2005.

## 1.1 FIELD INVESTIGATIONS

To evaluate potential impacts from the septic tank, the Army excavated five test pits at the area labeled as "Former Septic System at Corner of Guam Lane and Corregidor Road," as shown in **Attachment C.** The soil and groundwater samples from these test pit locations A through E were subsequently designated as FFSGC-A through FFSGC-E. The test pits were completed on 8, 9, and 12 July 2013. Visual observations of soil were recorded and soil samples were also collected. Soil samples were collected directly from the test pits in accordance with the procedures described for Parcel 28 in the Army's 17 May 2013 Work Plan (**Attachment A**). Groundwater samples were collected (using a bailer) from temporary wells installed at all five test pit locations on 17 and 26 July 2013 using a Geoprobe rig. Test pit and groundwater sampling records, including photographs and field notes, are provided in **Attachment D**. The septic tank was not encountered in the test pits; however, materials observed in the test pits provided evidence of a former septic tank, including pea gravel and terra cotta pipe. Green glauconitic sand or clay was typically encountered in the bottom of the test pits at approximately 3 to 5 feet below ground surface (ft bgs), which represents native soil that likely extends into groundwater. One soil sample from each test pit was collected at a depth of 5 to 5.5 feet bgs, which was estimated to be within six inches of groundwater.

The Army also excavated four test pits at the area labeled as "Suspected Underground Storage Tank at Former Building 2560," as shown in **Attachment C.** The soil samples from these test pit locations A through D were subsequently designated as SUST-A through SUST-D. The test pits were completed on 9 and 12 July 2013. Visual observations of soil were recorded and collection of soil samples was also performed. Soil samples were collected directly from the test pits in accordance with the procedures described for Parcel 28 in the Army's 17 May 2013 Work Plan (**Attachment A**). Groundwater samples were collected with a bailer from temporary wells installed at two of the test pit locations (SUST-A and SUST-B) on 31 July 2013 using a Geoprobe rig. Test pit and groundwater sampling records, including photographs and field notes, are provided in **Attachment D**. There was no UST encountered in the test pits; however, black stained soil with petroleum odor was observed in test pit SUST-C, which was consistent with a former fuel oil UST at this location. Debris including concrete pieces and electrical conduit were only observed in test pit SUST-D, suggesting the presence of fill. Green glauconitic sand was encountered in the bottom of several test pits at approximately 5 to 6.5 ft bgs, which represents native soil that likely extends into groundwater.

## 1.2 ANALYTICAL RESULTS

Soil and groundwater samples from both the former septic tank and the suspected UST areas were analyzed for USEPA Target Compound List (TCL) plus Tentatively Identified Compounds (TICs)/Target Analyte List (TCL+TICs/TAL), which includes volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals (including hexavalent chromium), pesticides, and polychlorinated biphenyls (PCBs). The samples were also analyzed for fractionated extractable petroleum hydrocarbons (EPH) and pH. Analytical results are presented in Table 1 for soil (**Attachment E**), and Table 2 for groundwater (**Attachment F**). All detected results were compared to the NJDEP Residential Direct Contact Soil Remediation Standards (RDCSRS) and Impact to Ground Water (IGW) Soil Screening Level (SSL) for soil, and the NJDEP Ground Water Quality Criteria (GWQC) for groundwater. The results are discussed for each area below.

### 1.2.1 Septic Tank at Pool Area

Analytical results for soil samples FFSGC-A through FFSGC-E from the Parcel 35 Septic Tank at Pool Area are presented in Table 1 (**Attachment E**), and the associated analytical data packages are provided in **Attachment H**. EPH and PCBs were not detected in these soil samples. Detections of VOCs, SVOCs, and pesticides were below their respective RDCSRS. All metals except one (arsenic) were below their respective RDCSRSs. Arsenic was detected at two locations (FFSGC-B at 40.5 mg/kg, and FFSGC-D at 30.5 mg/kg; see Table 1) in excess of the RDCSRS concentration of 19 mg/kg.

The locations of RDCSRS exceedances are presented in **Attachment G**. The arsenic concentrations in soil are not believed to be indicative of a release for the following reasons:

- There are no identified sources of arsenic based on the former operations at Parcel 35.
- The detected arsenic concentrations are just above the RDCSRS (19 mg/kg), which is based on the natural background mean concentrations of arsenic in New Jersey. FTMM is located in an area with glauconitic soils that are known to have elevated natural arsenic concentrations, in some cases above the RDCSRS (Dooley, 2001; and Barringer, et al. 2014).
- Arsenic concentrations at Parcel 35 are within the range found in glauconitic soils in the New Jersey Coastal Plain. Dooley (2001) analyzed 113 glauconitic (whole) soil samples from the Coastal Plain and found that the arsenic concentration ranged from <0.26 parts per million (ppm) to 92.3 ppm, with a reported 9.5 ppm median and a 16.1 ± 18.8 ppm mean. Using the 371 ppm arsenic reported for one of the duplicates yielded a median arsenic concentration of 9.8 ppm with a 19.4 ± 38.5 ppm mean. The maximum concentration of arsenic at Parcel 35 was 40.5 mg/kg, which is well within the range encountered by Dooley (2001).
- Field observations from test pits FFSGC-B and FFSGC-D indicate that glauconitic sand and clay were present at Parcel 35.
- Exceedances of the arsenic RDCSRS in the two samples generally do not correlate with other metal or organic exceedances or occurrences.
- Only native soils were observed in test pit FFSGC-D, instead of debris or potential fill materials related to a septic tank. However, pea gravel was observed in FFSGC-B, which is likely attributable to the former septic tank.

Based on the analytical evidence from the five soil sample locations, the soil arsenic results are likely due to naturally occurring background soil conditions associated with glauconitic soils, rather than from a discharge of arsenic-bearing materials to soils through the former septic tank.

Aluminum, arsenic and beryllium were the only analytes detected in excess of their respective IGW SSLs. Arsenic and beryllium concentrations in glauconitic soils of the New Jersey Coastal Plain are known to be naturally elevated (Dooley, 2001). Further, there were no exceedances of the beryllium GWQC in site groundwater samples (discussed further below). Although we have not found documentation associating aluminum with glauconitic soils, in the absence of other metal contaminants, there is no implication of aluminum as a septic tank-related contaminant and no indication that a spill or release has occurred at this location.

Five groundwater samples (FFSGC-A through FFSGC-E) were collected from temporary monitoring wells installed within each test pit location. The groundwater samples were collected

with a bailer and analyzed for VOCs, SVOCs, metals, pesticides, PCBs, fractionated EPH, pH, hexavalent chromium, and cyanide. The groundwater sample results are presented in **Table 2 (Attachment F)**, and the associated analytical data packages are provided in **Attachment H**. The following observations were made from the groundwater analytical results:

- Pesticides, PCBs, hexavalent chromium and cyanide were not detected in any of the groundwater samples.
- One VOC (chlorobenzene) was detected in site groundwater but at concentrations well below the GWQS of 50 µg/L.
- Two SVOCs were detected in site groundwater (both compounds are phthalates), but only bis(2-ethylhexyl) phthalate was detected in one sample at a concentration (6.8 µg/L) that exceeded the GWQS of 3 µg/L. However, phthalates are common field and laboratory contaminants and, therefore, this result is likely not indicative of actual site contamination. For example, bis(2-ethylhexyl) phthalate was also sporadically detected above the GWQS in multiple wells at concentrations as high as 10.9 µg/L during historical monitoring at Installation Restoration Program (IRP) Site FTMM-66, but was not attributed to site contamination, as presented in the 2013 annual groundwater monitoring report for FTMM (Parsons, 2014). The low concentration of bis(2-ethylhexyl) phthalate in one Parcel 35 groundwater sample is not considered to be related to a release, is not a site-related Contaminant of Potential Concern (COPC) in groundwater, and is likely related to laboratory cross-contamination albeit at low levels.
- EPH was detected in one sample at 0.202 milligrams per liter (mg/L); however, a GWQS is not available for EPH. Therefore, EPH is not considered a site-related COPC in groundwater.
- As shown on **Table 2**, aluminum (306 to 7,650 µg/L) and arsenic (7.3 to 11.1 µg/L) were detected above their respective GWQS, but below the groundwater background values for the Charles Wood Area (Weston, 1995). Iron (52,200 to 71,600 µg/L), lead (6.5 to 13.6 µg/L) and manganese (285 to 399 µg/L) were detected above both the NJDEP GWQS and the Charles Wood Area background values (Weston, 1995). However, iron is considered an essential nutrient and therefore is not a COPC. Lead exceeded both the GWQS and background at one location (FFSGC-B). Manganese exceeded the GWQS and background at all 5 sample locations.
- Glauconitic soils were noted in the test pits (**Attachment D**). These types of soils typically contain elevated levels of metals including arsenic (Dooley, 1998 and 2001; and Barringer, et al. 2014), which can contribute to elevated concentrations in groundwater.

The locations of GWQS exceedances are presented in **Attachment G**. Since the groundwater samples were collected with a bailer from temporary wells, sample turbidity is likely to be a contributing cause of slightly elevated metal results, including iron, lead and manganese. Naturally-occurring elevated arsenic concentrations in soils and groundwater may also be due to glauconitic sand and clay found in the bottom of the test pits. Neither lead nor manganese exceeded the NJDEP IGW SSL in any soil sample (**Table 1**); therefore, it is unlikely that these metals represent contamination impacts to groundwater from site soils. Aluminum concentrations are elevated in background groundwater unaffected by site impacts (Weston, 1995) and therefore the aluminum exceedances are not indicative of a release at this site.

In summary, the laboratory results from this investigation indicate that the soil and groundwater were not significantly impacted by the Parcel 35 Septic Tank at Pool Area.

### 1.2.2 Suspected Underground Storage Tank at Former Building 2560

Analytical results for soil samples SUST-A through SUST-D from the Suspected UST at Former Building 2560 are presented in Table 1 (**Attachment E**), and the associated analytical data packages are provided in **Attachment H**. Detections of VOCs, SVOCs, pesticides, and metals (except arsenic) were below their respective RDCSRS.

Total EPH was measured in one soil sample (SUST-C) at 4,830 mg/kg, which (along with field observations of petroleum odor and stained soil at this location) suggests that a petroleum release had occurred in the past. However, the total EPH concentration is less than the NJDEP soil remediation standard of 5,100 mg/kg for fuel oil (NJDEP, 2010). The NJDEP (2010) requirement for contingency analyses of 2-methylnaphthalene and naphthalene was also satisfied, and these compounds were not detected. Several polynuclear aromatic hydrocarbons (PAHs) were detected in this sample; however, as reported above, there were no exceedances of RDCSRSs for individual SVOCs. These results appear consistent with a weathered fuel oil UST site. In summary, characterization of the suspected fuel oil UST for soil EPH and contingency analyses is complete.

PCB and arsenic were also detected in soil above their respective RDCSRSs. Aroclor-1260 was detected in one soil sample (SUST-D) at a concentration of 0.241 mg/kg, which is just above the RDCSRS of 0.20 mg/kg. Observations from test pit SUST-D were consistent with fill material (including debris such as concrete pieces and electrical conduit) which could be associated with the exceedance of the RDCSRS for PCBs. Fill material was not observed and PCBs were not found above the RDCSRS in the other three test pit samples (SUST-A, SUST-B, and SUST-C). The PCB exceedance at SUST-D is generally delineated towards the north, west and south by the other three test pit samples and is bounded to the east by the physical boundary of former Building 2560 and the former wastewater treatment plant as shown on the historical drawings in **Attachment B**. Two soil borings were sampled within the CW-5 former wastewater treatment plant during the Weston (1995) SI and analyzed for PCBs (**Attachment I**). These borings were located approximately 250 feet east from the SUST-D test pit, and therefore provide a distant analytical boundary for the PCB in soil and the fill/debris detected in the SUST-D test pit.

Arsenic was also detected at soil sample location SUST-D (39 mg/kg; see Table 1) in excess of the RDCSRS concentration of 19 mg/kg. Considering similar evidence as previously presented for the Septic Tank at the Pool Area (Section 1.2.1), the arsenic concentration is likely due to glauconitic soils which are present in natural soils at the site.

Aluminum, arsenic, beryllium and silver were the only analytes detected in excess of their respective IGW SSLs. However, these metals are not indicative of fuel oil contamination but are more likely attributable to glauconitic soils or naturally-occurring elevated background conditions.

In summary, there is no historical documentation or record of a spill or release at this site and arsenic is attributable to the naturally occurring glauconitic soils at the site. However, the test pit observations and soil analyses suggest that a release has occurred at the fuel oil tank but the residual petroleum contamination is below the NJDEP soil remediation standard. The slightly elevated PCBs in soil are likely associated with the fill or debris rather than the Suspected UST at Former Building 2560. Additional measures are warranted for this PCB occurrence as described in Section 1.3.

Two groundwater samples (SUST-A and SUST-B) were also collected from temporary monitoring wells installed within each of these two test pit locations. The groundwater samples were collected with a bailer and analyzed for VOCs, SVOCs, metals, pesticides, PCBs, fractionated EPH, pH, hexavalent chromium, and cyanide. The groundwater sample results are presented in **Table 2 (Attachment F)**, and the associated analytical data packages are provided in **Attachment H**. The following observations were made from the groundwater analytical results:

- VOCs, EPH, pesticides, PCBs, hexavalent chromium and cyanide were not detected in any of the groundwater samples.
- One SVOC (bis[2-ethylhexyl] phthalate) was detected at a concentration below the GWQS of 3 µg/L.
- Aluminum (1,500 to 6,130 µg/L), arsenic (12.5 µg/L) and manganese (78.7 to 99.3 µg/L) were detected above their respective GWQS but below the Charles Wood Area background values (8,210, 25.1, and 232 µg/L, respectively; see **Table 2**) from Weston (1995). Chromium (82.5 µg/L), iron (8,010 to 25,900 µg/L), and lead (7.6 µg/L) were detected above both the NJDEP GWQS and the Charles Wood Area background values.
- Glauconitic soils were noted in the test pits (**Attachment D**). These types of soils typically contain elevated levels of metals including arsenic and chromium (Dooley, 1998 and 2001; and Barringer, et al. 2014), which can contribute to elevated concentrations in groundwater.

The locations of GWQS exceedances are presented in **Attachment G**. Since the groundwater samples were collected with a bailer from temporary wells, sample turbidity is likely to be a cause of the elevated metal concentrations in groundwater. Furthermore, glauconitic soils were noted in the area, and therefore naturally-occurring elevated metals concentrations are also expected to contribute to the arsenic and chromium concentrations in groundwater.

The laboratory results from this investigation indicate that the groundwater was not impacted by the suspected fuel oil UST at former Building 2560.

### 1.3 ADDITIONAL MEASURES AT SUST-D

Additional measures are warranted to address the PCB in the soil and fill/debris encountered in the SUST-D test pit. One location with observations of fill with debris and slightly elevated PCBs in soil were encountered at the SUST-D test pit, as described in Section 1.2.2. Concrete rubble and electrical conduit were observed at approximately 5 to 5.5 ft bgs in this test pit, and PCBs were detected in soil at a concentration slightly above the RDCSRS. Additional action is warranted at this location, such as step-out soil sampling to delineate the PCB occurrence, or removal of the fill and post-excavation sampling of soil for PCBs. The additional measures will be planned and executed in conjunction with other FTMM environmental characterization and/or remediation activities and in coordination with NJDEP.

### 1.4 SUMMARY

In summary, we request No Further Action determinations for the Parcel 35 Septic Tank at Pool Area, and the Suspected Underground Storage Tank at Former Building 2560. Additional measures will be taken to address the PCB in soil and fill/debris encountered in the SUST-D test pit, as described in Section 1.3. The technical Point of Contact (POC) for this matter is Kent

Friesen at (732) 383-7201 or by email at kent.friesen@parsons.com. Should you have any questions or require additional information, please contact me by phone at (732) 380-7064 or by email at william.r.colvin18.civ@mail.mil.

Sincerely,

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

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

**REFERENCES CITED:** The sample was analyzed for PCBs and TPH. There were no exceedances of the RDCSRS for PCBs in the confirmation sample.


Army. 2013. *Finding of Suitability to Transfer (FOST), Fort Monmouth, New Jersey, Charles Wood Area.* August.

Barringer, J.L., Reilly, P.A., Eberl, D.D., Mumford, A.C., Benzel, W.M., Szabo, Zoltan, Shourds, J.L., and Young, L.Y. 2014. *Arsenic in New Jersey Coastal Plain streams, sediments, and shallow groundwater: Effects from different geologic sources and anthropogenic inputs on biogeochemical and physical mobilization processes.* U.S. Geological Survey Scientific Investigations Report 2013–5107, 38 p., http://dx.doi.org/10.3133/sir20135107.

Dooley, D.H. 2001. *Baseline Concentrations of Arsenic, Beryllium and Associated Elements in Glauconite and Glauconitic Soils in the New Jersey Coastal Plain*, New Jersey Department of Environmental Protection Division of Science, Research and Technology, Geological Survey.

Dooley, D.H. 1998. *Comprehensive Chemistry of Select Greensand from the New Jersey Coastal Plain.* New Jersey Geological Survey Technical Memorandum 98-1.

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

Parsons. 2014. *Final August 2013 Baseline Groundwater Sampling Report*. March.

United States (U.S.) Army Base Realignment and Closure (BRAC). 2008. *Site Investigation Report Fort Monmouth.* Final. July 21.

Weston. 1995. *Final Site Investigation - Main Post and Charles Wood Areas, Fort Monmouth, New Jersey.* December.

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Case Management
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BOB MARTIN
Commissioner

April 29, 2013

Joe Pearson
Calibre Systems
1119 Canterbury Dr.
Lansdale, PA 19446

Re: Draft Finding of Suitability to Transfer (FOST) dated March 2013
Charles Wood Area
Fort Monmouth, New Jersey
PI G000000032

Dear Mr. Pearson:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced document, submitted in support of the suitability for transfer of the bulk of Parcels B, C1, C, F, Howard Commons, and the Golf Course Parcel, the majority of which are contained within the property known as the Charles Wood Area. Parcel B is located on the western portion of the Main Post. The following comments are offered.

**Section 2. Property Description**
Page 2, paragraph 2, as you indicated on April 22, 2013, the reference to Area 400 is to be removed. Also on page 2, in the midpoint of paragraph 2, it is indicated the southeast corner of CWA was developed for R&D. Shouldn't this read south*west*?

**Section 4. Environmental Condition of Property**
*Parcel 28* – The narrative indicates some parts of this parcel remain a Category 7 (which are further explained in Section 5.2), or are not categorized. It does not appear the uncategorized area of Parcel 28 (the location of a former UST) is described anywhere within the document, nor is documentation regarding sampling of this area available; sampling is recommended. Additionally, former USTs 2542-29 and 2564-32, although referenced as no release or no contamination observed, were apparently not evaluated via sampling. Therefore, this office cannot concur with the determination there was no discharge in these areas. The Department recommends sampling in accordance with applicable NJDEP regulations and guidance documents.

*Parcel 35* – As indicated in previous (July 23, 2012) correspondence, it was determined Appendix O of the January 2007 ECP Report indicated the presence of a former UST as adjacent to Building 2560. As no evaluation of the UST has apparently been performed in accordance with applicable NJDEP regulations and guidance documents, the Department is unable to concur with the determination there was no discharge in the area of this UST, and is therefore unable to concur with the designation of Category 1 in the area of the UST.

*Parcel 36* –UST 1203 is listed in Enclosure 5, Table 3, page 6 as being removed on November 1, 2009. Although the Table states "no indication of release", the evaluation report does not appear to have been submitted. Therefore, the Department is unable to concur with the determination there was no discharge or designation of Category 1 in the area of this UST.

**Section 4.1.1 Installation Restoration Program**
*Golf Course PCB Site (CW-7) – FTMM-29 – page 9, third and fourth lines* – It is suggested the sentence beginning on line three be reworded to read similar to "A draft deed notice has been submitted to and approved by the NJDEP on January 31, 2013, and is to be filed once the property actually transfers." Regarding the fourth line, the NJDEP has not issued a Conditional NFA letter, but rather an approval of the draft deed notice, which is to be filed upon property transfer (followed by application for Remedial Action Permit).

**Section 4.3.1 Underground and Above-Ground Storage Tanks (UST/AST)**
*Reported Releases from USTs – page 13* – Building 2044 was listed in previous reports as a Pesticide Storage Building, rather than Residential. Building 2067 should be included, as Appendix G indicates results from the tank investigation initially exhibited TPH to 20,800 ppm in the soil, prior to receiving a Closure Approval designation on January 10, 2003.

**Section 4.4 Polychlorinated Biphenyls (PCB)**
*Officer's Club, Building 2000, Page 14* – The 0.049 and 2 milligrams per kilogram (mg/kg) referenced represent the Residential Direct Contact *Soil Cleanup Criteria* (RDCSCC) and Non-Residential Direct Contact *Soil Cleanup Criteria* (NRDCSCC). The approved draft Deed Notice will be *filed* once the property has been transferred.

**Section 5.1 Carve Out Areas Needing Further Remediation**
*Wastewater Treatment Lime Pit (CW-1) – FTMM-22 – page 23, 3rd paragraph, 2nd to last sentence* - The document seems to indicate the lime pit has been entirely removed during demolition activities. The base of the pit, however, I believe remains in place at this time.

**Enclosure 3, Table 1 – Description of Property**
*Parcel 28, page 3, Remedial Actions* – It is agreed ten former fuel oil USTs received designations of no further action necessary. As indicated in the February 22, 2013, correspondence, however, USTs 2564-32 and 2542-29, although reportedly evidencing no visual

contamination, do not appear to have been sampled; therefore, this office cannot concur with the designation of no discharge, nor concur with a Category 1 designation for the area of these two USTs. The Department believes sampling is necessary. Additionally, no mention is made nor description provided of the non-categorized area within the parcel shown in the Site Map in Enclosure 1; again, sampling is warranted.

*AAFES Gasoline Station (FTMM-58)- page 5* – Second to last sentence under the *Remedial Actions* column – "....are considered non-impacted and *are* part of this FOST and are considered a Category 1." The Category should read Category 2, rather than Category 1, correct? If this is not accurate, please provide the date of DEP concurrence.

*Child Development Center, Teen Center, Pool and Former Sewage Treatment Plant – page 5* – The septic tank in need of investigation, and which is not included in this FOST/transfer (carve-out), is not referenced under the Remedial Actions column, as carve-outs are in the other parcels. As noted, this office cannot concur with the designation of no discharge, nor concur with a Category 1 designation, relative to the area of the UST noted on Appendix O of the January 2007 ECP Report as adjacent to Building 2560, without evaluation in accordance with the applicable NJDEP regulations and guidance documents.

*Military Army Prep School and Offices – page 6* – The UST previously located at Building 1203 was reportedly removed on November 1, 2009. Although no evidence of a discharge was apparently evident, unless all tanks, former or current, have been evaluated in accordance with the applicable regulations and guidance documents (including submittal of documentation for review), the NJDEP cannot concur with the designation of no discharge, nor concur with a Category 1 designation for the area of the former UST.

**Enclosure 4, Table 2 – Notification of Hazardous Substance Storage, Release or Disposal**
*FTMM-29 (CW-7) – page 1 - Remedial Actions* – The fourth and fifth lines reference residential and industrial *screening* criteria. Please change the phrasing to read *cleanup* criteria rather than screening criteria.

*Building 2700 (ECP Parcel 15) – page 1*- does the former PCB transformer area not require inclusion on this table?

*2700 Meyer Center (FTMM-22 – CW-1) – page 2 – Remedial Actions* – first two words should read "Quality Standards", rather than "Quality Criteria". Line 14 – typo; "area" should read "are".

**Enclosure 5, Table 3 – Notification of Petroleum Product Storage, Release, or Disposal**
Former USTs 2542-29 and 2564-32, on Parcel 28, are listed as no release or contamination observed, however, no sampling was apparently performed. No report of evaluation was submitted for former UST UST-2544 on Parcel 28 (non-characterized area Enclosure 1), nor for UST-2560 on Parcel 35, which are not included on the Table, nor apparently for UST-1203 on Parcel 36. As previously indicated, without same, the Department is unable to concur with the determination that no discharge was associated with these USTs.

*Page 2 – Building 2067-37 – Date and Remedial Action* - Appendix G of the US Army BRAC 2005 ECP Final Report dated January 27, 2007 (Appendix G) indicates the UST, as well as contaminated soil, were removed on May 16, 1994; the NJDEP Closure Approval is dated January 10, 2003.

*Page 2 – Buildings 2231 through 2240 & Building 2260* – These buildings were contained within that portion of Parcel 35 previously transferred.

**Enclosure 8 Environmental Protection Provisions**

*1.A.2) Land Use Restriction* – third and fourth lines – change "Soil Remediation Standards" to "Soil Cleanup Criteria", as these were the criteria in effect at the time of remedial activities and approval.

**EPP Attachment 1**

*Site Maps – Land Use Restriction Map – Gibbs Hall Building 2000* – As above, the remediation numbers applicable to the area of concern at the time of remediation were the Residential and Non-Residential *Soil Cleanup Criteria*, rather than the Soil Remediation Standards. Please change line two of the figure's title (to reflect RDCSCC Limit = 0.49 mg/kg), as well as that within the parenthesis beneath the "Legend" box (to reflect "Area Outside of Proposed Deed Notice Boundary Meets NJDEP RDCSCC").

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

Linda S. Range

C: Wanda Green, BRAC Environmental Coordinator
Rich Harrison, FMERA
Julie Carver, Matrix

# Appendix B

# Public Press Release

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# PUBLIC NOTICE

***U.S. Army Corps of Engineers, NY District,*** **ACTION MEMORANDUM FOR PARCEL 35 at Fort Monmouth, NJ**

The U.S. Army Corps of Engineers New York District and the U.S. Army Engineering and Support Center, Huntsville (USAESCH), has prepared an *Action Memorandum* for Parcel 35 (Former Building 2560-Test Pit SUST-D) at Fort Monmouth (FTMM) in Oceanport, Monmouth County, New Jersey. The U.S. Army is the lead agency for FTMM in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Executive Order 12580. New Jersey Department of Environmental Protection (NJDEP) is the state support agency under the National Contingency Plan for FTMM.

The purpose of the Action Memorandum is to document the U.S. Army's decision to undertake the Time Critical Removal Action (TCRA) at Parcel 35 where polychlorinated biphenyl (PCB) contaminated soil was identified at former Building 2560-Test Pit SUST-D. This Action Memorandum describes the TCRA selected for and performed at Parcel 35. The New Jersey Department of Environmental Protection has concurred with the soil removal completed at Parcel 35.

The *Action Memorandum,* the associated reports, and the full public record for the Site, are available for review at the Monmouth County Library, Eastern Branch, 1001 Route 35, Shrewsbury NJ 07702. The *Action Memorandum* is also posted on the FTMM Environmental website (http://www.pica.army.mil/ftmonmouth/).

The New York District invites public comment on the *Action Memorandum*. Written comments will be accepted during a 30-day comment period starting March 27, 2018 and ending April 26, 2018. All comments must be postmarked by April 26, 2018, and mailed to the address below (or emailed by April 26, 2018 to william.r.colvin18.civ@mail.mil):

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OACSIM - U.S. Army Fort Monmouth
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