

U.S. Army Garrison
Fort Monmouth, New Jersey

**Unregulated Heating Oil Tank Remedial
Investigation and Closure Report**

ECP Parcel 51
Main Post – Bldg. 1123

NJDEP UST Registration No. 1123B & 1123C
NJDEP Spill No.: 09-09-1611-16/09-09-21-1213-31

June 2011

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

**ECP PARCEL 51
MAIN POST – BLDG. 1123
NJDEP UST REGISTRATION NO.: 1123B & 1123C
NJDEP SPILL NO.: 09-09-1611-16/09-09-1213-13**

JUNE 2011

PREPARED FOR:

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EXECUTIVE SUMMARY

Parcel 51 is located in the central portion of the Main Post and encompasses the 500 Area, 600 Area, 750 Area, and 1100 Area former buildings. Plan No. 506, "Gas and Fuel Storage Tanks Distribution System" dated January 22, 1956, was reviewed for the Main Post as part of the Phase I Environmental Condition of Property (ECP). The plan depicts numerous fuel oil UHOTs that existed within Parcel 51 in 1956 in association with the former buildings.

Numerous UHOTs associated with former and current buildings within the 500, 600, and 1100 Area have been removed under the FTMM UST program and are summarized within the FTMM Phase I ECP Report. A review of documented UST removal locations versus the location of former buildings within ECP Parcel 51 was conducted.

Based on this review, it was determined that no UHOT removals have been documented at the locations of numerous former buildings within Parcel 51 throughout the 750 Area (current motor pool), within the northern portion of the 1100 Area, and around the east and south perimeter of the 600 Area. At the time of the generation of the FTMM Phase II ECP Report, a soil investigation and remedial action was recently conducted in portions of the 400, 700, and 800 Bldg areas. The only portion of Parcel 51 that was included within this investigation was the southwestern corner of the parcel associated with Bldgs 787, 788, and 789.

In order to determine the absence/presence of formerly utilized UHOTs and the potential release from the UHOTs, geophysical surveys, soil sampling, and groundwater sampling were conducted throughout the 750 Area (current motor pool), within the northern portion of the 1100 Area, and around the east and south perimeter of the 600 Area.

An electromagnetic (EM) survey was conducted throughout the three identified former buildings areas to determine if UHOTs were present. Follow-up ground penetrating radar (GPR) surveys were conducted at anomalies identified from the EM surveys. The Geophysical investigation was performed by Enviroscan. The entire geophysical report can be found as an appendix to the ECP Phase II.

The EM survey identified a total of 74 targeted EM anomalies in the part of the 750 area and several anomalies in the vicinity of 1123. The area was scanned with the EM-61 because of a large amount of surface metal, and the parking lots which comprise most of the area could only be cordoned off in small portions. The EM-61 towing rig was better suited for the necessary tight turns. Several areas in this parcel were scanned with the TW-6 only due to interference of the GPR signal by nearby buildings and trees and the presence of parked cars during the EM survey.

No anomalies indicative of UHOTs were located within the TW-6 scanning areas. Targets located on the asphalt-covered portions within the 750 Area could not be scanned with the TW-6 due to suspected high metal content fill material; therefore, only GPR was utilized in these areas.

Geoprobe[®] soil samples were collected in October and November 2007, and groundwater samples were collected in November 2007 in Parcel 51 in order to investigate potential releases from historic USTs associated with the former 600, 750, and 1100 Area buildings. A total of 122 surface soils and 136 subsurface soil (including 12 duplicate samples) were collected from 122 distinct Geoprobe[®] borings. Soil boring locations were conducted on 100-ft centers. Surface soil samples for non-Volatile Organic (VOC) analysis were collected from the 0- to 6-inch interval bgs. For borings located in paved areas, non-VOC surface soil samples were collected from the 0- to 6- inch interval directly below the pavement sub-base.

Surface soil samples collected for VOC analysis were collected from the 18- to 24-inch bgs interval. Subsurface soil samples were collected from the 6-inch interval directly above the water table from each boring. Due to high water table conditions encountered at three boring locations, subsurface soil samples were collected from the 18- to 24-inch bgs interval. No additional VOC sample was collected as the sample interval coincided with the 18- to 24-inch surface soil VOC sampling interval.

Field screening of the soil boring cores was conducted using a PID and FID meter. Two additional soil samples were collected based on elevated results from field screening tests. A total of 26 groundwater samples (including four duplicate samples) were collected from 22 distinct temporary wells. Temporary wells were installed along the downgradient boundaries of the soil boring grids and were constructed of PVC with a minimum of 5 ft of factory-slotted screen (0.01mm).

Surface and subsurface soil samples were analyzed for Total Petroleum Hydrocarbons (TPHC). Corresponding surface and subsurface soil samples were collected for contingent volatile organic compound (VOC) +10 analyses. Groundwater samples were analyzed for VOC+10 and Base/Neutral+15 (B/N+15).

In addition to the subsurface soil samples collected from the interval directly above the water table, two supplementary subsurface soil samples were collected for TPHC and contingent VO analysis based on elevated field screening measurements. TPHC was detected in 41 of the 122 surface soil samples and in 18 of the 137 subsurface soil samples. A total of six subsurface soil samples contained TPHC at concentrations greater than 1,000 mg/kg, and VOC analysis was conducted. No VOCs or TPHC were detected in soil above the NJDEP Non-Residential Direct Contact Soil Clean-up Criteria (NRDCSCC).

A total of 11 VOCs were detected at concentrations below NJDEP Groundwater Quality Standard (GWQS) in groundwater samples collected from temporary wells at Parcel 51. A total of eight B/Ns were detected in Parcel 51 groundwater samples.

Bis([2-ethylhexyl]phthalate) was detected at a concentration exceeding the NJDEP GWQC of 3.0 µg/L in three groundwater samples. Bis([2-ethylhexyl]phthalate) is present in a wide variety of plastic products, is commonly detected in field and laboratory QC samples, and was detected in the field blank associated with the Parcel 51 groundwater samples. Therefore, it is not considered a COC in groundwater at Parcel 51.

Eleven suspected UHOTs were identified during the geophysical survey. No constituents were identified above applicable NJDEP criteria in surface or subsurface soil. Soil and analytical results suggest that a release has not occurred. In light of the absence of evidence of a release to the environment, NFA for soil and the suspected UHOTs in Parcel 51 is recommended. One COC, 2-methylnaphthalene, was detected in groundwater above the NJDEP GWQS. Further evaluation of 2-methylnaphthalene in groundwater is recommended. The 2-methylnaphthalene was detected in a well but the well is not located in the vicinity of Bldg. 750 and as such will not be addressed in this report.

In June of 2009, Fort Monmouth's Base Operations Contractor, TECOM-Vinnell Services (TVS), using the information developed in the Environmental Condition of Property (ECP) Phase II, began to investigate the area just to the north of Building 750 (motor pool) for the presence of potential unregulated heating oil tanks (UHOTs) as indicated by the geophysical survey conducted earlier by Enviroscan (The geophysical subcontractor responsible for the Geophysical findings in the EPC Phase II). The UHOTs located at Bldg. 750 are addressed under separate cover.

The areas where the potential UHOTs had been were marked out and based up the data from the geophysical report as series of test trenches were excavated in an attempt to locate the buried UHOTs. The suspected UHOT locations were gridded out and based upon the GPS locations test trenches were excavated.

Tanks 1123B & 1123C were found in the locations identified by the geophysical survey and removed in accordance with established protocol, discharges were noted, reported to the US Army and in turn they were called into NJDEP. In all cases post excavation samples were collected after the removal of visibly petroleum impacted soils.

Following receipt of all post-excitation soil sampling analytical results, each excavation was backfilled to grade with a combination of uncontaminated excavated soil and/or crushed stone. The excavation site was then restored to its original condition with four inches of top soil and grass seed.

Ground water was not encountered in either excavation and no impact to groundwater was anticipated due to the high content of glauconitic clay.

Analytical data from the post excavation samples demonstrated that there were no compounds in excess of the total organic compound values for soil quality standards.

1.0 Underground Storage Tank Decommissioning Activities

1.1 Overview

In June of 2009, Fort Monmouth's Base Operations Contractor, TECOM-Vinnell Services (TVS), using the information developed in the Environmental Condition of Property (ECP) Phase II, began to investigate the area just to the north of Building 750 (motor pool) for the presence of potential unregulated heating oil tanks (UHOTs) as indicated by the geophysical survey conducted earlier by Enviroscan (The geophysical subcontractor responsible for the Geophysical findings in the EPC Phase II).

The areas where the potential UHOTs had been were marked out and based up the data from the geophysical report as series of test trenches were excavated in an attempt to locate the buried UHOTs. At Building 1123, two potential anomalies were identified. The suspected UHOT locations were gridded out and based upon the GPS locations test trenches were excavated.

On September 16-22, 2009, two-single wall steel unregulated heating oil tanks (UHOTs) were located and subsequently closed by removal in accordance with the Directorate of Public Works (DPW) UST Management Plan for the U.S. Army Garrison, Fort Monmouth, New Jersey. The UHOTs were located in the grass medium directly behind Building 1123 as indicated by the geophysical investigation.

UHOT No. 1123B was a 1,000-gallon No. 2 heating oil tank. 1123B was the first of the two (2) UHOTs to be found and subsequently removed in this area. The fill port, vent pipe and associated supply/return piping were not present in the excavation. Both tanks were deep in the ground with the tops of the tanks found at five (5) below ground surface.

The site assessment was performed by TECOM-Vinnell Services (TVS) personnel in accordance with the New Jersey Department of Environmental Protection (NJDEP) *Technical Requirements for Site Remediation* (N.J.A.C. 7:26E) and the NJDEP *Field Sampling Procedures Manual*. Soils surrounding the tanks were screened visually and with a calibrated hand held Mini-Rae[®] Photo-Ionization air monitoring instrument for evidence of contamination. Following removal, the UST was inspected for holes. Holes were noted in the UHOT and potentially contaminated soils were observed surrounding the tank.

All sampling was performed by a NJDEP Certified Subsurface Evaluator according to the methods described in the NJDEP *Field Sampling Procedures Manual* (August 2005 edition- updated 15 February 2008). Sampling frequency and parameters analyzed complied with the NJDEP document *Technical*

Requirements for Site Remediation, 7:26E-3.9 (December 17, 2007 and revisions dated June 2, 2008) which was the applicable regulation at the date of the closure.

UHOTs 1123B & 1123C were removed in accordance with established protocol, discharges were noted at the following tank removal locations; upon the investigation of the UHOT (1123B), several holes were noted and approximately 12 cubic yards of petroleum impacted soils were removed from the excavation. Following the removal of the second UHOT (1123C) several holes were noted in the exterior and approximately 25 cubic yards of petroleum impacted soils were removed to the soil staging area at Bldg. 108.

Groundwater was not observed in either of the excavations. No groundwater sample was warranted or required.

Following receipt of all post-excavation soil sampling Total Petroleum Hydrocarbon (TPH) results, the excavations were backfilled to grade with a combination of uncontaminated excavated soil and crushed stone. The excavation sites were then restored to its original condition with four inches of asphalt and/or top soil and grass seed.

Based on the post-excavation soil sampling results, soils present are below the NJDEP health based criteria for total organic compounds and as such there are no detected semi-volatile organic compounds (SVOCs) exceeding the NJDEP Residential Direct Contact Soil Cleanup Standards.

Decommissioning activities for the UHOTs complied with all applicable federal, state, and local laws and ordinances in effect at the date of decommissioning. These laws included, but were not limited to: N.J.A.C. 7:14B-1 et seq., N.J.A.C. 5:23-1 et seq., and Occupational Safety and Health Administration (OSHA) 1910.146 & 1910.120. The closure and subsurface evaluation of the UHOTs were conducted by a NJDEP licensed US ARMY employee.

This UST Closure and Remedial Investigation Report (RIR) has been prepared by TVS to assist the US Army Garrison DPW in complying with the NJDEP - Underground Storage Tanks (USTs) regulations. The applicable NJDEP regulations at the date of closure were the *Closure of Underground Storage Tank Systems* (N.J.A.C. 7:14B-9 et seq. December, 1987 and revisions dated April 20, 2003).

This report was prepared using information required by the Technical Requirements for Site Remediation (N.J.A.C. 7:26E) (Technical Requirements). Section 1 provides a summary of the UHOT decommissioning activities. Section 2 describes the site investigation activities. Conclusions and recommendations, including the results of the soil sampling investigation, are presented in Section 3 of this report.

1.2 SITE DESCRIPTION

Building 1123 is located in the central portion of the Main Post area of Fort Monmouth, as shown on Figure 1. The UHOTs were located to the South of Building 1123. The areas to the immediate north of the structure are two landfill areas which are not addressed or are a part of this document. The physical location of Building 1123 and its surrounding environs can be found on Figure 2.

The fill ports and appurtenant piping were not encountered in the excavations during the tank removal phase. The piping was removed prior to the excavation of the tanks during the demolition of the previous structures. A site map is provided as Figure 2.

1.2.1 Geological/Hydrogeological Setting

The following is a description of the geological/hydrogeological setting of the Bldg. 1123. Included is a description of the regional geology of the area surrounding Fort Monmouth as well as descriptions of the local geology and hydrogeology of the Main Post area.

Fort Monmouth lies within the Outer Coastal Plain subprovince of the New Jersey section of the Atlantic Coastal Plain physiographic province, which generally consists of a seaward-dipping wedge of unconsolidated sediments including interbedded clay, silt, sand, and gravel. To the northwest is the boundary between the Outer and Inner Coastal Plains, marked by a line of hills extending southwest, from the Atlantic Highlands overlooking Sandy Hook Bay, to a point southeast of Freehold, New Jersey, and then across the state to the Delaware Bay. These formations of clay, silt, sand, and gravel formations were deposited on Precambrian and lower Paleozoic rocks and typically strike northeast-southwest, with a dip that ranges from 10 – 60 feet per mile. Coastal Plain sediments date from the Cretaceous through the Quaternary Periods and are predominantly derived from deltaic, shallow marine, and continental shelf environments.

The property is located within the outer fringe of the Atlantic Coastal Plain Physiographic Province, of New Jersey, approximately 20 miles south of Raritan Bay. This province is characterized by a wedge-shaped mass of unconsolidated to semi-consolidated marine, marginal marine and non-marine deposits of clay, silt, sand, and gravel. These sediments range in age from Cretaceous to Holocene and lie unconformably on pre-Cretaceous bedrock consisting of metamorphic schists and gneiss, with local occurrences of basalts, sandstone, and shale (Zapecza, 1984). These sediments trend northeast-southwest and dip southeast toward the Atlantic Ocean. These sediments thicken southeastward from the Piedmont-Coastal Plain Province boundary to approximately 4,500 feet near Atlantic City, New Jersey. During the Cretaceous and Tertiary time period, sediments were deposited alternately in flood plains and in marine environments during sea transgression and sea regression periods. The formations record several major transgressive/regressive cycles and contain units that are generally thicker to the southeast and reflect a deeper water environment.

Over 20 regional geologic units are present within the sediments of the Coastal Plain. Regressive, upward coarsening deposits are usually aquifers (e.g., Englishtown and Kirkwood Formations, and the Cohansey Sand) while the transgressive deposits act as confining units (e.g., the Merchantville, Marshalltown, and Navesink Formations).

Regressive upward coarsening deposits, such as Englishtown and Kirkwood Formations and the Cohansey Sand are usually aquifers, while transgressive deposits, such as the Merchantville, Marshalltown, and Navesink Formations, act as confining units. The thicknesses of these units vary greatly, ranging from several feet to several hundred feet, and thicken to the southeast.

The eastern half of the Main Post is underlain by the Red Bank Formation, ranging in thickness from 20-30 feet, while the western half is underlain by the Homerstown Formation, ranging in thickness from 20-30 feet. Sand and gravel deposited in recent geologic times lie above these formations. Interbedded sequences of clay serve as semi-confining units for groundwater. The mineralogy ranges from quartz to glauconite.

Udorthents-Urban land is the primary classification of soils on Fort Monmouth, which have been modified by excavating or filling. Soils at the Main Post include Freehold sandy loam, Downer sandy loam, and Kresson loam. Freehold and Downer are somewhat well drained, while Kresson is a poorly drained soil. The Charles Wood Area has sandy loams of the Freehold, Shrewsbury, and Holmdel types. Shrewsbury is a hydric soil; Kresson and Holmdel are hydric due to inclusions of Shrewsbury. Downer is not generally hydric, but can be.

Local Geology

Fort Monmouth lies in the Atlantic and Eastern Gulf Coastal Plain groundwater region and is underlain by underformed, unconsolidated to semi-consolidated sedimentary deposits. The chemistry of the water near the surface is variable with generally low dissolved solids and high iron concentrations. In areas underlain by glauconitic sediments, the water chemistry is dominated by calcium, magnesium, and iron (e.g. Red Bank and Tinton sands). The sediments in the vicinity of Fort Monmouth were deposited in fluvial-deltaic to nearshore environments. The water table is generally shallow (ranging in depth from 3 – 12') and in certain areas fluctuates with the tidal action in Parkers and Oceanport creeks at the Main Post.

Based on the regional geologic map (Jablonski, 1968), the Cretaceous age Red Bank and Tinton Sands outcrop at the Main Post area. The Red Bank sand conformably overlies the Navesink Formation and dips to the southeast at 35 feet per mile.

The upper member (Shrewsbury) of the Red Bank sand is a yellowish-gray to reddish brown clayey, medium- to coarse-grained sand that contains abundant rock fragments, minor mica and glauconite. The lower member (Sandy Hook) is a dark gray to black, medium-to-fine grained sand with abundant clay, mica, and glauconite.

The Tinton sand conformably overlies the Red Bank Sand and ranges from a clayey medium to very coarse-grained feldspathic quartz and glauconite sand to a glauconitic coarse sand.

The color varies from dark yellowish orange or light brown to moderate brown and from light olive to grayish olive. Glauconite may constitute 60 to 80 percent of the sand fraction in the upper part of the unit (Minard, 1969). The upper part of the Tinton is often highly oxidized and iron oxide encrusted (Minard).

Hydrogeology

The water table aquifer in the Main Post area is identified as part of the "composite confining units", or minor aquifers. The minor aquifers include the Navesink formation, Red Bank Sand, Tinton Sand, Hornerstown Sand, Vincentown Formation, Manasquan Formation, Shark River Formation, Piney Point Formation, and the basal clay of the Kirkwood Formation. The Hornerstown Formation acts as an upper boundary of the Red Bank aquifer, but it might yield enough water within its outcrop to supply individual household needs. The Red Bank outcrops along the northern edges of the Installation, and contains two members, an upper sand member and a lower clayey sand member. The upper sand member functions as the aquifer and is probably present on some of the surface of the Main Post. The Hornerstown and Red Bank formations overlay the larger Wenonah-Mount Laurel aquifer.

The area of Bldg. 1123 is located approximately 400 feet southeast of Parkers Creek. Based on the Main Post groundwater model, groundwater in this section of the Main Post is flowing north toward Parkers Creek.

1.3 HEALTH AND SAFETY

Work site health and safety hazards were minimized during all decommissioning activities. All areas which posed a vapor hazard were monitored by a qualified individual utilizing a calibrated photo-ionization detector: Thermo Instruments Organic Vapor Monitor (OVM) – Model #580-B. The individual ascertained if the area was properly vented to render the area safe, as defined by OSHA. All work areas were properly vented to insure that there were no contaminants present in the breathing zone above applicable permissible exposure limits (PEL's).

1.4 REMOVAL OF UNREGULATED HEATING OIL TANK

1.4.1 General Procedures

- All underground utilities were marked out by the respective trade shops or utility contractor prior to excavation activities.
- All activities were carried out with high regard to safety and health and safeguarding of the environment.
- All excavated soils were visually examined and screened with an OVM for evidence of contamination. Any potentially contaminated soils were identified and logged during closure activities.
- An NJDEP certified Subsurface Evaluator was present during all closure and remediation activities.

1.4.2 Unregulated Heating Oil Tank Excavation

During decommissioning activities, surficial soil was carefully removed to expose the UHOTs. The tanks were emptied of all liquids prior to removal from the ground. Approximately 800 gallons of liquid was pumped out of the UHOTs by Lorco Petroleum Services, Inc. into a tank truck and transported to their NJDEP-approved petroleum recycling and disposal facility located in Elizabeth, New Jersey. See the bill of lading in Section C of this document.

After the UHOTs were removed from the excavations, they were staged on an impervious surface, labeled and examined for holes. Holes in the tank were observed during the inspection by the Subsurface Evaluator. Soils surrounding the UHOTs were screened visually and with an OVM for evidence of contamination. Soil staining and an odor of petroleum hydrocarbons were observed and approximately 40 yards of petroleum impacted soils were removed from the excavation. Post-excavation samples were collected after the tank inspection and the inspection of the excavation.

1.5 UNREGULATED HEATING OIL TANK DECOMMISSIONING AND DISPOSAL

Subsequent to disposal, the UHOTs were purged with air to remove residual vapors prior to cutting. A 4-foot by 3-foot access hole was made in each UHOT using a pneumatic ripper gun with a non-sparking bit. The USTs were cleaned first with rubber squeegees and then with adsorbent material broomed on the sidewalls and bottom. The adsorbent material was then drummed and subsequently placed into Fort Monmouth's 'Oil Spill Debris' roll-off container for proper disposal. The atmosphere in and around the tank was monitored using an OVM and an Oxygen/Lower Explosive Level (LEL) meter to ensure safe working conditions during cutting and cleaning activities.

The tanks were then transported by TVS to Red Bank Recycling, Auto Wreckers, Red Bank, NJ for disposal in compliance with all applicable regulations and laws. Refer to Appendix C for UHOT disposal certificate.

Any liquid content of the individual UHOTs discovered was pumped out and transported to the LORCO Petroleum Services facility in Elizabeth, NJ. Copies of the bills of lading can be found in Appendix B of this document.

The Subsurface Evaluator labeled the UHOT with the following information:

- Site of origin
- NJDEP UST Facility ID number
- Date of removal
- Size of tank
- Previous contents of tank

1.6 MANAGEMENT OF EXCAVATED SOILS

Overburden soils were used as fill materials. Clean bank run sands and/or crushed stone were used as fill material when additional soils were required at each of the individual UHOT excavations.

2.0 REMEDIAL INVESTIGATION ACTIVITIES

2.1 OVERVIEW

The Remedial Investigation was managed by U.S. Army DPW personnel. All analyses were performed and reported by Fort Monmouth Environmental Testing Laboratory (FTMEL), a NJDEP-certified testing laboratory. All sampling was performed by a NJDEP Certified Subsurface Evaluator according to the methods described in the NJDEP Field Sampling Procedures Manual (2005). Sampling frequency and parameters analyzed complied with the NJDEP document *Technical Requirements for Site Remediation, 7:26E-3.9* (December 17, 2007 and revisions dated June 2, 2008) which was the applicable regulation at the date of the closure. All records of the Remedial Investigation activities are maintained by the Fort Monmouth DPW Environmental Office.

The following Parties participated in Closure and Remedial Investigation Activities.

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Contact Person: Joseph Fallon
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- Subsurface Evaluator, Tank Closure: Frank Accorsi
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NJDEP License No.: 0010042
(TVS) NJDEP License No.: US252302
- Analytical Laboratory: Fort Monmouth Environmental Testing Laboratory (FTETL)
Contact Person: Dean Tardiff
Phone Number: (732) 532-4359
NJDEP Laboratory Certification No.: 13461
- Hazardous Waste Hauler: Lorco Petroleum Services, Inc., Elizabeth, NJ
Contact Person: Dan MacKay
Phone Number: (908) 820-8800
Manifest No.: NHZ-33887/33888
US EPA ID No.: NJR000023036

2.2 FIELD SCREENING/MONITORING

Field screening was performed by a NJDEP certified Subsurface Evaluator using an OVM and visual observations to identify potentially contaminated material. Soils were removed from the excavation surrounding the individual UHOTs until no evidence of contamination remained.

2.3 SOIL SAMPLING

The post-excavation soil sample results were compared to the NJDEP health based criterion of 4,800 mg/kg for total organic contaminants (December 17, 2007 and revisions dated June 2, 2008). Each excavation was over excavated to ensure TPH concentrations remaining would be below the 1,000 mg/kg contingency analytical threshold. A summary of the analytical results and comparison to the NJDEP soil cleanup standards are provided on Table 1 and Table 2. The soil analytical data packages, including associated quality control data, are provided in Appendix E.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 SOIL SAMPLING RESULTS

Post excavation samples were collected from the individual UIHOT excavations (1123B & 1123C) to evaluate soil conditions following removal of the UHOTs.

All samples were analyzed for TPH. The post-remediation soil sample results were compared to the NJDEP health based criterion of 5,100 mg/kg for total organic contaminants (December 17, 2007 and revisions dated June 2, 2008). A summary of the analytical results and comparison to the NJDEP soil cleanup criteria is provided on Table 2. The analytical data package, including associated quality control data, is provided in Appendix D.

3.2 CONCLUSIONS AND RECOMMENDATIONS

The analytical results for all of post-remediation soil samples collected from the closure excavation at UHOTs No. 1123 B & 1123 C were below the NJDEP soil cleanup standards for total organic contaminants and semi-volatile organic compounds. As part of Fort Monmouth's soil remediation program, soils are to be excavated to below 1,000 mg/kg. This ensures that the contingency analysis is not performed and eliminates any potential of chasing one of the surrogate fuel oil base/neutral compounds, thus reducing the volume soils excavated and cost of UHOT removals. No post remedial samples collected from the individual UHOT removals were in excess of the contingency value of 1,000 mg/kg necessary for additional base/neutral analysis.

The findings of glauconite sands and clays at the excavations coincide with lithological data at other borings and excavations post wide. A more detailed and in depth discussion of the underlying glauconite will be presented to NJDEP at a later time.

Based upon the analytical data from the post excavation samples for 1123B & 1123C, No Further Action (NFA) is proposed in regard to the closure and remedial investigation of UHOT No.1123B & 1123 C at Building 1123, ECP Parcel 51.

TABLE 1
SUMMARY OF LABORATORY ANALYSIS
FT. MONMOUTH, BUILDING 1123B & 1123C
September 2009

SAMPLE ID	LABORATORY SAMPLE ID	SAMPLE DATE	SAMPLE MATRIX	ANALYTICAL PARAMETER	ANALYTICAL METHOD
1123B PX1 Bottom	9038301	9/16/09	Soil	TPH	OQA-QAM-25
1123B PX2 South Wall	9038302	9/16/09	Soil	TPH	OQA-QAM-25
1123B PX3 East Wall	9038303	9/16/09	Soil	TPH	OQA-QAM-25
1123B PX4 West Wall	9038304	9/16/09	Soil	TPH	OQA-QAM-25
1123B PX5 North Wall	9038305	9/16/09	Soil	TPH	OQA-QAM-25
1123C PX1 North Wall	9038801	9/18/09	Soil	TPH	OQA-QAM-25
1123C PX2 South Wall	9038802	9/18/09	Soil	TPH	OQA-QAM-25
1123C PX3 East Wall	9038803	9/18/09	Soil	TPH	OQA-QAM-25
1123C PX4 West Wall	9038804	9/18/09	Soil	TPH	OQA-QAM-25
1123C PX5 Bottom	9038805	9/18/09	Soils	TPH	OQA-QAM-25
1123B PX6 East Wall	9038901	9/18/09	Soils	TPH	OQA-QAM-25
1123C PX 6 East Wall	9039501	9/22/09	Soils	TPH	OQA-QAM-25
1123C PX 7 West Wall	9039502	9/22/09	Soils	TPH	OQA-QAM-25

ABBREVIATIONS:

TPH = Total Petroleum Hydrocarbons, Method NJDEP OQA-QAM-25

TABLE 2
SUMMARY OF LABORATORY ANALYTICAL RESULTS
FT. MONMOUTH, BUILDING 1123B & 1123C, September 2009
TOTAL PETROLEUM HYDROCARBONS (results in mg/kg)

SAMPLE ID	LABORATORY SAMPLE ID	SAMPLE LOCATION	SAMPLE DEPTH (in feet)	MATRIX	TPH RESULTS
1123B PX1	9038301	Bottom	10-10.5'	Soil	912.49
1123B PX2	9038302	South Wall	8.5-90.'	Soil	ND
1123B PX3	9038303	East Wall	8.5-9.0'	Soil	9832.44
1123B PX4	9038304	West Wall	8.5-9.0'	Soil	430.84
1123B PX5	9038305	North Wall	8.5-9.0'	Soil	628.40
1123C PX1	9038801	North Wall	8.0-8.5'	Soil	ND
1123C PX2	9038802	South Wall	8.0-8.5'	Soil	322.72
1123C PX3	9038803	East Wall	8.0-8.5'	Soil	1526.93
1123C PX4	9038804	West Wall	8.0-8.5'	Soil	1532.25
1123C PX5	9038805	Bottom	9.0-9.5'	Soil	ND
1123B PX6	9038806	East Wall	8.5-9.0'	Soil	718.93
1123C PX6	9039501	East Wall	8.5-9.0	Soil	ND
1123C PX7	9039502	West Wall	8.5-9.0	Soil	ND

ABBREVIATIONS:

mg/kg = milligrams per kilogram = parts per million

ND = Compound Not Detected

FIGURES

APPENDIX A

CERTIFICATIONS

APPENDIX B

WASTE MANIFEST

APPENDIX C

UST DISPOSAL CERTIFICATE

APPENDIX D

PHOTO - DOCUMENTATION



UHOT at Bldg. 1123



UHOT removed from excavation



Historical discharge visible



Second UHOT removed from Bldg. 1123



Excavation of second UHOT, note staining in bottom left of photo



Completed remediation at I123

APPENDIX E

SOIL ANALYTICAL DATA PACKAGES

Bibliography

Roy F. Weston May 1994, *Underground Storage Tank System Piping Closure and Site Investigation Report Building 750*

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