FINAL

REMEDIAL INVESTIGATION / FEASIBILITY STUDY WORK PLAN FOR SITES FTMM-22, FTMM-53, FTMM-59, AND FTMM-68

FORT MONMOUTH, OCEANPORT, MONMOUTH COUNTY, NEW JERSEY

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Project Title:	**Remedial Investigation/Feasibility Study/Decision Documents, Fort Monmouth, Oceanport, Monmouth County, New Jersey**
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LIST OF ACRONYMS

ACRONYM	DEFINITION
°F	degrees Fahrenheit
µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
AMC	U.S. Fort Monmouth Material Command
amsl	above mean sea level
APP	Accident Prevention Plan
ARAR	applicable or relevant and appropriate requirement
AST	above-ground storage tanks
BEE	baseline ecological evaluation
bgs	below ground surface
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylenes
C4ISR	Command and Control Communications, Computers, Intelligence, Sensors and Reconnaissance
CD-ROM	compact disc
CECOM	U.S. Fort Monmouth Communications and Electronics Command
CENAE	U.S. Army Corps of Engineers New England District
CENAN	U.S. Army Corps of Engineers New York District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIP	common installation picture
CSDGM	Content Standards for Digital Geospatial Metadata
CSM	conceptual site model
CWA	Charles Wood Area
COPC	contaminant of potential concern
COPEC	chemical of potential ecological concern
CY	cubic yard(s)
CZMP	Coastal Zone Management Program
DCE	dichloroethene
DD	Decision Document
DERP	Defense Environmental Restoration Program
DID	data item description
DNAPL	dense non-aqueous phase liquid
DO	dissolved oxygen
DoD	Department of Defense
DPW	Department of Public Works
DQO	data quality objective
DVD-ROM	digital video disc
EA	Evans Area
ECP	Environmental Condition of Property
EM	engineering manual
ELAP	Environmental Laboratory Accreditation Program
EPH	extractable petroleum hydrocarbons

ACRONYM	DEFINITION
EPP	Environmental Protection Plan
ERPIMS	Environmental Resources Program Information Management System
ESC	ecological screening criteria
ESRI	Environmental Systems Research Institute
FFP	firm fixed price
FGDC	Federal Geographic Data Committee
FS	feasibility study
ft/day	feet per day
ft/ft	foot per foot
ft/yr	feet per year
FMERA	Fort Monmouth Economic Revitalization Authority
FTMM	Fort Monmouth
GC/MS	gas chromatography/mass spectroscopy
GES	Groundwater & Environmental Services, Inc.
GFP	government-furnished property
GIS	geographic information system
gpm	gallons per minute
GPS	global positioning system
GWQS	Ground Water Quality Standard(s)
GWSL	Ground Water Screening Level(s)
HTRW	hazardous, toxic, and radiological waste
IASLs	indoor air screening levels
IDW	investigation-derived waste
IRP	Installation Restoration Program
ISCO	in-situ chemical oxidation
LNAPL	light non-aqueous phase liquid
MDS	Mission Data Set
mg/kg	milligrams per kilogram
MNA	monitored natural attenuation
MP	Main Post
NAD83	North American Datum 1983
NCP	National Contingency Plan
NCR	nonconformance report
NFA	no further action
NJAC	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
ORP	oxidation-reduction potential
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PDA	personal digital assistant
PDF	portable document format
PID	photoionization detector

ACRONYM	DEFINITION
PgM	program manager
PM	project manager
PMP	Project Management Plan
POC	point of contact
PP	priority pollutant(s)
PPE	personal protective equipment
PWS	Performance Work Statement
QA	quality assurance
QASP	Quality Assurance Surveillance Plan
QC	quality control
QCP	Quality Control Plan
R&D	research and development
RAGS	Risk Assessment Guidance for Superfund
RAO	remedial action objective
RAPR	Remedial Action Progress Report
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RCWM	recovered chemical warfare materiel
RDBMS	Relational Database Management System
RDCSRS	Residential Direct Contact Soil Remediation Standard
RI/FS	remedial investigation/feasibility study
SAP	Sampling and Analysis Plan
SCC	soil cleanup criteria
SDSFIE	Spatial Data Standards for Facilities Infrastructure and Environment
SGSL	soil gas screening level
SI	site investigation
SSHO	Site Safety and Health Officer
SHSP	Site Health and Safety Plan
SVE	soil vapor extraction
SVOCs	semi-volatile organic compounds
TAL	target analyte list
TBA	tert-butyl alcohol
TCE	trichloroethene
TCL	target compound list
TICs	tentatively identified compounds
TO	task order
TPH	total petroleum hydrocarbons
UFP-QAPP	Uniform Federal Policy-Quality Assurance Project Plan
USACE	U.S. Army Corps of Engineers
USAEHA	U.S. Army Environmental Hygiene Agency
USAESCH	U.S. Army Engineering and Support Center, Huntsville
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency

ACRONYM	DEFINITION
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
VI	vapor intrusion
VOC	volatile organic compounds
WERS	Worldwide Environmental Restoration Services
Weston	Roy F. Weston, Inc.

SECTION 1
INTRODUCTION

1.1 PROJECT AUTHORIZATION

1.1.1 Parsons Government Services Inc. (Parsons) is serving as the prime contractor to the U.S. Army Engineering and Support Center, Huntsville (USAESCH) for the performance of a Remedial Investigation/Feasibility Study (RI/FS) to achieve acceptance of Decision Documents (DD) at the Fort Monmouth (FTMM) site in Oceanport, Monmouth County, New Jersey. This project is being performed under task order (TO) 0012 issued under the Worldwide Environmental Restoration Services (WERS) contract number W912DY-09-D-0062.

1.1.2 This TO was issued to address a number of environmental sites at FTMM that are in various stages of hazardous, toxic, and radiological waste (HTRW) investigation and remediation. Specific activities that will be performed under this delivery order include 1) performance of remedial investigations (RI) and feasibility studies (FS) to achieve acceptance of DDs in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Contingency Plan (NCP), 40 CFR Part 300 and to the extent possible to meet the requirements of New Jersey Administrative Code (N.J.A.C.) 7:26E Technical Requirements for Site Remediation, and 2) supporting the closure of environmental sites to facilitate the efficient transfer of real property to other parties.

1.1.3 This work plan, which describes RI/FS activities to be performed at sites FTMM-22, FTMM-53, FTMM-59, and FTMM-68, is to be executed in accordance with the Performance Work Statement (PWS) dated 30 August 2012 (**Appendix A**). Parsons will coordinate this effort with USAESCH, U.S. Army Corps of Engineers, New York District (CENAN), U.S. Army Corps of Engineers, New England District (CENAE), and FTMM. Project roles and responsibilities are outlined in the Project Management Plan (PMP) (Parsons 2012a). (U.S. Army Corp of Engineers [USACE] is defined as USAESCH, CENAN, CENAE.)

1.2 PURPOSE AND SCOPE

1.2.1 Parsons will perform RI/FS activities for FTMM-22 (former CW-1 Wastewater Treatment Lime Pit at Building 2700), FTMM-53 (Building 699/former gas station), FTMM-59 (Building 1122/former auto repair shop), and FTMM-68 (Building 700/former dry cleaners). The RI/FS for each site will address contaminants of potential concern (COPCs) detected during previous investigations. Supporting plans, including the Accident Prevention Plan (APP) which contains the Site Health and Safety Plan (SHSP) as **Appendix D,** and Sampling and Analysis Plan (SAP) as **Appendix E** have been prepared as stand-alone documents and are included in this work plan by reference only.

1.2.2 The work plan is a living document and may be updated via slip pages if warranted. Once this work plan is approved for implementation, a dated summary page listing revised pages will be used to document associated changes and will be included with each revision.

1.2.3 The primary objective and purpose of the RI/FS is to characterize contamination, identify and quantify associated risk(s), and provide documentation supporting necessary response action planning. Following completion of the field investigation phase, site-specific RI/FS reports will be prepared that characterizes the nature and extent of site-related

contamination, compile information to fill data gaps, evaluate the potential risk to human health and the environment, evaluate remedial alternatives, and document the recommended remedial alternative. The overall goal of this process is to obtain stakeholder concurrence on a final RI/FS report for each site, and if appropriate, provide sufficient data to facilitate the future remedial action. The objective of the RI/FS portion of this project will be met when the following tasks have been accomplished:

- A work plan has been prepared in accordance with the PWS that references governing regulations and requirements, identifies appropriate field work for the RI, and defines and presents an effective approach to the planning and implementation of field work that will meet the requirements of the RI/FS;
- An RI is completed that is sufficient to characterize the nature and extent of potential contamination risks; and
- An FS is completed, if contamination risks are anticipated, that identifies at least one appropriate, applicable, cost-effective, implementable remedy.

1.3 WORK PLAN ORGANIZATION

1.3.1 This work plan covers the investigation and associated preparatory activities necessary for RI/FS activities at four sites at FTMM. The work plan is organized to be compliant with relevant portions of Data Item Description (DID) WERS-001.01 (Explosives Management Plan, Interim Holding Facility Siting Plan for Recovered Chemical Warfare Materiel (RCWM) Projects, and Physical Security Plan for RCWM Project Sites). The work plan comprises several sub plans, each discussing a different aspect of the RI/FS and is summarized below. Sections 5, 8, and 9 of WERS-001.01 are not applicable to this project, and therefore are not included in this work plan.

- Introduction: Section 1 details the overall scope and objective of the project, presents the organization of the work plan, and presents an overview of the site and its history, including previous investigations and historical data;
- Technical Management Plan: Section 2 details the organizational structure, lines of authority, and communication of the project team. Given that much of the information in this section is also included in the PMP prepared under separate cover, the PMP is referenced where appropriate to avoid duplication of effort;
- Field Investigation Plan: Section 3 describes the specific RI field activities planned for the sites and the approach to the evaluation of remedial technologies and alternatives;
- Quality Control Plan (QCP): Section 4 summarizes Parsons' procedures for controlling and measuring the quality of work performed, including the organization, responsibilities, and policies. Additional information is included in the Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) prepared as part of the SAP and included by reference as **Appendix E**;
- Environmental Protection Plan (EPP): Section 5 describes the procedures and methods to be implemented to minimize pollution; protect and conserve natural, cultural, archaeological, and water resources; restore damage; and control noise and dust within reasonable limits;

- Property Management Plan: Section 6, Property Management Plan, describes how Parsons will manage Government Furnished Property (GFP); and
- References: Section 7, References, includes a list of references used in the preparation of this work plan.

1.3.2 Additional information is attached to this work plan as appendices (some of which are included by reference as indicated below):

- **Appendix A** – Performance Work Statement;
- **Appendix B** – Field Forms: Relevant field forms that will be used by the sampling team is provided in the SAP Appendix B (included by reference only);
- **Appendix C** – Historical Information: Selected tables and figures from historical reports that illustrate previously-collected site characterization information;
- **Appendix D** – APP (included by reference only); and
- **Appendix E** – SAP (included by reference only).

1.4 PROJECT LOCATION

FTMM is located in the central-eastern portion of New Jersey in Monmouth County, approximately 45 miles south of New York City, New York, 70 miles northeast of Philadelphia, Pennsylvania, and 40 miles east of Trenton, New Jersey. The Atlantic Ocean is approximately 3 miles to the east. The location of FTMM and the four sites discussed in this work plan are shown on **Figures 1.1 through 1.3**.

1.5 SITE DESCRIPTION

1.5.1 Site Location

1.5.1.1 FTMM occupies approximately 1,126 acres and was comprised of three areas: the Main Post (MP), the Charles Wood Area (CWA) and the Evans Area (EA). The EA was located approximately 8 miles to the south of the MP and CWA and was formerly used for administrative, research and development (R&D), and some training. The EA was closed under Base Realignment and Closure (BRAC) 1998 and all but 2 acres have been transferred from FTMM. FTMM falls within the Boroughs of Eatontown, Oceanport, and Tinton Falls. The MP is in the Eatontown and Oceanport Boroughs. The 489-acre CWA is in the Eatontown and Tinton Falls Boroughs.

1.5.1.2 FTMM-22, also known as the CW-1 Wastewater Treatment Lime Pit, is located in the courtyard of Building 2700 in the western portion of the CWA (**Figure 1.4**). The site encompasses a former lime pit that was used to pre-treat acidic liquid wastes produced in the laboratories in Building 2700.

1.5.1.3 FTMM-53 encompasses Building 699 in the central portion of the MP. This building served as a filling station and consisted of associated fuel storage tanks, underground piping, and gasoline dispensing islands (**Figure 1.5**).

1.5.1.4 FTMM-59 is associated with Building 1122 in the MP and housed a modern "do-it-yourself" auto repair shop (**Figure 1.6**).

1.5.1.5 FTMM-68 encompasses Building 700 in the central portion of the MP, and is a former dry cleaning facility that used chlorinated solvents (tetrachloroethene [PCE] and trichloroethene [TCE]). FTMM-68 is located immediately adjacent to (east of) FTMM-53 (**Figure 1.7**).

1.5.2 Physiography, Topography, and Vegetation

1.5.2.1 Both the MP and CWA are located within New Jersey's Coastal Plains Physiographic Province, which is comprised of sedimentary beds that gently dip to the southeast. The Coastal Plains Physiographic Province sedimentary beds are dissected by meandering rivers that drain to the Raritan or Delaware River. The topography of the installation is relatively flat, and has an elevation of 20 to 25 feet above mean sea level (amsl) (AECOM, 2012).

1.5.2.2 Major vegetation zones at FTMM consist of landscaped areas, estuarine and fresh water wetlands, riparian areas, upland forests, and old field habitats. Much of the upland areas of the MP and CWA consist of extensive areas of regularly mowed lawns and landscaped areas. The vegetation information summarized in the following paragraphs is primarily from the Baseline Ecological Evaluation Report (Shaw, 2011).

1.5.2.3 Areas of wetlands are present on both the MP and CWA. Estuarine wetlands on the MP are associated with the tidal brackish waters of Parkers and Oceanport Creeks. Where present on the MP, estuarine wetlands are dominated by common reed and phragmites. Freshwater wetlands occur on both the MP and CWA. The most extensive of these are forested wetlands, with areas of emergent wetlands associated with the fresh water portions of the several creeks that traverse the MP and CWA. Forested wetlands in the area are typically dominated by red maple (Acer rubrum) and other hardwoods, including sweetgum (*Liquidambar styraciflua*) and black gum (*Nyssa sylvatica*). Shrubs/vines include arrowwood (*Viburnum dentatum*), coastal sweet pepperbush (*Clethra alnifolia*), and greenbrier (*Smilax rotundifolia*). Herbaceous species found in these forested wetlands include smartweed (*Polygonum sp.*), jewelweed (*Impatiens capensis*), violets (*Viola sp.*), asters, sedges and ferns. Fresh water emergent vegetation includes cattail (*Typha latifolia*), water smartweed (*Polygonum amphibium*), arrowhead (*Sagittaria sp.*), pondweed (*Potamogeton sp.*), sedges, and rushes.

1.5.2.4 In many areas of the MP steep banks along the creeks limit the extent of the riparian zone and thereby prevent the formation of extensive wetlands. These areas have a narrow riparian zone dominated by marsh elder, also known as high-tide bush.

1.5.2.5 Although most upland areas of the MP and CWA are developed, patches of upland forest are present in several areas. Dominant tree species include red oak (*Quercus rubra*), chestnut oak (*Quercus prinus*), tuliptree (*Liriodendron tulipifera*), and sweetgum (*Liquidambar styraciflua*). Understory species include sassafras (*Sassafras albidum*), flowering dogwood (*Cornus florida*), and black cherry (*Prunus serotina*).

1.5.2.6 Old field habitats include formerly mowed areas where the vegetation includes grasses and forbes and often immature trees. Old field habitat at the MP includes grasses, many forbes including Queen Ann's lace (*Daucus carota*), pokeweed (*Phytolacca americana*), goldenrod (*Solidago sp.*), milkweed (*Asclepias syriaca*), and sparse saplings of tree species including eastern red cedar (*Juniperus virginiana*) and winged sumac (*Rhus copallinum*).

1.5.3 Climate

The climate in the Fort Monmouth area is typically humid subtropical and is impacted by continental and oceanic influences. The proximity of the Atlantic Ocean tends to minimize seasonal temperature fluctuations as compared to interior regions of the state. Based on data obtained from the National Weather Service, the temperature at Fort Monmouth ranges from 20 degrees Fahrenheit (^{o}F) to 90^{o}F (average of 57^{o}F), and precipitation averages 42 inches per year. Winter is typically cold with occasional Nor'easters, resulting in rain along the coast; springs are mild, with the average temperature in the 50s and common thunderstorms; summers are hot and humid, with rare hurricanes; and autumns are similar to spring in terms of temperature and precipitation, although unpredictable weather is common (AECOM, 2012).

1.5.4 Geology and Hydrogeology

1.5.4.0.1 The MP and CWA are situated on Coastal Plain deposits that thicken to the southeast. A regional geologic cross-section for the FTMM vicinity is provided in **Appendix C-1**. This cross-section was obtained from an RI report for FTMM-59 prepared by Versar (2005). This cross-section indicates that the depth to bedrock at FTMM is approximately 1,000 feet. Versar (2005) states that more than 20 regional geologic units are present within the sediments of the Coastal Plain. Regressive, upward coarsening deposits are usually aquifers (e.g., Englishtown and Kirkwood Formations and the Cohansey Sand), while the transgressive deposits act as confining units (e.g., the Merchantville, Marshalltown and Navesink Formations). The individual thickness for these units varies greatly from several feet to several hundred feet.

1.5.4.0.2 Based on a regional geologic map prepared by Jablonski (1968) and presented in the RI Report (Versar 2005), the Cretaceous age Red Bank and Tinton Sands (both unconsolidated) outcrop at the Main Post. The Red Bank Sand conformably overlies the unconsolidated 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 (Versar, 2005).

1.5.4.0.3 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. The upper part of the Tinton Sand is often highly oxidized and iron oxide encrusted (Versar, 2005).

1.5.4.0.4 The water-table aquifer in the MP area is identified as part of the "Navesink-Hornerstown 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. These geologic formations comprise a "Composite Confining Bed" for the underlying Wenonah Mount Laurel Aquifer (Zapecza, 1984 as reported by Versar, 2005) (see regional geologic cross-section in **Appendix C-1**). Wells installed in the Red Bank and Tinton Sands produce 2 to 25 gallons per minute (gpm) (Jablonski, 1968). The shallow water-table conditions in the Tinton and Red Bank Sands, and the similar composition of these sands within

the Kirkwood Formation, suggest that the Tinton-Red Bank-Kirkwood sequence forms a single, laterally continuous aquifer. Groundwater in this water-table aquifer flows east towards the Atlantic Ocean. However, local topography tends to deflect the flow toward local depressions (Versar, 2005).

1.5.4.0.5 Groundwater is typically encountered at the MP and in the surrounding areas at shallow depths 2 to 9 feet bgs (feet below ground surface); groundwater elevations fluctuate with the tidal action in area creeks (AECOM, 2012). A pumping test performed at FTMM in 1992 yielded a hydraulic conductivity of 32 gallons per day per square foot (4.3 feet per day [ft/day]) (Groundwater & Environmental Services, Inc. [GES] 1999). The location of the pumping test and the geologic unit tested are not known. Additional hydraulic conductivity information for the MP area is provided in Appendix IV of the *MODFLOW Groundwater Modeling* report prepared by Brinkerhoff Environmental Services, Inc. (2010). A table summarizing this additional hydraulic conductivity information is provided in **Appendix C-1**. Twenty-one hydraulic conductivity values derived from slug tests performed in monitoring wells installed at various building areas ranged from 0.3 ft/day to 31.7 ft/day with an average value of 5.3 ft/day.

1.5.4.0.6 Shallow groundwater in the MP area is locally influenced by the following factors (GES, 1999):

- Tides (based on proximity to the Atlantic Ocean, rivers and tributaries),
- Topography,
- Nature of the fill material within the MP area,
- Presence of clay and silt lenses in the natural overburden deposits, and
- Local groundwater recharge areas (e.g., streams, lakes)

Due to the fluvial nature of the overburden deposits (e.g., sand and clay lenses), GES (1999) concluded that shallow groundwater flow direction is best determined on a case-by-case basis.

1.5.4.0.7 The chemistry of the groundwater near the surface is variable with low dissolved solids and high iron concentrations. The water chemistry in areas underlain by glauconitic sediments (such as Red Bank and Tinton Sands) is dominated by calcium, magnesium, and iron (Shaw, 2011). Glauconitic soils, such as those present in the Cretaceous Age Red Bank and Tinton Sands of the FTMM area, can exhibit high concentrations of naturally-occurring metals such as arsenic, beryllium, and lead (Dooley, 2001), and the upper part of the Tinton Sand is often highly iron-oxide encrusted.

1.5.4.0.8 NJAC 7:9C, *Ground Water Quality Standards* (GWQS), establishes groundwater quality criteria for different classes of groundwater. Class II-A, which is defined as groundwater that is not classified as one of the other special classes, is the appropriate class for groundwater at FTMM. The primary designated use for Class II-A groundwater is potable water; secondary uses include agricultural and industrial water.

1.5.4.1 FTMM-22 (Former CW-1 Lime Pit at Building 2700)

1.5.4.1.1 Subsurface materials at FTMM-22 consist of unconsolidated, generally well compacted, stratified, glauconitic, silty sand with laterally discontinuous, alternating clay and silt lenses. The stratigraphy from approximately 18 to 25 feet bgs is silty to clayey fine sand, and may represent a semi-confining unit, separating predominantly sand units above 18 feet and

below 25 feet. A silt unit that is at least 9 feet thick begins at 41 feet bgs (GES, 2001). Unconsolidated deposits encountered during advancement of soil borings in 1999 consisted of light brown to orange-brown, fine to medium sand with minor amounts of fine-grained material from the ground surface to approximately 18 feet bgs. Orange, fine to medium sand with increased silt and clay content was encountered below 18 feet.

1.5.4.1.2 The depth to water in the FTMM-22 area is approximately 8 feet bgs. Groundwater flow in the shallow (water-table to approximately 18 feet bgs) and deep (approximately 25 to 41 feet bgs) water-bearing zones is typically toward the east to southeast towards Shrewsbury Creek (GES, 2001; see potentiometric surface maps in **Appendix C-2**). In 2005 and 2006 there was a localized groundwater mound in the shallow water-bearing zone that was centered just north of the former lime pit at well CW1-MW028. This mound was likely due to operation of the air sparging and soil vapor extraction (SVE) systems in this area; these systems are now shut down. In August 2000, the hydraulic gradient in the shallow zone ranged from 0.005 to 0.008 foot per foot (ft/ft), and the gradient in the deep zone was 0.005 ft/ft (GES, 2001). Groundwater in the area is within a Class IIA aquifer designated by the New Jersey Department of Environmental Protection (NJDEP) in NJAC 7:9C.

1.5.4.2 FTMM-53 (Former Gas Station at Building 699)

1.5.4.2.1 FTMM-53 is underlain by the Hornerstown Formation, which consists predominantly of silty sand with varying percentages of clay. Geoprobe soil sampling conducted in 2000 identified silty clay lenses between depths of 0.5 and 10 feet bgs (Versar, 2002). However, the stratigraphy below the uppermost 10 feet of the saturated zone at this site has not been characterized. Therefore, the presence of shallow and deeper water-bearing zones consisting predominantly of sand and separated by lower-permeability units, such as have been described for FTMM-22 (paragraph 1.5.4.1.1) has not been described for FTMM-53. The depth to groundwater is approximately 9 to 10 feet bgs, and groundwater flow in the uppermost water-bearing zone is generally in a southerly to southeasterly direction toward Husky Creek except for a localized cone of depression around the groundwater extraction wells.

1.5.4.3 FTMM-59 (Former Auto Repair Shop at Building 1122)

1.5.4.3.1 Geologic and hydrogeologic information for Site FTMM-59 was obtained from an RI report prepared by Versar (2005). The shallowest lithologic unit underlying FTMM-59 consists of orange to brown, medium to fine sand and silt (fill material). The fill material is underlain by green, black, orange, and tan, fine to medium sand, silt and clay (Shrewsbury member of the Red Bank Formation). This unit is in turn underlain by green-gray to black, silty clay (Sandy Hook member of the Red Bank Formation). Geologic cross-sections illustrating the shallow stratigraphy at FTMM-59 are provided in **Appendix C-4**.

1.5.4.3.2 During groundwater sampling performed at FTMM-59 from 1997 to 2004, groundwater was encountered at depths ranging from 2.9 to 10.4 feet bgs with a horizontal gradient of variable magnitude toward the northwest. The groundwater underlying FTMM-59 flows to the northwest toward Mill Creek. The calculated hydraulic conductivity values obtained from slug testing at FTMM-59 range from 0.85 ft/day at monitoring well 1122-MW2 to 7.10 ft/day at well 1122-MW3, with a calculated geometric mean of 3.1 ft/day (Versar, 2005). The groundwater velocity was calculated to range from approximately 0.26 ft/day (95 feet per year [ft/yr]) to 0.97 ft/day (354 ft/yr) based on hydraulic gradients measured in October 2000.

1.5.4.4 FTMM-68 (Former Dry Cleaners at Building 700)

FTMM-68 is located immediately adjacent to FTMM-53. Therefore, the information presented for FTMM-53 in paragraph 1.5.4.2 is considered to also be representative of FTMM-68. No additional information on the geology and hydrogeology of FTMM-68 was found.

1.5.5 Site Soil

According to the Monmouth County Soil Survey (U.S. Department of Agriculture [USDA], 2008), much of the MP is covered by urban, developed land with disturbed soils, whereas the CWA is covered by less urban land complexes than the MP (Shaw, 2011). Surface soils in the vicinity of the MP and CWA generally consist of sandy loams ranging in depth from 9 to 12 inches. The surface soils are underlain by sandy loam, sandy clay loam, or loam that may grade to loamy sand at a depth of approximately 5 feet bgs. Some areas at the MP and CWA are covered by impermeable surfaces such as roads, parking lots, and buildings (AECOM, 2012).

1.5.6 Hydrology

1.5.6.1 The northeastern and southeastern portions of the MP are bordered by Parkers Creek and Oceanport Creek, respectively, and the southern portion of the MP is bordered by Husky Brook. The Shrewsbury River is located within one mile to the east of the MP. Wampam Brook is located to the south of the CWA, and Shrewsbury Creek traverses the CWA from east to west. No other surface water bodies were identified within one mile of the CWA (AECOM, 2012).

1.5.6.2 Identified surface water bodies ultimately drain into the Shrewsbury Bay, situated adjacent to the eastern edge of the MP. Shrewsbury Bay is separated from the Atlantic Ocean by a barrier island. However, channels through the barrier island ensure hydraulic connection between Shrewsbury Bay and the Atlantic Ocean. As a result, the water in Shrewsbury Bay is tidally-influenced and is brackish to saline. Water in the tributary streams to Shrewsbury Bay is also tidally-influenced, and is fresh water to brackish at low tide and brackish to saline at high tide. Storm water at FTMM drains to municipal drainage systems via overland flow (AECOM, 2012).

1.5.6.3 The U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory indicates the presence of wetlands at the MP. Parkers and Oceanport Creeks are classified as estuarine and marine deepwater with estuarine and marine wetland areas. Husky Brook and Lafetra Creek are classified predominantly as freshwater riverine, emergent wetland, and forested/shrub wetland. Husky Brook Lake is classified as a freshwater pond. Several CWA wetland areas are identified on the USFWS National Wetland Inventory. Most of Shrewsbury Creek and Wampum Brook are classified as freshwater forested/shrub wetland, and the open water in the golf course in the eastern portion of the CWA is classified as a freshwater pond (Shaw, 2011).

1.5.6.4 There are no surface water bodies within the boundaries of sites FTMM-22, FTMM-53, FTMM-59, or FTMM-68. Shrewsbury Creek is located approximately 600 feet southeast of the source area at FTMM-22 (**Figure 1.3**). Shrewsbury Creek merges with Wampum Brook just east of the CWA and just upstream of Wampum Lake. The merged drainage is called Mill Creek downstream of Wampum Lake, and Mill Creek discharges to Parkers Creek farther downstream. The nearest surface water body to FTMM-53 and FTMM-68

is Husky Brook, which is located approximately 600 feet southeast of both sites (**Figure 1.2**). Mill Creek is a tidally-influenced water body that is located approximately 100 feet north to northwest of FTMM-59 (**Figure 1.2**).

1.6 SITE HISTORY

1.6.0.1 The MP of FTMM was established in 1917 as Camp Little Silver (AECOM, 2012). The name of the Camp was changed after three months 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 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.

1.6.0.2 Camp Charles Wood was purchased in 1941 and opened in 1942. The eastern half of the property was formerly a golf course, and the western half was residential property and farmland. During World War II, the Camp was used for training Signal Corpsmen (Shaw, 2011). A Research and Development (R&D) facility, the Myer Center (Building 2700), was completed in 1954. Laboratories within the Myer Center facility developed state-of-the-art electronic and communications equipment for use by the U.S. Armed Forces.

1.6.0.3 The primary mission of FTMM was to provide command, administrative, and logistical support for Headquarters, U.S. Fort Monmouth Communications and Electronics Command (CECOM) (Shaw, 2011). CECOM was a major subordinate command of the U.S. Fort Monmouth Material Command (AMC) and was the host activity. FTMM was the center for the development of the 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 activity, mostly related to communications and electronic equipment. For the completion of these research activities, FTMM operated a variety of laboratories. Additionally, FTMM has a significant history of training and housing troops. In support of these activities, FTMM has had a full complement of support activities including vehicle maintenance, warehousing, medical and dental services, photo processing, printing, historic solid waste handling methods (e.g., landfills), and facility infrastructure [e.g., underground storage tanks (USTs)]. Many of the former activities have resulted in environmental releases that are being addressed within the Installation Restoration Program (IRP) and BRAC Environmental Condition of Property (ECP) processes (Shaw, 2011).

1.6.1 FTMM-22 (Former CW-1 Lime Pit at Building 2700)

1.6.1.1 FTMM-22 (also designated as CW-1) is located in the courtyard of Building 2700. The site encompasses a former lime pit that was used to pre-treat acidic liquid wastes produced in the laboratories in Building 2700 from 1952 to the late 1980s. The lime pit was constructed in 1952 with a concrete bottom, concrete block and mortar walls, and several internal wooden baffles. The lime pit was cleaned out in 1992 (GES, 2001).

1.6.1.2 U.S. Army Environmental Hygiene Agency (USAEHA) sampling of Building 2700 effluent from 1974-1975 showed discharges of the following wastewaters: alkaline cleaning agents, high concentrations of (hexavalent) chromium that were likely present in rinse water from a chrome plating operation, 93-94 percent sodium hydroxide slugs, sulfuric acid that was likely a dip solution used to activate a metal surface for plating, copper pickling waste, sodium dichromate as part of a cleaning agent, parabenzoquinone that was likely from

photographic processing effluent, ammonium persulfate from the printed circuit manufacturing shop, and acetone (U.S. Army, 2008).

1.6.1.3 In October 1992, the pit was cleaned out, inspected, and the limestone chips replaced. Elevated concentrations of chlorinated volatile organic compounds (VOCs) detected in samples collected during the 1992 cleanout indicated that solvents were discharged into the lime pit; the type(s) of media sampled (e.g., soil, groundwater) during pit cleanout is not known. The VOCs were associated with the pretreatment of liquid laboratory wastes from Building 2700 that were routed through former Lime Pit CW-1 prior to discharge to the sanitary sewer (GES, 2001). The lime pit was decommissioned in 2001, and the remaining limestone chips and concrete were excavated and disposed offsite; the pit was subsequently backfilled with clean fill (GES, 2010). The concrete bottom of the pit is still in place. Groundwater and soil have been extensively sampled during installation of interim remedies and subsequent environmental investigations.

1.6.1.4 Interim remedial actions implemented at FTMM-22 have included a combined air sparge/SVE system (1998 to approximately 2011); excavation and removal of the contents of the former CW-1 lime pit (2001) (portions of the concrete structure of the pit were not removed); and operation of a groundwater pump-and-treat system (2002 to approximately 2011). The air sparging portion of the air sparge/SVE system was shut down in April 2009, presumably due to a low contaminant mass removal rate; the air sparge/SVE system removed less than 1 pound of contaminant mass from the 1st quarter of 2009 through the 3rd quarter of 2010 (CALIBRE Systems, 2011).

1.6.2 FTMM-53 (Former Gas Station at Building 699)

1.6.2.1 FTMM-53 encompasses Building 699 on the MP. Building 699 was constructed in 1953 and was used as a fueling station until installation closure in 2011. The site is approximately one acre, and served as the only on-base MP location for nonmilitary vehicles to obtain fuel. Gasoline was distributed from two remote pumping islands, with a total of four dispensers. The remainder of the pump islands do not have any dispensers. The building was also historically utilized as an automobile service garage. However, automobile servicing was discontinued in 1997. A former 2,000-gallon No. 2 fuel oil UST (NJDEP registration number 0081533-112) and a former 1,000-gallon, single wall, steel waste oil UST (NJDEP registration number 0081533-197) were located immediately south of the western half of the building in the immediate vicinity of monitoring well MW-12. The fiberglass fuel oil UST was removed in 1998 in accordance with NJDEP UST procedures. Based on tank inspection, field screening of subsurface soils, and review of analytical results of collected soil samples, it was concluded that no significant historical discharges were associated with the fuel oil UST or associated piping, and No Further Action was proposed for the fuel oil UST (GES, 1999). NJDEP approval for no further action (NFA) for the No. 2 Fuel Oil UST was received in a letter dated January 10, 2003 (NJDEP, 2003). The waste oil UST was removed in January 1992 (Weston, 1993). No holes were noted during removal, and there was no visual evidence of potentially contaminated soil. Verbal approval of the tank closure report (Weston, 1993) was received from NJDEP in January 2004 (Appendix G of U.S. Army, 2007).

1.6.2.2 In September 1999 four 4,000-gallon steel USTs that contained gasoline were removed. These USTs were located northwest of Building 699 near the western end of the fueling island canopy. Numerous corrosion holes in the USTs were observed, and the

surrounding soil was visually contaminated. A fuel sheen was observed on the groundwater surface at a depth of 10 feet bgs (Versar, 2001).

1.6.2.3 In addition to the four USTs described in paragraph 1.6.2.2, the Building 699 tank system included six 10,000-gallon USTs with two remote pumping islands. The locations of these six USTs were not documented in the historical reports reviewed, but they appear to have been located northeast of the fueling island canopy based on the aerial photo of the site provided in the 2008 SI report (U.S. Army, 2008). The six USTs were removed in April 2007 and replaced with two 10,000-gallon aboveground storage tanks (ASTs) which were in use until base closure in 2011. Prior to their removal in 2007, the USTs stored various grades of gasoline. On November 5, 1984, a tank tightness test identified a 0.333 gallon per hour leak in two of the USTs. No action was taken until 1989 when a line leak was identified; subsequently, the piping was excavated and replaced. ASTs, associated piping, and the dispensing islands remain in place.

1.6.2.4 In 1989 approximately 11,000 gallons of gasoline were released into soil surrounding the gasoline USTs and associated piping. Pressure testing of the gasoline system indicated that the leak was located in the product line between the tanks and the pumps (GES, 1999). The piping and dispensing island were replaced and a light non-aqueous phase liquid (LNAPL) recovery well with a dual pump system was installed immediately after the release. The purpose of the dual pump system was to maintain hydraulic control and increase LNAPL recovery rates. A second dual-pump LNAPL recovery well was activated in 1990. A total of 6,733 gallons of LNAPL were recovered by the summer of 1990. These recovery wells are not active any more. In 1993 FTMM prepared a Remedial Action Work Plan (RAWP) at the request of NJDEP that proposed to install a SVE system and a groundwater pump and treat system with one extraction well to augment LNAPL recovery (HANDEX, 2006). The systems were installed and began operation in 2001, and were still operating in 2011. In addition, biological enhancements (i.e., enzymes, nutrients, and a bacterial consortium) were injected into the shallow subsurface in 2000 to accelerate remediation of petroleum contaminants on "hot spot" areas that were not being effectively addressed by the SVE system (Versar, 2002).

1.6.2.5 TCE (up to approximately 13.5 micrograms per liter [µg/L]) has been detected in groundwater extracted by the pump-and-treat system. These TCE impacts are likely related to releases of chlorinated solvents at adjacent Site FTMM-68 (former dry cleaners, see Section 1.6.4).

1.6.3 FTMM-59 (Former Auto Repair Shop at Building 1122)

1.6.3.1 In addition to being used as an auto repair shop, furniture paint stripping was reported in the Woodworking Craft Shop section of Building 1122 in 1973. The construction date for this building is not known. Degreasing solvents were used and generated hazardous waste from these operations. Used oil was collected in a 55-gallon drum stored inside the shop. When filled, the contents were pumped into a 995-gallon double-walled AST located between the repair shop and the adjacent car wash (Building 1124) to the east (U.S. Army, 2008). Wash water at the car wash was recycled and reused and an oil/water separator was in place. A 1993 renovation plan, which details the replacement of the floor drains at Building 1122, shows that the drains are connected to the sanitary sewer system. A former oil/water separator was also associated with this building.

1.6.3.2 Two USTs have been removed from the Building 1122 area. One UST located west of Building 1122 was removed in June 1994. The UST was a 1,500-gallon single-walled steel tank used for storing #2 fuel oil. No holes or pitting were observed during tank removal. Soil surrounding the UST showed no evidence of staining and no hydrocarbon odors were detected. Following receipt of post-excavation soil sampling results (paragraph 1.8.3.2), the UST excavation was backfilled to grade with a combination of uncontaminated excavated soil and certified clean fill (Versar, 2005). In addition, two monitoring wells were installed to confirm that groundwater quality had not been significantly impacted (U.S. Army, 2008).

1.6.3.3 A 550-gallon waste oil UST was also removed from beneath the pavement just north of northeast corner of Building 1122 in 1992. During the UST removal, the subsurface evaluator did not identify any holes in the tank and did not observe any potentially contaminated soil.

1.6.3.4 In 1995 two electrical transformers ruptured, releasing approximately 30 gallons of transformer fluid onto a grassy area 20 feet from Mill Creek. No transformer fluid entered Mill Creek, and contaminated soil was excavated and disposed offsite. Also in 1995, a failed hydraulic lift in Service Bay #12 consisting of a 50-gallon in-ground hydraulic lift reservoir tank was removed and approximately 46 cubic yards (CY) of visually stained soil were excavated and disposed offsite.

1.6.3.5 Six additional groundwater monitoring wells have been installed at the site since the first two wells were installed during the waste oil tank investigation (paragraph 1.6.3.2). Two of the six wells were reportedly installed near the chemical storage shed and paint booth/shed located north of the western end of Building 1122, one well was installed south (upgradient) of Building 1122, and four wells were installed north of the eastern half of Building 1122 (and downgradient from the former waste oil UST and failed hydraulic lifts). The specific locations of the wells installed near the chemical storage shed and paint booth/shed are unknown and will be determined during the next site visit.

1.6.3.6 In situ chemical oxidation (ISCO) injections using RegenOx™ have been performed at the site, presumably to treat petroleum-related impacts associated with the removed USTs. The post-ISCO remedy selected for the Building 1122 site involves the use of monitored natural attenuation (MNA) to address concentrations of TCE in site groundwater that continue to exceed the GWQS.

1.6.4 FTMM-68 (Former Dry Cleaners at Building 700)

1.6.4.1 FTMM-68 encompasses Building 700 on the MP. This building is currently vacant, but was previously used for office space in connection with Army recruitment. Building 700 was also a former dry cleaning facility that used chlorinated solvents (PCE/TCE) (AECOM, 2012). FTMM personnel excavated a 500-gallon solvent UST in April 2011. The tank, which was located at the southwestern corner of Building 700 based on a historical sketch provided in **Appendix C-5**, was observed to be heavily corroded and leaking in several places. Approximately 450 gallons of impacted water were removed and drummed, along with soil that appeared to be impacted by VOCs. Soil samples were collected from the excavation and analyzed for VOCs. The soil samples collected at the bottom of the excavation (7.5 feet bgs) and beneath the tank piping run (2.5 feet bgs) exceeded the NJDEP residential direct contact soil remediation standard (RDCSRS) for PCE.

1.6.4.2 Monitoring wells were reportedly installed near the south side of Building 700 to investigate groundwater quality, but were not sampled due to closure of FTMM. What appears to be three wellheads are visible on a 2012 aerial photograph of this site. However, a well inventory table for FTMM only lists two wells, both installed in August 2011. Well 565MW01 is screened from 5 to 15 feet bgs, and well 565MW01D is screened from 18 to 23 feet bgs. Survey data for these two wells are not available.

1.7 CURRENT AND PROJECTED LAND USE

1.7.1 The 637-acre MP provided supporting administrative, training, and housing functions, as well as many of the community and industrial facilities for FTMM. These facilities are distributed across the property, with no distinct clustering of functions. A total of 397 buildings and structures are present at the MP. The CWA was used primarily for R&D, testing, housing, and recreation. The former CWA research, development, and testing facilities occupy the southwest corner of CWA. The northwest corner formerly consisted of residential units but is currently undeveloped. Residential units currently occupy the southeastern boundary and the golf course occupies the northeast corner. The CWA contains a total of 241 buildings and structures.

1.7.2 The footprint of the former lime pit at FTMM-22 is currently undeveloped and accessible. The immediately adjacent area is dominated by Building 2700, which surrounds the former lime pit on three sides. Building 2700 is currently vacant and unused.

1.7.3 Building 699 (FTMM-53) is abandoned and no longer operates as a full-service gas station and convenience store. Building 1122 (FTMM-59) is also abandoned and no longer houses an active "do-it-yourself" vehicle repair shop. FTMM-68 encompasses Building 700 (former dry cleaners) on the MP; this building is currently vacant. The projected future land use at FTMM-22, FTMM-53, FTMM-59, and FTMM-68 is not known at this time.

1.8 PREVIOUS INVESTIGATIONS AND HISTORICAL DATA

The scope and results of previous environmental investigations at FTMM-22, -53, -59, and -68 are summarized below. Construction details for wells previously installed at these sites are summarized in **Table 1.1**.

1.8.1 FTMM-22 (Former CW-1 Lime Pit at Building 2700)

1.8.1.1 Groundwater and unconsolidated soil have been extensively sampled during installation of interim remedies and subsequent investigations. Investigations have included 67 soil borings, 18 direct push groundwater grab samples, and at least 18 monitoring wells.

1.8.1.2 In 1994, one soil sample for laboratory analysis of TCL (target compound list) plus 30 parameters (TCL+30) and target analyte list (TAL) metals was collected from the interval across the water-table during drilling of monitoring wells MW-26, MW-27, MW-28, and MW-29. This depth interval was selected due to the absence of visible staining and elevated field instrument readings that would be indicative of VOCs. These wells are located near the corners of the former lime pit (**Figure 1.4** and **Appendix C-2**). No COPCs were detected above the most stringent NJDEP Direct Contact Soil Cleanup Criteria (i.e., the lowest of the impact to groundwater and residential direct contact criteria) in the four soil samples collected from these borings (see summary results Table 1 in **Appendix C-2**).

1.8.1.3 In 1996, subsurface soil samples from several depth intervals were collected during the installation of wells MW-281, MW-282 and MW-291 (**Appendix C-2**). TCE was reported at 7.8 mg/kg (milligrams per kilogram) in the 18.8 to 19.4 foot interval of well bore MW-281. This concentration was greater than the NJDEP Impact to Ground Water Soil Cleanup Criterion of 1 mg/kg. The concentrations of other detected compounds were less than the most stringent NJDEP Soil Cleanup Criteria (see summary results Table 3 in **Appendix C-2**).

1.8.1.4 Based on the soil sampling performed in 1994 and 1996, it was concluded that 1) the source of VOCs in the vicinity of CW-1 was removed in 1992; 2) the unsaturated soils in the vicinity of CW-1 had not been impacted by VOCs; 3) PCE, TCE, and cis-1,2-dichloroethene (DCE) were the only VOCs of concern in the vicinity of CW-1; and 4) elevated concentrations of PCE, TCE, and or cis-1,2-DCE were detected only in one saturated soil sample (Smith Technology Corporation, 1997).

1.8.1.5 In 1999, 63 soil borings were advanced to depths of 11 to 20 feet bgs using direct push methods to investigate possible residual sources of VOCs in soil at CW-1 (**Appendix C-2**). Each sample collected was logged and field-screened using a photoionization detector (PID). One soil sample from each boring was retained for laboratory analysis based on PID readings and visual observations. If visual evidence and PID readings indicating impact were not present, the retained sample was collected from the 6-inch interval immediately above the water-table. The samples were analyzed for VOCs plus the 10 greatest non-targeted chromatogram peaks at the Fort Monmouth Environmental Testing Laboratory using U.S. Environmental Protection Agency (USEPA) Method SW8260. Methylene chloride was the only VOC detected in soil samples from these borings; this compound was determined to be indicative of laboratory contamination rather than site-related contamination.

1.8.1.6 Seven monitoring wells were installed in the area of CW-1 from 1994 through 1996, including six shallow wells (MW26, MW27, MW28, MW29, MW282, and MW291) screened across the water-table and one deep well (MW281) screened from 31 to 41 feet bgs. Following collection of groundwater grab samples using a HydroPunch in 1999 and analysis of the samples for VOCs, eight additional shallow wells (MW30 to MW37) and three deep zone wells (MW38 to MW40) were installed in 2000 to delineate the dissolved-phase VOC plume in groundwater at CW-1 (**Figure 1.4** and **Appendix C-2**). The total depth of each deep monitoring well was approximately 50 feet bgs with screen lengths of 20 feet, and the total depth of shallow wells ranged from 17 to 22 feet bgs with screen lengths of approximately 8 to 15 feet.

1.8.1.7 Groundwater sampling in 2000 detected TCE at concentrations up to 264 µg/L and cis-1,2-DCE at concentrations up to 352 µg/L. Groundwater impacts in the shallow zone in 2000 extended to a maximum distance of 100 feet downgradient from the source area (to well MW-291) and were delineated by the existing well network, while impacts to the deep zone were delineated by the deep well network and were limited to source area well MW-281. Groundwater quality data obtained to date does not indicate the presence of dense non-aqueous phase liquid (DNAPL) at the site.

1.8.1.8 The most recent groundwater analytical data reviewed during preparation of this work plan (for samples collected in 2010) indicate that the only target analytes that exceeded the NJDEP GWQS were as follows:

- TCE in shallow wells MW-28 (2.69 µg/L) and MW-29 (2.00 µg/L) and deep well MW-281 (37.6 µg/L);
- Antimony in shallow wells MW-29, MW-36, and MW-37 (6.6 to 13.6 µg/L) and deep wells MW-38, MW-39, and MW-40 (7.0 to 12.9 µg/L);
- Arsenic in deep wells MW-38, MW-39, and MW-40 (5.1 to 36.4 µg/L); and
- Lead in deep well MW-38 (5.3 µg/L).

The NJDEP GWQS for TCE, antimony, arsenic, and lead are 1 µg/L, 6 µg/L, 3 µg/L, and 5 µg/L, respectively. The locations of these wells and the inferred extent of the TCE plume in the shallow zone in August 2010 are shown in **Appendix C-2**.

1.8.1.9 The Remedial Action Progress Report for 1st Quarter 2009 Through 3rd Quarter 2010 (Calibre Systems, 2011) stated that the elevated metal concentrations detected in groundwater could be caused by native metal concentrations in the glauconitic soils underlying the project site. The report concluded that, based on the background evaluation of metals, no further action with regard to metals in groundwater was recommended and sampling and analysis for metals was proposed to be discontinued. According to Shaw (2011), elevated concentrations of arsenic and lead in groundwater at FTMM have been found within the glauconitic-rich soil layers and are most likely attributed to these natural conditions (FTMM, 2011). Ambient levels of selected metals in New Jersey Urban Coastal Plain Region soils, presented by BEM Systems (1998), are provided in **Appendix C-1**. Dooley (2001) reported higher than ambient concentrations of several metals in glauconitic soils in the New Jersey coastal plain. In particular, the 90th percentile concentrations of aluminum (49,130 mg/kg), arsenic (77 mg/kg), barium (340 mg/kg), beryllium (9.6 mg/kg), chromium (769 mg/kg), cobalt (11 mg/kg), nickel (24 mg/kg), vanadium (213 mg/kg), and zinc (mg/kg) were greater than those reported as ambient soil levels for the urban coastal region. In a letter dated May 7, 2012, NJDEP concurred that detected concentrations of antimony, arsenic, and lead found in this area reflect naturally occurring background conditions, and no further action for metals in groundwater at this area of concern was warranted (NJDEP, 2012b). The letter also stated that NJDEP was awaiting a Remedial Action Selection Report to address TCE in soil and groundwater.

1.8.1.10 During a previous site investigation (SI) (U.S. Army, 2008) soil gas and indoor air samples were collected in association with Building 2700 to evaluate the potential for vapor intrusion (VI) at this facility. No constituents were detected at concentrations above the NJDEP Indoor Air Non-Residential or Residential Standards.

1.8.1.11 Two sub-slab soil gas samples, one duplicate sub-slab soil gas sample, two indoor air samples, one duplicate indoor air sample, and one ambient air sample were collected at Building 2700 and analyzed for 12 VOCs during a recent VI investigation (AECOM, 2012). The auditorium where these samples were collected was situated above a crawl space. The sub-slab soil gas samples were collected by drilling through the concrete floor of the auditorium and collecting a sample from the crawl space. No analytes were detected in the sub-slab soil gas samples. The reporting limits for non-detect sub-slab soil gas results were below the residential and nonresidential Soil Gas Screening Levels (SGSLs). The only analyte detected in an indoor air, duplicate indoor air or ambient air sample at Building 2700 was chloromethane, which was detected at a concentration of 1 microgram per cubic meter ($\mu g/m^3$) in both IA-9 and AA-5; this concentration is below the residential and nonresidential Indoor Air Screening Levels (IASLs)

for chloromethane, which are 95 and 130 µg/m^3, respectively. The reporting limits for non-detect indoor/ambient air results were below the residential and non-residential IASLs.

1.8.1.12 Chloromethane is considered to be unrelated to activities at Fort Monmouth, and is thought to have been a background presence in air (AECOM, 2012). Based on historical groundwater analytical data, it appears that groundwater could be a potential TCE source for VI in the building. However, based on the VI data collected during the site investigation (AECOM, 2012), there was no accumulation of chlorinated VOC vapors detected beneath Building 2700 and there were no detectable concentrations of chlorinated VOCs within Building 2700. As a result, the VI pathway for chlorinated VOCs at Building 2700 was considered incomplete.

1.8.1.13 Review of available information indicates that sufficient hydraulic characterization information (e.g., hydraulic conductivity for potentially impacted aquifer units) has not been collected at FTMM-22 to the extent necessary to complete the RI in accordance with CERCLA and NJDEP requirements to the extent possible.

1.8.2 FTMM-53 (Former Gas Station at Building 699)

1.8.2.1 Five post-excavation soil samples were collected along the sidewalls and base of the waste oil tank excavation in 1992 (Weston, 1993). The samples were analyzed for total petroleum hydrocarbons (TPH) and priority pollutants plus 40 tentatively identified compounds (TICs). One sample (SP2) contained a TPH concentration of 11,600 mg/kg, which exceeded the proposed NJDEP cleanup criterion of 10,000 mg/kg, and an elevated concentration of lead (332.7 mg/kg, which is less than the NJDEP RDCSRS of 400 mg/kg). A second soil sample (SP1) contained a TPH concentration of 6,090 mg/kg, which exceeds the current EPH criterion of 5,100 mg/kg (see Weston's [1993] Figure 2-1 and Table 3-1 in **Appendix C-3**). A monitoring well (MW-12) was subsequently installed (in 1992) at the former UST location, and three soil samples were collected for analysis of TPH during advancement of the monitoring well borehole. TPH concentrations ranged from non-detect to 22 mg/kg. In 1992, a groundwater sample from MW-12 was analyzed for VOCs + 15 TICs and lead. Lead was detected at a concentration of 6 µg/L, which slightly exceeded the GWQS of 5 µg/L. Methylene chloride, a common laboratory contaminant that was also detected in an associated blank sample, was detected at an estimated concentration of 4 µg/L. A second groundwater sample was collected from MW-12 in 1993 and analyzed for the same parameters. Lead was not detected, and methylene chloride was detected in the primary sample (estimated concentration of 2.9 µg/L) and an associated laboratory blank. The tank closure report (Weston, 1993) recommended 1) no further action relative to the elevated concentrations of TPH and lead detected in post-excavation soil sample SP2, and 2) analysis of a groundwater sample from well MW-12 for base neutral compounds + 25 TICs. Verbal approval of the closure report was received from NJDEP in January 2004 (Appendix G of U.S. Army, 2007), and no additional sampling at the former waste oil UST location is proposed as part of this RI.

1.8.2.2 In 1993, 27 soil samples were collected on the east side of the site at 5.5 feet bgs (the soil-groundwater interface) to define the extent of gasoline contamination. Soil samples were analyzed for TPH, VOCs with a forward library search of 10 compounds (VOCs+10), and lead. Total concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) ranged from 125 to 2,170 mg/kg, and total VOC concentrations ranged from 307 to 2,877 mg/kg (GES, 1999, see results table and sample location map in **Appendix C-3**). However, the extent of contamination was not completely defined. In September 1999, four USTs were discovered

below the pump island area on the west side of the site. The USTs and associated contaminated soil were removed, and soil sampling was conducted. The data indicated that total BTEX and total VOC concentrations in the soils beneath the USTs ranged from 2 to 1,487 mg/kg and 26 to 1,728 mg/kg, respectively.

1.8.2.3 Supplemental soil sampling was performed at the site in 2000 to further delineate the horizontal and vertical extent of soil contamination, and to identify "hot spot" areas that could be addressed by active remediation. Soil samples were collected on a sampling grid established across the site at 30-foot intervals using a Geoprobe®. Soil samples were collected at alternating 6-inch intervals from ground surface to a depth of 12 feet at each location for a total of 12 samples per boring. The collected samples were analyzed at the FTMM Environmental Testing Laboratory for VOCs (USEPA Method SW8260), TPH (NJDEP Method OQA-QAM-025, 10/97), lead (USEPA Method SW3051A/ 3111B FLAA PB), and percent solids.

1.8.2.4 COPCs were detected at 53 of the 83 boring locations; the primary analytes detected were TPH and BTEX. TPH were detected at 41 boring locations with 19 locations containing detections above the RDCSRS of 1,000 mg/kg. The benzene detections ranged to a maximum of 8,739 mg/kg. Benzene was detected at 22 boring locations with 20 locations containing detections above the then-current RDCSRS of 3 mg/kg. The detections ranged to a maximum of 590 mg/kg; a trend of decreasing concentrations with increasing depth was observed at some locations. Lead was detected in 29 borings at concentrations below the RDCSRS of 400 mg/kg. As indicated on the sampling results map in **Appendix C-3**, the soil sampling performed in 2000 defined the lateral extent of RDCSRS exceedances to the south, west, and east, but not to the north (i.e., hydraulically upgradient), due to the presence of Saltzman Avenue.

1.8.2.5 Additional soil sampling was performed in 2001, approximately 180 days after completion of the enhanced bioremediation enzyme injection program (see Section 1.6.2) to evaluate treatment effectiveness. A total of 108 soil samples were collected from alternating 6-inch intervals at 17 boring locations to a depth of 6 feet bgs. Benzene, toluene, and total xylene concentrations exceeding the then-current RDCSRS were detected at 15, 1, and 11 boring locations, respectively, with maximum concentrations of 100 mg/kg, 1,100 mg/kg, and 410 mg/kg, respectively. TPH concentrations were below the RDCSRS of 1,000 mg/kg. Elevated benzene concentrations generally extended to the full 6-foot depth of the soil borings. Based on the results, it was concluded that concentrations of COPCs exceeding the RDCSRS decreased significantly throughout the application area during the 6-month treatment period. However, some RDCSRS exceedances occurred in the most northerly soil borings near the south edge of Saltzman Avenue; therefore, the post-bioremediation soil dataset did not adequately characterize the extent of soil contamination to the north (see sample results map in **Appendix C-3**).

1.8.2.6 As of 2004 there were 15 groundwater monitoring wells and four recovery wells installed in the shallow water bearing unit (**Figure 1.5**). The monitoring wells are generally screened over a 10- to 15-foot interval between 2 and 17 feet bgs. Most of these wells were sampled quarterly for VOCs, including TICs, and 12 metals through the 3rd quarter of 2011. Groundwater sampling data for 11 monitoring wells and 3 recovery wells collected in 2010 (the most recent data available as this work plan was being prepared) indicate that concentrations of fuel-related VOCs (i.e., benzene and tert-butyl alcohol [TBA]) that exceed the GWQS are

limited to the area of the former gasoline release just north to northeast of Building 699. TBA was used as an octane booster or oxygenate additive to gasoline. Concentrations of fuel-related analytes that exceeded NJDEP GWQS in 2010 included benzene in 699MW-4, 699MW-6, 699RW-4 (March 2009, not sampled in 2010), 699RW-5, and 699RW-11 (maximum 9.07 µg/L), TBA in 699RW-11, (maximum 238 µg/L), and lead in 699MW-6, 699MW-15, 699RW-4, and 699RW-11 (maximum 31.1 µg/L in 699MW-15, located approximately 260 feet north [hydraulically upgradient] of the former gasoline UST area). In addition, low concentrations of PCE and/or TCE were detected in wells 699MW-16, 699MW-9, and 699RW-11 in 2010 at maximum concentrations of 13.5 µg/L and 2.8 µg/L, respectively. These solvents were likely pulled to FTMM-53 from the vicinity of Building 700 (adjacent site FTMM-68) by the operating pump and treat system, and their extent in groundwater is not well characterized. Alternatively, they could be related to storage and release of waste oil at FTMM-53, although a waste oil release has not been documented in the historical record reviewed during preparation of this work plan. The former waste oil UST was located on the south side of Building 699 near MW-12, hydraulically cross-gradient to downgradient of the PCE/TCE detections in FTMM-53 wells.

1.8.2.7 There were also scattered occurrences of metal concentrations besides lead that exceeded GWQS in 2010. These metals included antimony, arsenic, beryllium, cadmium, chromium, nickel, and selenium. In addition, total TIC concentrations exceeded the standard of 500 µg/L in wells 699MW-4 and 699RW-11. Maximum concentrations of benzene, TBA, and lead that exceeded GWQS in 2010 are plotted on a site map in **Appendix C-3**.

1.8.2.8 Groundwater quality at greater depths has not been characterized because, until recently, the site was only impacted by petroleum contaminants which tend to be localized in shallow water-bearing zone. However, the potential for impact to deeper zones increases with the presence of PCE and TCE that is potentially associated with adjacent site FTMM-68.

1.8.2.9 A total of 21 VOCs were detected in near-slab and sub-slab soil gas samples collected at Building 699 during a previous site investigation in 2007 (U.S. Army, 2008). No VOCs were detected in near-slab soil gas samples above NJDEP Generic Non-Residential SGSLs (March 2007). PCE was detected above its then-current Residential and Non-Residential SGSLs (34 and 36 $\mu g/m^3$) in both sub-slab soil gas samples at concentrations of 151 $\mu g/m^3$ and 241 $\mu g/m^3$. However, the detected concentrations are below the current residential and non-residential SGSLs for PCE of 470 and 2,400 $\mu g/m^3$, respectively. No constituents present in groundwater above the Ground Water Screening Level (GWSL) at Building 699 were detected above the Non-Residential SGSLs. However, due to the PCE detections, further evaluation of indoor air in Building 699 was recommended.

1.8.2.10 Two sub-slab soil gas samples, one indoor air sample, one ambient air sample, and two duplicate ambient air samples were collected at Building 699 in 2012 during a subsequent VI investigation (AECOM, 2012). The only analytes detected in a sub-slab soil gas sample were PCE and TCE. PCE was detected at concentrations of 210 and 360 $\mu g/m^3$, both of which exceeded the then-current residential and non-residential SGSLs for PCE of 34 and 36 $\mu g/m^3$, respectively. However, the detected concentrations are below the current residential and non-residential SGSLs for PCE of 470 and 2,400 $\mu g/m^3$, respectively. TCE was detected at a concentration of 94 $\mu g/m^3$, which exceeded the then-current residential and non-residential SGSLs for TCE of 27 and 27 $\mu g/m^3$, respectively. The residential SGSL for TCE has not changed; however, the current non-residential SGSL for TCE (150 $\mu g/m^3$) was not exceeded.

The reporting limits for non-detect sub-slab soil gas results were below the then-current residential and non-residential SGSLs (AECOM, 2012).

1.8.2.11 The only analyte detected in an indoor air, ambient air and/or duplicate ambient air sample collected at Building 699 in 2012 was chloromethane, which was detected at a concentration of 1 $\mu g/m^3$; this concentration is below the current residential and non-residential IASLs for chloromethane, which are 94 and 390 $\mu g/m^3$, respectively. The reporting limits for non-detect indoor/ambient/duplicate air results were below the residential and nonresidential IASLs.

1.8.2.12 Based on historical groundwater analytical data and VI data collected by AECOM (AECOM, 2012), it was concluded that groundwater was acting as a source for the PCE (and likely TCE) contamination detected in sub-slab soil gas at Building 699. However, given that neither PCE nor TCE were detected in indoor air, the VI pathway for PCE, TCE, and the other targeted chlorinated VOCs at Building 699 was considered incomplete.

1.8.2.13 Review of the available site information indicates that the hydraulic characterization information (e.g., hydraulic conductivity for potentially impacted aquifer units) that is necessary to complete the RI in accordance with CERCLA and NJDEP requirements to the extent possible has not been collected at FTMM-53.

1.8.3 FTMM-59 (Former Auto Repair Shop at Building 1122)

1.8.3.1 Following removal of the waste oil UST in 1992, five post-excavation soil samples were collected and analyzed for TPH, organic and inorganic TCL compounds, and 40 TICs. TPH was detected at concentrations ranging from 190 mg/kg to 1,220 mg/kg, but did not exceed the proposed NJDEP soil cleanup criterion of 10,000 mg/kg (Versar, 2005). In 1995, a soil excavation was conducted in the area between the former waste oil tank and Mill Creek. The excavation was approximately 100 feet long, 50 feet wide, and 8 feet deep (**Figure 1.6**). Approximately 3,000 CY of soil were removed and disposed offsite. Post-excavation soil samples collected in 1995 were in compliance with NJDEP soil cleanup criteria (VEETech, P.C., 2010).

1.8.3.2 In 1994, following removal of the heating oil UST, six post-excavation soil samples were collected and analyzed for TPH, and five additional samples for TPH analysis were collected following removal of the UST's copper fuel lines (**Appendix C-4**). There were no exceedances of the NJDEP soil cleanup criterion of 10,000 mg/kg for total organic compounds (Versar, 2005).

1.8.3.3 In 1995, 11 surface soil samples (1 to 6 inches bgs) were collected from within an electrical transformer spill area at one of the storage sheds northeast of FTMM-59. Approximately 30 gallons of transformer fluid were released onto a grassy area about 20 feet from Mill Creek. Three of the 11 samples had TPH concentrations exceeding the NJDEP soil cleanup criterion of 10,000 mg/kg, and approximately 155 CY of stained soil were subsequently excavated and disposed offsite. Analysis of 12 post-excavation soil samples for TPH and polychlorinated biphenyls (PCBs) indicated compliance with NJDEP soil cleanup criteria (VEETech, P.C. 2010).

1.8.3.4 Also in 1995, seven soil borings were advanced in Service Bay #12 at the failed in-ground hydraulic vehicle lift (**Figure 1.6**); soil samples were collected both prior to and

following removal of the lift and contaminated soil. The TPH concentration in one soil sample collected at 8 feet bgs prior to removal and one sample collected from the center bottom of the west wall of the excavation after removal exceeded the NJDEP soil cleanup criterion (VEETech, P.C., 2010).

1.8.3.5 In 2000, 14 soil borings were advanced in the northeastern corner of the asphalt parking lot area of the site, and 15 soil samples and 15 groundwater samples were collected (see map in **Appendix C-4** for boring locations and analysis results). Soil samples were analyzed for VOCs + 15 TICs. Soil analysis results were in compliance with NJDEP soil cleanup criteria. PCE was detected in groundwater at concentrations exceeding NJDEP GWQS at boring #2 and #3, and bromodichloromethane slightly exceeded the GWQS at boring #6 (VEETech, P.C., 2010).

1.8.3.6 A Geoprobe® investigation was performed in April 2004 to further evaluate site soil and groundwater conditions and potential contaminant migration at FTMM-59. Eighteen soil samples and 31 groundwater samples were collected at 24 boring locations and one seep location (see boring location map with analysis results in **Appendix C-4**). Some soil samples were analyzed for VOCs + 15 TICs and TPH, while others were only analyzed for TPH. Six VOCs were detected in soil samples at concentrations exceeding the NJDEP Residential Direct Contact soil cleanup criteria in effect at the time. Specifically, BTEX compounds exceeded their NJDEP RDCSRS in a soil sample from boring GW21 at a depth of 10 feet bgs (presumably below the water-table, which was generally present at approximately 4 to 8 feet bgs at nearby well 1122-MW4). This area had been excavated to a depth of 8 feet bgs in 1995 (**Figure 1.6**). The other two NJDEP RDCSRS exceedances were for acetone and methylene chloride in a soil sample collected at a seep near Mill Creek. These compounds are not COPCs in site groundwater and may be indicative of laboratory contamination. Two VOCs and one semi-volatile organic compound (SVOC) were detected in groundwater samples from the Geoprobe® borings at concentrations exceeding their respective NJDEP GWQS (**Appendix C-4**). A well sump was installed for the removal of free-phase product; however, no free-phase product was observed. Based on post-excavation soil sampling results collected during two UST closures at Site 1122 (waste oil and heating oil) and analytical results for Geoprobe® soil samples collected in March 2000 and April and May 2004, the RI report (Versar, 2005) concluded that there were no identified COPCs in soils at Site 1122.

1.8.3.7 In December 2009 temporary well point B1 was advanced adjacent to a malfunctioning in-ground hydraulic lift inside Building 1122's Service Bay #10, located in the southeast corner of Building 1122 (**Figure 1.6** and **Appendix C-4**). Separate phase product was observed at B1 and environmental samples were not collected. Subsequently, soil borings/ temporary well points B2, NE, SE and FE were advanced to delineate the free product detected at B1 (**Appendix C-4**). A soil sample from B2 (6.5-7.0 feet bgs) contained TPH at a concentration of 21,619 mg/kg, which exceeded the NJDEP soil cleanup criterion of 10,000 mg/kg. In addition, total concentrations of TICs exceeded the NJDEP GWQS (500 µg/L) at a concentration of 1,109J µg/L in the groundwater sample collected from the temporary well point. No other exceedances of the NJDEP GWQS were detected in the groundwater sample.

1.8.3.8 In March 2010, borings NE, SE and FE were advanced outside of Building 1122 to delineate boundaries for potential excavation of soil during removal of the Service Bay #10 in-ground hydraulic lift. The borings consisted of one soil sample and one groundwater sample

collected via temporary well point from each location. Soil samples were collected at depths ranging from 3.0 to 5.5 feet bgs. The only exceedance of a NJDEP soil or groundwater cleanup criterion was PCE in one groundwater sample at 1.01 µg/L (compared to the GWQS of 1 µg/L) (FTMM Directorate of Public Works [DPW], 2012).

1.8.3.9 Soil samples collected in May 2010 adjacent to the paint booth/shed and chemical storage shed (**Figure 1.6** and **Appendix C-4**) exceeded NJDEP RDCSRS for the PAHs (polynuclear aromatic hydrocarbons) benzo(*b*)fluoranthene and benzo(*a*)pyrene (two locations, 0-6 inches bgs), SVOC TICS (two locations, 0-6 inches bgs), lead (two locations, 0-6 inches bgs), and vanadium (three locations, 5-6 feet bgs). Samples collected from a depth of 0-6 inches were also analyzed for pesticides, and samples collected from a depth of 0-6 inches adjacent to the Chemical Storage Shed were analyzed for PCBs. None of the detected pesticide or PCB concentrations exceeded a NJDEP RDCSRS (FTMM DPW, 2012). Sample locations and analysis results for soil are provided on a figure and in a table, respectively, in **Appendix C-4**. Groundwater grab samples exceeded NJDEP GWQS for naphthalene, aluminum, antimony, arsenic, beryllium, cadmium, iron, lead, manganese, silver, and sodium. Permanent monitoring wells were subsequently installed in this area as described in paragraph 1.8.3.12.

1.8.3.10 Five groundwater monitoring wells installed in unconsolidated overburden at FTMM-59 were monitored through the 3rd Quarter of 2011. Well locations are shown on **Figure 1.6**. Monitoring of 1122MW-01 and 1122MW-02 began in 1997, while monitoring of 1122MW-03 through 1122MW-05 began in 2000. Samples have been analyzed for VOCs, and metals were added as target analytes beginning in July 2010. Analyses for SVOCs and pesticides/PCBs were discontinued for the five monitoring wells in the 4th Quarter of 2004 (FTMM DPW, 2012). PCE was previously identified as a COPC in groundwater at Site FTMM-59, with a maximum concentration of 9 µg/L at well 1122MW01 in 1999 based on historical groundwater sampling results provided by the Army. However, PCE concentrations in groundwater have decreased over time and have been below the NJDEP GWQS since 2007. The only exceedance of a NJDEP GWQS for VOCs in 2009 and 2010 was a single detection of bromodichloroethene in 1122MW-01 in April 2010 (2.26 µg/L versus a GWQS of 1 µg/L). This compound is not believed to be a site-related COPC. The only exceedance of a NJDEP GWQS for metals in July 2010 (the most recent data available at the time of this work plan preparation) was beryllium in groundwater from three wells at concentrations of 1.02 to 2.64 µg/L (compared to a GWQS of 1 µg/L) (FTMM DPW, 2012). Low concentrations of beryllium that slightly exceed the GWQS are widespread in shallow groundwater at multiple locations across FTMM, and are likely representative of background conditions and/or due to the presence of turbidity in the sample.

1.8.3.11 A sixth monitoring well, 1122MW06, was installed hydraulically upgradient of Building 1122 in July 2010 to evaluate contaminant migration from an upgradient source. Initial ground water sampling of 1122MW06 was conducted in August 2010. Analytical data for 1122MW06 indicated no detections for VOCs, although concentrations of select metals were detected and exceeded their respective NJDEP GWQS (aluminum, beryllium, manganese, and sodium) (FTMM DPW, 2012). These metals are not believed to be site-related contaminants.

1.8.3.12 Two overburden monitoring wells were installed as part of a SI associated with the paint booth/shed and chemical storage shed. The two new wells have not been surveyed or

sampled; their northing and easting coordinates and top of casing elevations will be determined, and they will be sampled, during the RI.

1.8.3.13 A total of six sediment samples were collected from three distinct locations in Mill Creek adjacent to Building 1122 in 2007 (see map in **Appendix C-4**). Two samples were collected from each location; one from the 0- to 6-inch interval below the creek, and another from the 12- to 18-inch interval, measured from the bottom of the creek. Three PAHs (anthracene, chrysene, and phenanthrene) and five metals (cadmium, chromium, copper, lead, and zinc) were detected in sediment at concentrations greater than the Marine/Estuarine Sediment Screening Values-ER-L and their respective Main Post background concentrations. As a result, these compounds are considered COPCs. Sediments at Parcel 43 were recommended for further evaluation as part of a facility-wide baseline ecological evaluation (U.S. Army, 2008).

1.8.3.14 Two surface water samples were collected from Mill Creek adjacent to Building 1122, FTMM-59 and Parcel 43 as part of the 2010 baseline ecological evaluation (Shaw, 2011). One surface water sample was collected in Mill Creek to the east of Building 1122 at a storm water outfall, and the other sample was collected in Mill Creek at a point closest to Building 1122. Mill Creek, in the vicinity of Building 1122, FTMM-59 and Parcel 43, is classified as freshwater. No PCBs were detected in surface water samples. Two VOCs (cis-1,2-DCE and PCE) were detected in surface water samples but at concentrations less than the freshwater ecological screening criteria (ESC). Therefore, VOCs were not considered chemicals of potential ecological concern (COPECs) in surface water. Six SVOCs (anthracene, benzo(a)anthracene, benzo(a)pyrene, benzoic acid, 3,3′-dichlorobenzidine, and 1,2,4-trichlorobenzene) were detected in the surface water samples. Anthracene, benzo(a)pyrene, and benzo(a)anthracene concentrations exceeded the applicable freshwater ESC, and were considered COPECs in surface water at Building 1122. A total of 12 metals were detected in surface water samples; only lead was detected at concentrations greater than the applicable freshwater ESC. Therefore, lead was considered a COPEC for surface water at Building 1122 (Shaw, 2011).

1.8.3.15 Following review of available surface water and sediment data, the Final Basewide Ecological Evaluation Report (Shaw, 2011) concluded that constituents at Building 1122 (FTMM-59) and Parcel 43 are unlikely to have a deleterious effect on sensitive ecological receptors or habitats, and additional ecological assessments related to Building 1122 (FTMM-59) and Parcel 43 were not warranted or recommended. The NJDEP concurred with the conclusions of the BEE in a letter dated August 27, 2012 (NJDEP, 2012c).

1.8.3.16 VI at Building 1122 was evaluated in 2007 through the collection of near-slab soil gas samples, sub-slab soil gas samples, and indoor air samples (see map in **Appendix C-4**). PCE and TCE exceeded NJDEP Non-Residential SGSLs in soil gas collected at FTMM-59, but were not detected in indoor air within Building 1122. Benzene and dichloromethane were detected in indoor air at concentrations greater than the NJDEP Non-Residential IASLs at Building 1122. Benzene and dichloromethane were also detected at concentrations greater than the NJDEP Indoor Air NRSs in indoor air at Building 1122. The SI report (U.S. Army, 2008) concluded that benzene and dichloromethane detections in indoor air were likely attributable to activities within the building and the use of products that contain these constituents. A second round of indoor air sampling was recommended to confirm that constituents associated with groundwater are not present above criteria for indoor air at Building 1122. However, a follow-on VI investigation was not performed at Building 1122 because this building is located outside of the critical

distance from a well containing VOCs at concentrations exceeding the GWQS (i.e., 100' or 30', depending on the contaminant) recommended by the NJDEP (2012a) VI Guidance (AECOM, 2012). Concentrations of benzene and dichloromethane in groundwater samples from site monitoring wells collected from 1997 to 2010 did not exceed NJDEP GWQS or vapor intrusion screening levels.

1.8.4 FTMM-68 (Former Dry Cleaners at Building 700)

1.8.4.1 In April and May 2011, six post-excavation soil samples were collected from the sidewalls, the bottom of the solvent UST excavation (**Figure 1.7**), and along the buried piping run. Groundwater was encountered at approximately 8 feet bgs during the UST removal activities. Soil samples were analyzed for VOCs plus TICs (VOC+10). Results of the soil samples collected from the excavation are shown on a site sketch in **Appendix C-5**. The sample from the bottom of the center of the excavation (7.5 feet bgs) contained PCE at a concentration of 23,889 mg/kg, compared to NJDEP soil cleanup criterion for residential and non-residential use of 2 mg/kg and 5 mg/kg, respectively. In addition, the soil sample collected from the northern end of the western sidewall at a depth of 2.5 feet bgs contained PCE at 20.4 mg/kg (U.S. Army, 2011). The locations, depths, and analysis results for soil samples collected along the buried piping run were not encountered in the historical information reviewed.

1.8.4.2 The only groundwater quality information available was collected from wells associated with adjacent site FTMM-53. Some wells installed to characterize FTMM-53 are also useful to evaluate the presence and extent of groundwater contamination source at FTMM-68. Specifically, PCE was detected in wells 699MW-9 and 699MW-16 at concentrations of 1.7 to 2.3 µg/L in 2010 (see FTMM-53 site map in **Appendix C-3**). Both of these wells are located hydraulically downgradient of Building 700 at FTMM-68, indicating that dissolved PCE contamination source at Building 700 is migrating downgradient to the southeast, although the migration may have been influenced by the operating pump and treat system at FTMM-53.

1.8.4.3 Soil gas samples were collected in early 2012 to assess VI risks in Building 700. Three sub-slab soil-gas samples, one duplicate sub-slab soil-gas sample, two indoor air samples, and one duplicate indoor air sample were collected at Building 700 (AECOM, 2012). This building was included in the VI site investigation because PCE, TCE, chloroethane, and vinyl chloride were detected at concentrations above their respective GWSL in groundwater samples collected within 100 feet of the building. Soil gas samples collected at Building 700 were analyzed for 12 chlorinated VOCs based on detections of PCE in groundwater from wells 699MW-09 and 699MW-16, the trigger wells for this investigation. However, during the March 2011 groundwater sampling event, PCE was not detected above its GWSL of 1 µg/L in either of these wells, minimizing the concern for VI in the building.

1.8.4.4 The only analyte detected in sub-slab soil-gas samples was PCE, which was detected at a concentration of 24 µg/m^3 at SS-9; this concentration is below the residential and non-residential SGSLs for PCE, which are 34 and 36 µg/m^3, respectively. The reporting limits for non-detect sub-slab soil-gas results were below the residential and non-residential SGSLs.

1.8.4.5 The only analyte detected in an indoor air at Building 700 was chloromethane, which was detected at a concentration of 1 µg/m^3; this concentration is below the residential and non-residential IASLs for chloromethane, which are 95 and 130 µg/m^3, respectively. The

reporting limits for non-detect indoor/ambient/duplicate air results were below the residential and nonresidential IASLs.

1.8.4.6 Based on historical groundwater analytical data and soil gas data collected during the VI investigation, it appears that groundwater was acting as a source for the PCE contamination detected in sub-slab soil gas at Building 700. However, PCE was only detected in one of four sub-slab soil-gas samples (including one duplicate) at a concentration below residential and nonresidential SGSLs, and it was not detected in indoor air. As a result, the VI pathway for PCE and the other targeted chlorinated VOCs at Building 700 was considered incomplete.

Table 1.1
Well Construction Summary

Site	Y Coord. (North)	X Coord. (East)	Installation Date	Depth	Casing Length	Screen Length	Top of Casing Elevation	Slot Size	Comments
				feet				inches	
FTMM-22 (Former CW-1 Lime Pit at Building 2700)									
CW1MW25	533033.506	607133.864	10/12/2010	48.00	38.00	10.00	61.82	0.01	
CW1MW26	532932.459	607087.706	12/19/1994	15.00	5.00	10.00	60.81	0.01	
CW1MW27	532942.541	607079.911	12/19/1994	15.00	5.00	10.00	60.85	0.01	
CW1MW28	532962.814	607087.565	12/19/1994	15.00	5.00	10.00	59.09	0.01	
CW1MW29	532952.804	607110.856	12/19/1994	15.00	5.00	10.00	58.40	0.01	
CW1MW30	532932.459	607094.397	7/13/2000	17.00	7.00	10.00	61.93	0.01	
CW1MW31	532952.948	607141.850	7/17/2000	19.00	4.00	15.00	61.47	0.01	
CW1MW32	532953.165	607188.334	7/17/2000	22.00	7.00	15.00	62.18	0.01	
CW1MW33	532902.608	607196.318	7/17/2000	20.00	5.00	15.00	62.27	0.01	
CW1MW34	533014.201	607257.782	7/17/2000	20.00	5.00	15.00	58.63	0.01	
CW1MW35	532973.908	607296.710	7/18/2000	20.00	5.00	15.00	58.09	0.01	
CW1MW36	533014.490	607319.765	7/18/2000	20.00	5.00	15.00	58.70	0.01	
CW1MW37	532953.850	607335.547	7/18/2000	20.00	5.00	15.00	59.21	0.01	
CW1MW38	532922.196	607056.762	7/11/2000	50.00	30.00	20.00	61.93	0.01	
CW1MW39	533064.217	607133.581	7/10/2000	48.00	28.00	20.00	61.51	0.01	
CW1MW40	532973.221	607149.501	7/14/2000	50.00	30.00	20.00	62.35	0.01	
CW1MW281	532962.886	607103.061	5/2/1996	41.00	31.00	10.00	58.20	0.02	
CW1MW282	533064.253	607141.330	5/2/1996	16.00	6.00	10.00	60.29	0.02	
CW1MW291	532993.640	607188.146	5/3/1996	16.00	6.00	10.00	62.21	0.02	
CW1RW01	532952.768	607103.108	4/17/2001	23.00	5.00	18.00	58.37	0.01	
CW1RW02	532962.814	607087.565	1/4/2002	23.50	8.50	15.00	58.75	0.01	
CW1SP03	532952.804	607110.856	1/4/2002	20.00	18.00	2.00	58.76	0.01	
CW1SP04	532962.850	607095.313	1/4/2002	20.00	18.00	2.00	59.21	0.01	
CW1SPG01	532962.995	607126.304	12/2/1997	22.00	19.00	3.00	58.45	0.02	
CW1SPG02	532962.886	607103.061	12/2/1997	22.00	19.00	3.00	**57.59**	0.02	
CW1SVE-1	532962.995	607126.304	12/2/1997	6.00	4.00	2.00	58.37	0.02	
CW1SVE-2	532962.166	606948.103	12/2/1997	6.00	4.00	2.00	58.60	0.02	
FTMM-53 (Former Gas Station at Building 699)									
600MW01	539100.480	618593.011	7/8/1994	15.00	2.00	13.00	**15.27**	0.02	
616MW01	539282.814	618630.807	8/17/1995	14.00	4.00	10.00	17.64	0.02	Stickup well
699MW01	539094.956	618689.924	11/2/1989	15.00	2.00	13.00	14.48	0.02	
699MW02	539212.459	618724.121	11/2/1989	17.00	2.00	15.00	15.13	0.02	
699MW03	539127.360	618797.755	11/2/1989	15.00	1.50	13.50	15.80	0.02	Abandoned in 2007
699MW04	539111.313	618732.386	11/2/1989	20.00	2.00	18.00	15.03	0.02	
699MW05	539142.503	618894.896	11/30/1989	15.00	3.00	12.00	**13.22**	0.02	
699MW06	539071.235	618810.053	12/1/1989	15.00	2.00	13.00	16.75	0.02	Stickup well
699MW07	unknown	unknown	12/1/1989	15.00	3.00	12.00	15.97	0.02	Abandoned
699MW08	539060.005	618593.218	12/1/1989	15.00	2.00	13.00	14.88	0.02	
699MW09	538950.010	618849.406	5/1/1990	15.00	2.00	13.00	14.70	0.02	
699MW10	unknown	unknown	5/1/1990	14.00	1.00	13.00	15.97	0.02	Abandoned in 1992
699MW12	538918.899	618702.388	10/14/1992	15.00	5.00	10.00	15.50	0.02	
699MW15	539404.555	618692.152	8/17/1995	13.50	3.50	10.00	15.70	0.02	
699MW16	538859.181	618896.350	8/17/1995	13.50	3.50	10.00	15.27	0.02	
699RW03	539070.639	618693.863	10/26/2000	20.00	5.00	15.00	**14.87**	0.01	Road vault
699RW04	538969.453	618694.382	10/26/2000	19.00	4.00	15.00	**15.38**	0.01	
699RW05	539121.709	618786.556	9/18/2007	15.00	4.50	10.00	13.91	0.01	
699RW11	539063.440	618770.989	5/20/1992	20.00	5.00	15.00	**13.13**	0.02	

Table 1.1
Well Construction Summary

Site	Y Coord. (North)	X Coord. (East)	Installation Date	Depth	Casing Length	Screen Length	Top of Casing Elevation	Slot Size	Comments
				feet				inches	
699SP-01	539071.037	618771.324	10/25/2000	20.50	18.00	2.50	**14.89**	0.01	
699SP-02	538969.850	618771.842	10/25/2000	20.20	17.70	2.50	**14.83**	0.01	
699SP-03	539070.639	618693.864	10/25/2000	19.30	16.80	2.50	**15.47**	0.01	
699SP-04	539171.826	618693.345	10/25/2000	19.70	16.20	2.50	**15.23**	0.01	
699SP-05	539075.620	618727.660	10/25/2000	20.20	17.70	2.50	**15.19**	0.01	
699SP-06	539067.150	618696.890	10/26/2000	20.20	17.70	2.50	**15.36**	0.01	
699SP-07	539055.710	618653.480	10/26/2000	19.40	16.90	2.50	**15.70**	0.01	
699SP-08	539060.020	618612.960	10/26/2000	19.40	16.90	2.50	**15.47**	0.01	
699SP-09	539121.828	618809.794	9/18/2007	18.00	16.00	2.00	14.81	0.01	
699SP-10	539152.065	618786.400	9/19/2007	18.00	16.00	2.00	15.09	0.01	
699-VP-10	539101.472	618786.660	9/18/2007	13.00	3.00	10.00	**13.35**	0.01	
699-VP-11	539141.907	618778.706	9/18/2007	13.00	3.00	10.00	14.75	0.01	
"Well 1"	unknown	unknown	2/26/1981	20.00	unknown	unknown	unknown	0.02	
"Well 2"	unknown	unknown	2/26/1981	20.00	unknown	unknown	unknown	0.02	
"Well 3"	unknown	unknown	2/27/1981	20.00	unknown	unknown	unknown	0.02	
"Well 4"	unknown	unknown	2/27/1981	20.00	unknown	unknown	unknown	0.02	
"Well 5"	unknown	unknown	2/27/1981	20.00	unknown	unknown	unknown	0.02	
"Well 6"	unknown	unknown	2/27/1981	20.00	unknown	unknown	unknown	0.02	
FTMM-59 (Former Auto Repair Shop at Building 1122)									
1122MW01	538337.815	617448.396	9/12/1995	18.00	5.00	13.00	**15.04**	0.02	
1122MW02	538372.256	617370.995	9/12/1995	15.00	3.00	12.00	**15.12**	0.02	
1122MW03	538342.086	617406.394	7/20/2000	14.00	4.00	10.00	**13.10**	0.01	
1122MW04	538378.349	617471.597	7/20/2000	14.00	4.00	10.00	**13.54**	0.01	
1122MW05	538393.770	617423.276	7/20/2000	15.00	5.00	10.00	**12.54**	0.01	
1122MW06	538540.000	617520.000	7/20/2010	20.00	5.00	15.00	17.53	0.01	
1122MW07	unknown	unknown	8/17/2011	20.00	5.00	15.00	unknown	0.01	No well tag
1122MW08	unknown	unknown	8/17/2011	20.00	5.00	15.00	unknown	0.01	No well tag
FTMM-68 (Former Dry Cleaners at Building 700)									
565MW01	unknown	unknown	8/16/2011	15.000	5.00	10.00	unknown	0.01	No well tag
565MW01D	unknown	unknown	8/16/2011	23.00	18.00	5.00	unknown	0.01	No well tag

Note:
Bolded top of casing elevations represent a mathematical adjustment between earlier NAD systems and the NAD 88 spatial system; the adjusted monitoring wells will be resurveyed. The elevations were reduced by 1.09 feet to reflect the changes in the NAD systems.

SECTION 2
TECHNICAL MANAGEMENT PLAN

2.1 INTRODUCTION

The purpose of this Technical Management Plan is to provide the approach and procedures that will be used to execute the tasks required to perform an RI/FS for FTMM-22, FTMM-53, FTMM-59, and FTMM-68. Information on the project objectives, organization, personnel, communication and reporting, deliverables, schedule, billing, public relations, duties and responsibilities, and the functional relationship between the different organizations is contained in the PMP (Parsons 2012a). The project objectives are provided below.

2.2 PROJECT OBJECTIVE

The overall objective and purpose of this work plan order is to perform an RI/FS for FTMM-22, FTMM-53, FTMM-59, and FTMM-68. Following completion of the field investigation phase, an RI/FS report will be produced for each site that characterizes the nature and extent of COPCs at the sites, compiles information to fill any data gaps remaining from previous investigations, evaluates the potential risk to human health and the environment, evaluates remedial alternatives, and recommends a preferred alternative. The overall goal of this process is to obtain stakeholder concurrence on the final RI/FS reports, and if warranted, provide sufficient data to facilitate future remedial actions. The RI/FS will be performed in accordance with CERCLA and NJDEP requirements (i.e., N.J.A.C. 7:26E Technical Requirements for Site Remediation and associated guidance) to the extent possible. The specific project objectives are also described in paragraph 1.2.3.

SECTION 3
FIELD INVESTIGATION PLAN

This Field Investigation Plan outlines the specific field activities that Parsons will perform during the RI at FTMM. The purpose of these field activities is to characterize the nature and extent of contamination at the four sites. The Field Investigation Plan includes discussion of the conceptual site models (CSMs) and proposed field data collection activities. Detailed sampling procedures to be used during the field investigation are provided in the SAP (**Appendix E**). This section also includes the approach to FS evaluation of remedial technologies and alternatives. RI field activities will be conducted in accordance with CERCLA and NJDEP requirements (i.e., N.J.A.C. 7:26E Technical Requirements for Site Remediation and associated guidance) to the extent possible.

3.1 CONCEPTUAL SITE MODEL

3.1.1 A CSM is a description of a site and its environment that can be used to depict the nature of potential contamination, its location, and the possible interactions of human and environmental receptors with that contamination. The CSM summarizes which potential receptor exposure pathways for contaminants are (or may be) complete and which are (and are likely to remain) incomplete. An exposure pathway is considered incomplete unless the four following elements are present (USEPA, 1989): (1) a source of contamination; (2) an environmental transport and/or exposure medium; (3) a point of exposure at which the contaminant can interact with a receptor; and (4) a receptor and a likely route of exposure at the exposure point. If any single factor is not present, the pathway is incomplete. An incomplete exposure pathway indicates that there are no current means by which a receptor (human or ecological) can come into contact with contaminants; therefore, no hazards or risks from exposure to contaminants would be expected. This information can be used to focus the investigation of the site by suggesting which complete or potentially complete exposure pathways need to be evaluated. The CSM is a 'living document' that is based on existing knowledge and therefore, can and should be updated throughout the course of the project as more data become available.

3.1.2 For the purposes of this RI/FS, a preliminary CSM was developed for FTMM-22, FTMM-53, FTMM-59, and FTMM-68 in accordance with Engineering Manual (EM) 1110-1-1200. This CSM is presented as a summary table (**Table 3.1**) that indicates the known or suspected contamination sources, the potential/suspected locations and distribution of contamination, the related source or exposure media, the current and future receptors, and the potentially complete exposure pathways. The CSM for each site is also presented as a flow chart that depicts the possible contaminant migration and exposure pathways for the various site receptors (**Figures 3.1 through 3.4**).

3.1.3 The preliminary CSM for Site FTMM-22 (former CW-1 lime pit) indicates that VOCs and metals are present in shallow and deep groundwater at concentrations that exceed NJDEP criteria; however, the elevated metal concentrations are naturally occurring (paragraph 1.8.1.9). The depth to groundwater in the CW-1 area ranges from approximately 6 to 10 feet bgs. Although previous sampling has indicated that VOCs and metals are not COPCs in vadose zone soil at FTMM-22, additional data regarding VOC concentrations in soil near the former

lime pit should be collected because the historical data set is limited and dated. Additional data regarding VOCs in onsite groundwater should be collected to assess current concentrations. Ecological evaluations have concluded that site-related contamination is unlikely to have a deleterious effect on sensitive ecological receptors or habitats, and that additional ecological assessment at this site is not warranted (Shaw, 2011). The nearest downgradient ecological exposure points that may represent potential groundwater discharge areas (Shrewsbury Creek and adjacent wetland) are located approximately 600 feet from the former CW-1 lime pit, and there are no other identified sensitive ecological receptors or habitats in the area that could be impacted by site-related contamination. In addition, based on the available data there is no evidence that contaminants have migrated off-site. Potentially complete exposure pathways are present at the site that might result in residents, intrusive and non-intrusive site workers, site visitors, and recreational users being exposed to VOCs in impacted subsurface soil and groundwater (**Table 3.1**).

3.1.4 The preliminary CSM for FTMM-53 (Building 699) indicates that elevated concentrations of fuel hydrocarbons (BTEX and TPH) were present in soil between Building 699 and Saltzman Avenue to the north in 2001, when soils were last sampled, and may still be present to some degree despite the occurrence of natural attenuation over the past 11 years. In addition, fuel-related VOCs, lead, and low concentrations of chlorinated solvents are present in groundwater at concentrations above the NJDEP GWQS. The depth to groundwater at FTMM-53 ranges from approximately 9 to 10 feet bgs. The likely source of chlorinated solvents in groundwater in the eastern portion of FTMM-53 is attributed to adjacent site FTMM-68 (former dry cleaners), and these chlorinated organics will also be investigated under FTMM-68. Additional soil and groundwater quality data need to be collected to better define the current magnitude and vertical/lateral extent of site-related COPCs in soil and groundwater and the degree to which site groundwater has been impacted by chlorinated VOC contamination sourced at adjacent site FTMM-68. Based on the available data there is no evidence that contaminants sourced at FTMM-53 have migrated off-site. Potentially complete exposure pathways are present at the site that might result in residents, intrusive and non-intrusive site workers, site visitors, and recreational users being exposed to VOCs and/or lead in impacted surface or subsurface soil and groundwater (**Table 3.1**).

3.1.5 The preliminary CSM for FTMM-59 indicates that the site has, for the most part, been adequately characterized and the RI can be completed following some minor additional surficial soil sampling and collection of groundwater samples from two recently installed monitoring wells that have not yet been sampled. Ecological evaluations have concluded that site-related contamination is unlikely to have a deleterious effect on nearby sensitive ecological receptors or habitats in Mill Creek, and that additional ecological assessments related to Building 1122 (FTMM-59) were not warranted (Shaw, 2011). Potentially complete exposure pathways are present at the site that might result in residents, intrusive and non-intrusive site workers, site visitors, and recreational users being exposed to TPH, VOCs, SVOCs/PAHs, and/or lead in impacted surface or subsurface soil and/or groundwater (**Table 3.1**).

3.1.6 The preliminary CSM for FTMM-68 indicates that impacts to soil and groundwater resulting from releases from the former solvent UST at Building 700 have not been adequately characterized. The depth to groundwater believed to be similar to FTMM-53 which ranges from approximately 9 to 10 bgs. The lateral and vertical extent of contamination needs to be better defined, and the presence of low-permeability zones that could influence vertical

migration of contaminants needs to be assessed. Sampling data for adjacent site FTMM-53 indicates that this site has been impacted by chlorinated solvent contamination sourced at FTMM-68 due to the hydraulic influence of the pump and treat system at FTMM-53. Potentially complete exposure pathways are present at the site that might result in residents, intrusive and non-intrusive site workers, site visitors, and recreational users being exposed to VOCs in impacted surface or subsurface soil and groundwater (**Table 3.1**).

3.1.7 These CSMs were used to focus the development of the general technical approach for this investigation, a summary of which is also included as part of the CSM Summary Table (**Table 3.1**; also discussed in Section 3.2 below). As this table demonstrates, the sampling approach was developed specifically to evaluate each of the potentially complete exposure pathways identified in the preliminary CSM.

3.1.8 The CSM for each site will be revised as appropriate based on investigation results and USACE, FTMM, and regulatory feedback. As more data are gathered at the project site, any updated versions will be presented in subsequent submittals, such as the RI/FS report.

Table 3.1
Overview of Preliminary Conceptual Site Models and Remedial Investigation Technical Approach
Fort Monmouth, New Jersey

SITE DETAILS	PRELIMINARY CONCEPTUAL SITE MODEL SUMMARY					REMEDIAL INVESTIGATION TECHNICAL APPROACH			
	Known or Suspected Contamination Source(s)	**Location and Extent of Contamination**	**Source or Exposure Medium: COPCs**	**Current and Future Receptors**	**Potentially Complete Exposure Pathways**	**Investigation Method**	**Investigation Location(s)**	**Proposed Samples/Tests**	**Decision Rule(s)**
NAME: FTMM-22 (Former CW-1 Lime Pit at Building 2700) **Historical Land Use:** Former Wastewater Treatment lime pit measuring ~ 10 ft x 20 ft used to treat acidic liquid wastes produced in the laboratories of adjacent building 2700. **Current Land Use:** Courtyard of Building 2700 which is used for administrative functions **Future Land Use:** Unknown	FTMM-22 is located in the courtyard of Building 2700 which was constructed in 1952. The site consists of a former wastewater treatment lime pit that was used to pre-treat acidic liquid wastes produced in the laboratories in Building 2700. Liquid wastes disposed in the former lime pit, included alkaline cleaning agents, high concentrations of (hexavalent) chromium that were likely present in rinse water from a chrome plating operation, 93-94 percent sodium hydroxide slugs, sulfuric acid that was likely a dip solution used to activate a metal surface for plating, copper pickling waste, sodium dichromate as part of a cleaning agent, parabenzoquinone that was likely from photographic processing effluent, ammonium persulfate from the printed circuit manufacturing shop, and acetone. The lime pit was decommissioned in 2001.	Previous soil sampling detected VOCs in soil. Groundwater sampling has detected localized VOC plumes; elevated metal concentrations detected in groundwater are representative of natural background conditions.	Subsurface soil: VOCs Groundwater: VOCs	Residents, intrusive workers, non-intrusive workers, and occasional users (visitors, recreational)	Incidental ingestion of subsurface soil and groundwater, dust inhalation, dermal contact with subsurface soil and groundwater by intrusive workers. Inhalation of volatiles from subsurface soil and groundwater by residents, intrusive and non-intrusive workers, site visitors, and recreational users. Residential use of groundwater as a potable water source.	Collect discrete subsurface soil samples for laboratory analysis using direct push techniques. Collect groundwater samples for laboratory analysis from existing monitoring wells using low-flow sampling procedures. Perform slug tests in selected monitoring wells.	Collect soil samples adjacent to the former CW-1 lime pit and groundwater samples in selected existing monitoring wells	Three soil borings will be advanced adjacent to the NE and SE borders of the former CW-1 lime pit. Up to three soil samples will be collected from each boring (maximum total of nine samples). Groundwater samples will be collected from three existing monitoring wells (additional wells to be sampled as part of a separate groundwater monitoring task). Slug tests will be performed in four existing monitoring wells.	If field evidence of contamination is not noted, soil samples will be collected from the 2-foot interval immediately above the water-table (estimated to be present at a depth of approximately 8 feet bgs), and from 18 to 20 feet bgs or just above the top of the aquitard that forms the base of the shallow water-bearing zone, whichever is more shallow. Surface soil (0 to 2 feet bgs) will not be sampled unless there is field evidence of contamination due to the fact that releases occurred from an underground pit. If there is visual or olfactory evidence of contamination and/or elevated PID headspace readings, then a third sample will be collected from what appears to be the most contaminated interval intercepted by the boring. The analytical results will be used during the FS to evaluate remedial alternatives for the site.

Table 3.1
Overview of Preliminary Conceptual Site Models and Remedial Investigation Technical Approach
Fort Monmouth, New Jersey

SITE DETAILS	PRELIMINARY CONCEPTUAL SITE MODEL SUMMARY					REMEDIAL INVESTIGATION TECHNICAL APPROACH			
	Known or Suspected Contamination Source(s)	**Location and Extent of Contamination**	**Source or Exposure Medium: COPCs**	**Current and Future Receptors**	**Potentially Complete Exposure Pathways**	**Investigation Method**	**Investigation Location(s)**	**Proposed Samples/Tests**	**Decision Rule(s)**
NAME: FTMM-53 (Former Gas Station at Building 699) **Historical Land Use:** Former automobile service station with former gasoline USTs, pump islands, and associated piping. **Current Land Use:** Unused; Building is intact **Future Land use:** Unknown	Six 10,000 gallon USTs and two pump islands. A tank tightness test performed in 1984 identified a 0.333 gallon per hour leak in two of the USTs. In 1989, approximately 11,000 gallons of gasoline were released. The release was attributed to a leak in the product piping between the USTs and the fuel pump dispensers and the piping was excavated and replaced. The six USTs were removed in 2007 and replaced with two 10,000 gallon ASTs. Minor fuel spills may have occurred at the fueling islands, therefore surface and subsurface soil may have been impacted at this site. Chlorinated organics in the eastern portion of the site are also being investigated under FTMM-68.	BTEX, TBA, PCE, TCE, and several metals have recently been detected in groundwater at concentrations exceeding NJDEP GWQS, and BTEX and TPH were detected in soil at concentrations greater than NJDEP RDCSCC. PCE and TCE are likely sourced at adjacent site FTMM-68. A pump and treat system is hydraulically controlling the plume. With the exception of lead, which is potentially site-related, elevated metal concentrations in groundwater are believed to be representative of natural background conditions.	Soil: VOCs Groundwater: VOCs, lead	Residents, intrusive workers, non-intrusive workers, and occasional users (visitors, recreational)	Incidental ingestion of surface and subsurface soil and groundwater, dust inhalation, dermal contact with subsurface soil and groundwater by intrusive workers. Inhalation of volatiles from surface and subsurface soil and groundwater by residents, intrusive and non-intrusive workers, site visitors, and recreational users. Residential use of groundwater as a potable water source.	Collect discrete soil samples using direct push techniques or hand auger (if necessary below canopy due to access restrictions). Collect groundwater samples from existing and new monitoring wells using low-flow sampling procedures. Perform slug tests in selected monitoring wells.	1) north of Saltzman Ave 2) at selected locations containing elevated fuel hydrocarbon concentrations in 2001 3) beneath the fuel islands canopy Samples from new monitoring wells to be installed east and south of Building 699 to assess lateral extent of site-related contamination	Two borings north of Saltzman Ave, four borings at locations containing elevated fuel hydrocarbon concentrations in 2001, and three borings beneath the canopy; three soil samples collected per boring. Two groundwater samples will be collected from new monitoring wells. (additional wells to be sampled as part of a separate groundwater monitoring task) Slug tests will be performed in two existing wells and one new well.	Soil borings will be advanced to a target depth of 15 feet bgs, through and below any fuel smear zone bordering the water-table that may have resulted from the past presence of free product. Three samples per boring will be collected based on field observations of contamination and PID headspace screening. If there is no indication of contamination at a boring location, then one sample will be collected from the top 2 feet of the native soil column beneath the pavement (0.5 to 2.0 feet below top of soil surface), one sample will be collected from the two-foot interval just above the water-table (estimated to be present at approximately 9-10 feet bgs), and one sample will be collected from 13 to 15 feet bgs. If there is field evidence of significant fuel contamination at 15 feet bgs (e.g., soil staining, fuel odor) then the boring will be advanced to a maximum depth of 20 feet bgs to define the vertical extent of the contamination, and the third soil sample will be collected from a deeper interval. If there are indications of soil contamination at a boring location (visual, olfactory, PID screening) then the sample intervals will be 0.5 to 2.0 feet bgs, near the bottom of the boring to delineate vertical extent, and from the most contaminated interval encountered based on field screening. The analytical results will be used during the FS to evaluate remedial alternatives for the site.

Table 3.1
Overview of Preliminary Conceptual Site Models and Remedial Investigation Technical Approach
Fort Monmouth, New Jersey

SITE DETAILS	PRELIMINARY CONCEPTUAL SITE MODEL SUMMARY					REMEDIAL INVESTIGATION TECHNICAL APPROACH			
	Known or Suspected Contamination Source(s)	**Location and Extent of Contamination**	**Source or Exposure Medium: COPCs**	**Current and Future Receptors**	**Potentially Complete Exposure Pathways**	**Investigation Method**	**Investigation Location(s)**	**Proposed Samples/Tests**	**Decision Rule(s)**
NAME: FTMM-59 (Former Auto Repair Shop at Building 1122) Suspected Past DoD Activities: Vehicle Maintenance Shop, Paint Stripping, Former USTs **Current Land Use**: Currently unused, Building is intact **Future Land Use**: Unknown	FTMM-59 is associated with Building 1122. Several sources of contamination were previously identified, including a former #2 fuel oil UST and associated piping, a former waste oil UST, two failed hydraulic lifts, a former release of transformer oil associated with a toppled electrical pole, a chemical storage shed, and a paint booth/shed. USTs have been removed, and there have been several site characterization and soil excavation events to characterize and remove contaminated soil (see Section 1.8.3).	Soil at the failed hydraulic lifts in service bays #10 and #12 contained concentrations of TPH exceeding the NJDEP SCC. In addition, elevated SVOC/PAH and/or lead concentrations are present in surface soil (0 to 6 inches bgs) adjacent to the Chemical Storage Shed and Paint Booth/Shed. Other soil contamination in the vadose zone is either below NJDEP SCC or has been removed via excavation. BTEX concentrations were detected in soil below the water table at Geoprobe boring GW21 near the NW corner of Building 1122.	Soil: SVOCs/PAHs, lead, TPH, BTEX Groundwater: to be determined based on sampling of two recently installed monitoring wells	Residents, intrusive workers, non-intrusive workers, and occasional users (visitors, recreational)	Incidental ingestion of surface and subsurface soil and groundwater, dust inhalation, dermal contact with subsurface soil and groundwater by intrusive workers. Inhalation of volatiles from surface and subsurface soil and groundwater by residents, intrusive and non-intrusive workers, site visitors, and recreational users. Residential use of groundwater as a potable water source.	Collect discrete soil samples using direct push techniques or hand auger. Collect groundwater samples from two monitoring wells recently installed near the Chemical Storage Shed and Paint Booth/Shed	The area immediately surrounding the Chemical Storage Shed and Paint Booth/Shed. TPH contamination in soil at service bays #10 and #12 has been sufficiently characterized and additional soil sampling is not required. BTEX contamination in soil below the water-table at Geoprobe boring GW21 is localized.	Four shallow soil samples from two borings advanced near the Chemical Storage Shed and Paint Booth/Shed. One groundwater sample from each of two monitoring wells installed near the Chemical Storage Shed and Paint Booth/Shed	The available groundwater data will be used during the FS to determine whether MNA is the appropriate alternative for site groundwater. At each soil boring location, soil samples for laboratory analysis will be collected from 0 to 0.5 feet bgs and 1.5 to 2 feet bgs. The analytical results will be used during the FS to evaluate remedial alternatives for this portion of the site.
NAME: FTMM-68 (Former Dry Cleaners at Building 700) Suspected Past DoD Activities: Former solvent UST **Current Land Use**: Currently unused, Building is still intact **Future Land Use**: Unknown	FTMM-68 encompasses Building 700 on the MP. Building 700 is a former dry cleaning facility that used chlorinated solvents (PCE/TCE). FTMM personnel excavated a 500 gallon UST in 2011. The tank was observed to be heavily corroded and leaking in several places. Approximately 450 gallons of impacted water was removed and drummed, along with soil that appeared to be impacted by VOCs.	Soil samples collected from the solvent tank excavation detected contamination at the bottom of the excavation (7.5 feet bgs) and beneath the tank piping run (2.5 feet bgs) exceeded the NJDEP RDCSRS for PCE. Soil samples collected from the base of each sidewall met NJDEP RDCSRS for PCE. Impacts to groundwater have not been characterized at this site.	Soil: VOCs Groundwater: VOCs	Residents, intrusive workers, non-intrusive workers, site visitors and occasional users (visitors, recreational).	Incidental ingestion of surface and subsurface soil and groundwater, dust inhalation, dermal contact with subsurface soil and groundwater by intrusive workers. Inhalation of volatiles from surface and subsurface soil and groundwater by residents, intrusive and non-intrusive workers, site visitors, and recreational users. Residential use of groundwater as a potable water source.	Collect discrete soil samples using direct push techniques. Collect groundwater samples from existing and new monitoring wells using low-flow sampling procedures and groundwater grab samples collected using direct push groundwater sampling device and a peristaltic pump. Perform slug tests in selected monitoring wells.	At the location of the former solvent UST that was located at or near the southeast corner of Building 700 Crossgradient and downgradient of the former solvent UST that was located at or near the southeast corner of Building 700 (groundwater grab sampling points and new and existing monitoring wells).	Up to 15 soil samples from up to five borings advanced near the former UST and tank piping run Up to 12 groundwater grab samples collected from the shallow and deep water-bearing zones; groundwater samples from an estimated two existing monitoring wells installed near the south wall of Building 700 prior to FTMM closure but never sampled; and up to four new RI wells to be installed at as yet undetermined locations and depths. Slug tests will be performed in four existing and/or new monitoring wells.	At each soil boring location, soil samples for laboratory analysis will be collected from 0.5 to 2 feet bgs, just above the water-table, and just above the top of the shallowest aquitard that would inhibit downward migration of contaminants and form the base of the shallow water-bearing zone. However, if PID headspace readings indicate the presence of more significant contamination in another interval, one of the two deeper (subsurface) soil samples will be collected from the apparent zone of maximum contamination instead. Two soil borings will be reserved for "step-out" locations to determine the lateral extent of contamination identified at the first three borings based on PID screening results (if necessary). Following evaluation of the results of the initial 6 groundwater grab samples and low-flow sampling of 2 existing wells, up to 6 additional rapid turnaround groundwater grab samples will be collected to further define the plume in the shallow zone as necessary, and to determine the vertical extent of chlorinated solvent contamination. Care will be taken to avoid penetrating any aquitard that may be present between the shallow and deeper water-bearing zones in an area where DNAPL may be present to avoid vertical migration of DNAPL from the shallow zone to deeper zones. The locations of new RI wells will be based on the data collected from groundwater grab samples and existing monitoring wells. The analytical results will be used during the FS to evaluate remedial alternatives for the site.

3.2 GENERAL TECHNICAL APPROACH

This section describes the general sequence of execution and activities that Parsons will use to successfully complete field operations during this project. This general technical approach was presented in Parsons' proposal for this contract and approved through the award of the contract. In some instances, modifications to the technical approach presented in Parsons' proposal were made following review of additional information obtained during preparation of this work plan. The detailed field procedures to be used for the activities described in the following technical approach are described in the SAP (**Appendix E**). The RI data will be used to support site closure or evaluation (in the planned FS) of potential corrective actions at each site.

3.2.1 RI Sampling Plan

3.2.1.1 FTMM-22 (Former CW-1 Lime Pit at Building 2700)

3.2.1.1.1 The primary objectives of the RI field work at Site FTMM-22 will be to:

- Assess current VOC concentrations in soil beneath and adjacent to the former CW1 lime pit;
- Determine current concentrations of VOCs in groundwater that have exceeded site-specific criteria in the past; and
- Determine the hydraulic conductivity of the water-bearing zones that have potentially been impacted by site-related contamination.

The specific activities that will be performed to meet these objectives are described in the following paragraphs.

3.2.1.1.2 Historical soil sampling data summarized in Section 1.8.1 indicate that VOCs are the only COPCs at Site FTMM-22. The only site-related occurrence of VOCs in soil was TCE at 7.8 mg/kg in the 18.8 to 19.4 foot interval of well bore MW-281, located just north of the former lime pit. The current NJDEP RDCSRS for TCE is 7 mg/kg. Concentrations of antimony, arsenic, and lead exceeded their respective GWQS in shallow and/or deep groundwater samples collected in 2010; however, they are representative of natural background conditions (paragraph 1.8.1.9).

3.2.1.1.3 The RI soil sampling activities will focus on assessing current concentrations of VOCs based on information presented in paragraph 1.8.1.9. Three soil borings will be advanced to a depth of 20 feet bgs adjacent to the northeast, southeast, and southwest edges of the former CW-1 lime pit (**Figure 3.5**). Two to three soil samples will be collected from each boring for laboratory analysis of VOCs and volatile organic TICs as described below and summarized in **Table 3.2**. If field evidence of VOC contamination is not noted, soil samples will be collected from the 2-foot interval immediately above the water-table (estimated to be present at a depth of approximately 8 feet bgs), and from 18 to 20 feet bgs or just above the top of the aquitard that forms the base of the shallow water-bearing zone (paragraph 1.5.4.1.1), whichever is more shallow.

Table 3.2
Soil and Groundwater Sampling Summary for FTMM-22, FTMM-53, and FTMM-68

Site	Location	Field Meter Readings [a/]	VOCs [b/]	VOC TICs [c/]	SVOCs	SVOC TICs	Metals Suite [d/]	VOCs with Rapid Turnaround [e/]
Soil								
FTMM-22	3 New Locations (3 intervals at each location)	9	9	9	--	--	--	-- [f/]
FTMM-53	9 New Locations (3 intervals at each location)	27	27	27	--	--	--	--
FTMM-59	2 New Locations (2 intervals at each location)	4	--	--	4	4	4	--
FTMM-68	Up to 5 New Locations (3 intervals at each location)	15	15	15	--	--	--	--
QA/QC samples [g/] (see SAP for additional details)								
Field Duplicates (5% Sampling Frequency)		NA [h/]	3	3	1	1	1	--
Matrix Spike (5% Sampling Frequency)		NA	3	3	1	1	1	--
Matrix Spike Duplicate (5% Sampling Frequency)		NA	3	3	1	1	1	--
QA Split (5%)		NA	3	3	1	1	1	--
Equipment (Field) Blank (10% of Total Samples)		NA	6	6	1	1	1	--
Groundwater								
FTMM-22	CW1MW-028	1	1	--	--	--	--	--
FTMM-22	CW1MW-029	1	1	--	--	--	--	--
FTMM-22	CW1MW-281	1	1	--	--	--	--	--
FTMM-53	2 New Locations	2	2	2	--	--	2	--
FTMM-59	2 recently installed wells near Paint/Chemical Storage Sheds	2	2	2	2	2	2	--
FTMM-68	Existing Wells	2	--	--	--	--	--	2
FTMM-68	Direct Push Grab Samples	12	--	--	--	--	--	12
FTMM-68	New Wells [i/]	4	4	4	--	--	--	--
QA/QC samples (see SAP for additional details)								
Field Duplicates (5% Sampling Frequency)		NA	1	1	1	1	1	--
Matrix Spike (5% Sampling Frequency)		NA	1	1	1	1	1	--
Matrix Spike Duplicate (5% Sampling Frequency)		NA	1	1	1	1	1	--
Trip Blank (1 per cooler of VOCs)		NA	TBD [j/]	TBD	NA	NA	NA	--
QA Split (5%)		NA	1	1	1	1	1	--
Equipment (Field) Blank (1 Every day)		NA	TBD	TBD	TBD	TBD	TBD	--
TOTAL		**NA**	**84**	**81**	**15**	**15**	**17**	**14**

[a/] Field meter readings include: in both soil and rapid turnaround groundwater samples: photoionization detector (PID) headspace readings, and in groundwater: pH, temperature, electrical conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity.

[b/] VOC = volatile organic compounds.

[c/] TICs = tentatively identified compounds. TICs at FTMM-53 will include 1,2-dibromomethane and 1,2-dichloroethane.

[d/] Metals analysis includes: antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, selenium, thallium, and mercury; soil samples from FTMM-59 will only be analyzed for total lead and groundwater samples from FTMM-53 will only be analyzed for total and dissolved lead.

[e/] Samples will be analyzed for VOC using rapid turnaround (24-48 hours).

[f/] "--" indicates no samples proposed.

[g/] QA/QC = quality assurance/quality control.

[h/] NA = not applicable.

[i/] Location and depth of new wells to be determined based on rapid turnaround data from 3 existing wells and 12 direct push points.

[j/] TBD = to be determined.

3.2.1.1.4 Surface soil (0 to 2 feet bgs) will not be sampled unless there is field evidence of contamination due to the fact that releases occurred from an underground pit. If there is visual or olfactory evidence of contamination and/or elevated PID headspace readings, then a third sample will be collected from what appears to be the most contaminated interval intercepted by the boring.

3.2.1.1.5 Groundwater in deep monitoring well CW1MW-281 and shallow monitoring wells CW1MW-028 and -029 will be sampled for VOCs to evaluate the current status of previously elevated concentrations of TCE. The field parameters pH, temperature, electrical conductivity, dissolved oxygen (DO), and oxidation-reduction potential (ORP) will be measured during well purging. Locations of these wells are shown on **Figure 3.5**. Prior to groundwater sampling, a synoptic round of groundwater depth measurements will be obtained in wells installed at FTMM-22.

3.2.1.1.6 Review of historical documents has indicated that the hydraulic conductivity of the shallow and deep water-bearing zones has not been adequately determined via aquifer testing. Therefore, slug tests will be performed in two shallow and two deep monitoring wells using the procedure described in the SAP. The shallow wells targeted for slug testing include CW1-MW29 and -MW291 The deep wells targeted for slug testing include CW1-MW281 and -MW40 (**Figure 3.5**).

3.2.1.2 FTMM-53 (Former Gas Station at Building 699)

3.2.1.2.1 The primary objectives of the RI field work at Site FTMM-53 will be to:

- Define the extent of soil contamination at the site to the north;
- Determine current concentrations of COPCs in areas where they were elevated in the past;
- Define the extent of chlorinated solvent contamination in shallow groundwater; and
- Determine the hydraulic conductivity of the shallow water-bearing zone that has been impacted by fuel-related contamination.

The specific activities that will be performed to meet these objectives are described in the following paragraphs.

3.2.1.2.2 Two soil borings will be drilled on the north side of Saltzman Avenue to determine the northern extent of elevated COPC concentrations in soil (**Figure 3.6**). Soil samples collected in 2000 and 2001 indicated the presence of elevated concentrations near the southern edge of this road. Three soil borings will be drilled in the vicinity of the fueling islands beneath the canopy to assess COPC concentrations in an area which has not previously been characterized in detail and to characterize soil quality in areas where minor surface spills may have occurred during vehicle refueling activities. Four soil borings will be drilled at locations that had elevated benzene concentrations in soil in 2001 following the enzyme-enhanced bioremediation injection (former boring locations 2, 13, 14, and 47, which had maximum benzene concentrations in 2001 of 45 mg/kg, 100 mg/kg, 38 mg/kg, and 47 mg/kg, respectively (**Figure 3.6**). The purpose of these four borings is to assess the degree to which fuel hydrocarbon concentrations have attenuated since 2001. Soil borings will be advanced to an estimated target depth of 15 feet bgs, through and below any fuel smear zone bordering the

water-table that may have resulted from the past presence of free product. Three samples per boring will be collected based on field observations of contamination and PID headspace screening. If there is no indication of contamination at a boring location, then one sample will be collected from the top 2 feet of the native soil column beneath the pavement (0.5 to 2.0 feet below top of soil surface), one sample will be collected from the two-foot interval just above the water-table (estimated to be present at approximately 9-10 feet bgs), and one sample will be collected from 13 to 15 feet bgs. If there is field evidence of significant fuel contamination at 15 feet bgs (e.g., soil staining, fuel odor) then the boring will be advanced to a maximum depth of 20 feet bgs to define the vertical extent of the contamination, and the third soil sample will be collected from a deeper interval. If there are indications of soil contamination at a boring location (visual, olfactory, PID screening) then the sample intervals will be 0.5 to 2.0 feet bgs, near the bottom of the boring to delineate vertical extent, and from the most contaminated intermediate interval encountered based on field screening.

3.2.1.2.3 Soil samples will be analyzed for VOCs and volatile organic TICs (including 1,2-dibromomethane and 1,2-dichloroethane) (**Table 3.2**). Lead will not be targeted for analysis given that sampling of soil for lead in 2000 did not detect any exceedances of the 400-mg/kg RDCSCS (paragraph 1.8.2.3). Extractable petroleum hydrocarbons (EPH) and naphthalenes will not be targeted for analysis because there was no evidence of contamination associated with the former No. 2 fuel oil UST. Additional soil samples will not be collected at the former waste oil UST based on information presented in paragraph 1.8.2.1.

3.2.1.2.4 One shallow monitoring well will be installed southeast of Building 700 to assess the crossgradient (eastern) extent of PCE detected in wells 699MW-9 and 699MW-16 (**Figure 3.7**). However, this well will not be installed until the extent of the chlorinated solvent plume at adjacent Site FTMM-68 (Building 700) has been characterized. In this way, the location of the new well can be optimized both laterally and vertically to support the RIs at both FTMM-53 and FTMM-68. A second shallow monitoring well will be installed south of Building 699 to assess the downgradient (southern) extent of TCE and PCE detected in source area well 699RW-11 given that former well 699MW-10 has been abandoned. Chlorinated VOCs were not detected in downgradient well 699MW-12. Historical monitoring data for abandoned well 699MW-10 could not be located. The wells will have 10-foot-long screens placed in the shallow water-bearing zone from approximately 7 to 17 feet bgs. However, the screen depths may be revised based on RI results from adjacent site FTMM-68 (the likely source of the chlorinated VOCs in groundwater at FTMM-53). Groundwater samples from the two new wells will be analyzed for VOCs, volatile organic TICs, and lead (total and dissolved). In addition, pH, temperature, electrical conductivity, DO, and ORP will be measured during well purging. The elevations and horizontal coordinates of the two new wells will be surveyed, and the survey will be tied into selected existing wells. Selected additional monitoring wells present at the site will be sampled as part of a facility-wide groundwater monitoring task as described in the *Long-Term Monitoring Groundwater Work Plan for Remedial Investigation / Feasibility Study / Decision Documents* (Parsons, 2012b); these data will be combined with RI data in the RI report. Prior to groundwater sampling, a synoptic round of groundwater depth measurements will be obtained in wells installed at FTMM-53 and FTMM-68 to support creation of a combined potentiometric surface map for these sites.

3.2.1.2.5 Available information indicates that other metals in site groundwater besides lead are not site-related COPCs, as detailed below. Therefore, RI groundwater samples will not be analyzed for other metals besides lead.

- The only potential source of metals contamination at FTMM-53 is the former waste oil UST. Groundwater samples from monitoring well 699MW-12, which was installed at the former waste oil UST location, did not contain metal concentrations exceeding NJDEP GWQS in 2010 (the most recent year during which sampling was conducted). This is the only well that is properly positioned to detect contamination sourced at the former waste oil UST;
- Only one site well (699MW-6) contained a concentration of chromium that exceeded the 70-µg/L GWQS in 2010, and the detected concentration (104 µg/L) was substantially below the maximum MP background concentration for chromium presented by Weston (1995) (191 µg/L);
- Detected concentrations of antimony and arsenic that exceeded their respective GWQS in 2010 were detected hydraulically upgradient to crossgradient of the former waste oil UST and were less than their maximum MP background concentrations presented in Weston (2005);
- Detected concentrations of beryllium, cadmium, nickel, and selenium that exceeded their respective GWQS and maximum MP background concentrations (Weston, 1995) in 2010 were detected hydraulically upgradient and distant from the former waste oil UST. Concentrations of these metals were generally only slightly higher than the GWQS and/or maximum background levels with the exception of those detected in samples from 699RW-03 and 699RW-11 that were not collected using low-flow, minimal disturbance methods and are likely biased high due to sample turbidity; and
- As described in Brinkerhoff (2011), concentrations of various metals exceeding GWQS have been detected in groundwater across FTMM and appear to be representative of a combination of a naturally-occurring, dissolved component and input from sample turbidity.

3.2.1.2.6 Review of historical documents has indicated that the hydraulic conductivity of the shallow and deep water-bearing zones has not been adequately determined via aquifer testing. Therefore, slug tests will be performed in three site monitoring wells using the procedure described in the SAP. The wells targeted for slug testing include 699RW-4, 699RW-11, and the new well planned for installation near abandoned well 699MW-10 (**Figure 3.7**).

3.2.1.3 FTMM-59 (Former Vehicle Maintenance Shop at Building 1122)

3.2.1.3.1 The primary objectives of the RI field work at Site FTMM-53 will be to define the vertical and lateral extent of SVOCs/PAHs and lead detected in surface soil adjacent to the Chemical Storage Shed and Paint Booth/Shed in 2010. It is possible that the detected SVOC/PAH and lead concentrations are due to runoff from the adjacent pavement, and/or from the sheds themselves (if their exteriors are painted with lead-based paint). The vanadium concentrations detected from 5 to 6 feet bgs (maximum 82.1 mg/kg) in 2010 are only slightly higher than the NJDEP RDCSRS (78 mg/kg) and are not believed to be site-related. The

detected vanadium concentrations are lower than the maximum background concentration for FTMM of 94.1 mg/kg reported by Weston (1995).

3.2.1.3.2 The elevated TPH concentrations detected at the failed hydraulic lifts in Building 1122 Service Bays #10 and #12 appear to be localized and additional soil sampling is not required during the RI to support the FS. The elevated BTEX concentrations detected in soil at a depth of 10 feet bgs at former Geoprobe boring location GW21 just north of Building 1122 are below the water-table and do not require an additional investigation to meet the objectives of the RI/FS. Soil in this area was previously excavated to a depth of 8 feet bgs (the approximate water-table). The specific activities that will be performed to meet the stated objective are described in the following paragraphs.

3.2.1.3.3 Two soil borings will be advanced to a depth of 2 feet bgs at the locations shown on **Figure 3.8** using a direct push rig or hand auger. Two soil samples will be collected at each boring location from 0 to 0.5 feet and 1.5 to 2 feet bgs. The samples will be analyzed for SVOCs (including PAHs), SVOC TICs, and lead. The sample locations will be manually documented in the field in relation to the sheds using a tape measure. The eastern extent of near-surface lead contamination detected in boring B-1 at the east edge of the Paint Booth/Shed in 2010 is limited because the soil excavation performed in 1995 extended very close to the eastern edge of this shed (**Figure 3.8**). Therefore, advancement of a step-out soil boring east of B-1 is not planned.

3.2.1.3.4 A groundwater sample will be collected from each of the two new monitoring wells recently installed near the Chemical Storage Shed and Paint Booth/Shed. The samples will be analyzed for VOCs + TICs, SVOCs + TICs, and a suite of 12 metals including antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, and thallium. Groundwater at selected other wells at FTMM-59 will continue to be sampled as part of routine long-term monitoring at FTMM (Parsons, 2012b).

3.2.1.3.5 As described in Section 1.8.3, the Final Basewide Ecological Evaluation Report (Shaw, 2011) concluded that constituents at Building 1122 (FTMM-59) and Parcel 43 are unlikely to have a deleterious effect on sensitive ecological receptors or habitats, and additional ecological assessments related to this site were not warranted or recommended. Therefore, additional surface water and sediment sampling will not be performed during the RI. In addition, collection of additional vapor samples to support a vapor intrusion evaluation is not planned because AECOM (2012) concluded that a follow-on VI investigation was not required at Building 1122 because this building is located outside of the critical distance (i.e., 100 feet or 30 feet, depending on the contaminant) recommended by the NJDEP (2012a) VI Guidance.

3.2.1.4 FTMM-68 (Former Dry Cleaners at Building 700)

3.2.1.4.1 The existing monitoring wells (estimated quantity of two) installed along the southern side of Building 700 in 2011 (**Figure 3.9**) but never sampled (see paragraph 1.6.4.2) will be developed (if not done already) and sampled for VOCs using standard low-flow methods with samples analyzed on a rapid turnaround (24 to 48 hour) basis (**Table 3.2**). In addition, the most recent sampling data for monitoring wells associated with adjacent site FTMM-53 (Building 699) will be reviewed because some wells (especially 699MW-16 and 699MW-9) are located potentially downgradient of Building 700.

3.2.1.4.2 In addition to sampling the existing monitoring wells as described above, six shallow groundwater grab samples will initially be collected hydraulically downgradient of the former 500-gallon UST at FTMM-68 using direct push techniques to rapidly characterize groundwater quality in the shallow water bearing zone. The approximate locations of these six initial grab samples are shown on **Figure 3.9**. Continuous soil samples will be collected from each of the borings for visual observation, field PID headspace screening, and geologic logging purposes. The shallow groundwater grab samples will be collected from an estimated depth of 15 feet bgs (approximately 5 feet below the water-table), and will be submitted for rapid turnaround (24 to 48 hour) analysis of VOCs. The rapid turnaround data for the (estimated) two existing monitoring wells and the six shallow groundwater grab samples will be used to determine the extent of the plume in the shallow zone and whether DNAPL may be present. Given the relatively low concentrations of PCE in groundwater at wells associated with FTMM-53, DNAPL is not anticipated to be present.

3.2.1.4.3 Following evaluation of the initial groundwater quality data described in the previous two paragraphs, up to six additional rapid turnaround groundwater grab samples will be collected using direct push techniques to further define the plume in the shallow zone as necessary, and to determine the vertical extent of chlorinated solvent contamination. Care will be taken to avoid penetrating any aquitard that may be present between the shallow and deeper water-bearing zones in any area where DNAPL could possibly be present to avoid vertical migration of DNAPL from the shallow zone to deeper zones. The locations of these remaining six groundwater grab samples will be determined following review of grab sample results described above. Continuous soil samples will be collected from each boring for visual observation, field PID screening, and geologic logging. Deep groundwater grab samples will be collected from an estimated depth between 30 and 40 feet bgs, if the aquitards are present from approximately 18 to 25 feet bgs and below 41 feet bgs, as has been described for FTMM-22 (see paragraph 1.5.4.1). However, the appropriate sampling depths will be evaluated during visual examination of soil samples collected during borehole advancement, and adjusted as necessary.

3.2.1.4.4 Groundwater from the grab sampling points and the (estimated) two wells installed along the southern edge of Building 700 will also be field screened with a PID using the headspace method described in the SAP. This screening will provide an immediate, semi-quantitative assessment of total VOC concentrations, and will help guide the optimal location of subsequent grab sampling points.

3.2.1.4.5 After groundwater impacts have been characterized by the method described above, up to four new monitoring wells will be installed at FTMM-68 to further characterize impacts to groundwater in shallow and deeper water-bearing zones (i.e., nature, magnitude, and lateral/vertical extent of contamination) and to supplement the existing monitoring well network. The locations and depths of the wells will be determined following review of data from the groundwater grab sampling task and sampling of the (estimated) two existing wells installed along the southern edge of Building 700. The goal of the well installation will be to definitively document the magnitude and lateral/vertical extent of chlorinated solvent contamination in groundwater. Each new well will be developed, and groundwater samples will be collected from each monitoring well and analyzed for VOCs and volatile organic TICs. In addition, pH, temperature, electrical conductivity, DO, and ORP will be measured during well purging. It is unlikely that other substances apart from chlorinated solvents were stored in the former UST

given the function of the site as a dry cleaners; therefore, other parameters will not be targeted for analysis. The elevations and horizontal coordinates of the new wells will be surveyed as described in the SAP, and the survey will be tied into selected existing wells. Prior to groundwater sampling, a synoptic round of groundwater depth measurements will be obtained in wells installed at FTMM-53 and FTMM-68 to support creation of a combined potentiometric surface map for these sites.

3.2.1.4.6 Up to 15 soil samples will be collected from a maximum of five continuously-sampled borings advanced in the immediate vicinity of the former solvent UST and tank piping run to assess the presence, magnitude, and lateral/vertical extent of any residual or mobile DNAPL present in the subsurface. To the extent possible, these samples will be collected from borings drilled for groundwater sampling purposes (i.e., groundwater grab samples or monitoring wells); however, this will be dependent on these borings being suitably located to achieve the soil sampling objectives stated above. It is anticipated that any soil contamination will be more localized in the vicinity of the former UST than groundwater contamination, which will be more laterally extensive. Initially, two borings will be advanced approximately 5 feet from the eastern and southern edges of the former UST excavation, and one boring will be advanced along the tank piping run. The remaining two borings will be reserved for "step-out" locations to determine the lateral extent of contamination identified at the first three borings based on PID screening results (if necessary). At each boring location, soil samples for laboratory analysis will be collected from 0.5 to 2 feet bgs, just above the water-table, and just above the top of the shallowest aquitard that would inhibit downward migration of contaminants and form the base of the shallow water-bearing zone. However, if PID headspace readings indicate the presence of more contamination in another interval, one of the two deeper (subsurface) soil samples will be collected from the apparent zone of maximum contamination instead. Soil samples will be analyzed for VOCs and volatile organic TICs.

3.2.1.4.7 Review of historical documents has indicated that the hydraulic conductivity of the water-bearing zone(s) beneath FTMM-68 has not been adequately determined via aquifer testing. Therefore, slug tests will be performed in two shallow and two deep monitoring wells using the procedure described in the SAP.

3.2.2 Data Quality Objectives

3.2.2.1 Data Quality Objectives (DQOs) are qualitative and quantitative statements that specify the quality and level of data required to support the decision-making processes for a project. Guidance for DQO development is contained in Section 4 of EM 200-1-2 *Technical Project Planning Process* (USACE, 1998), *Guidance for Performing Site Inspections Under CERCLA* (USEPA, 1992), and *Guidance on the Data Quality Objectives Process* (USEPA, 2006).

3.2.2.2 The overall project DQOs are to obtain data to characterize 1) the nature and extent of contamination present at FTMM-22, FTMM-53, FTMM-59, and FTMM-68; and 2) the hydraulic conductivity of the impacted water-bearing zones as necessary. The data obtained must also be sufficient to assess site-specific human health risks and to facilitate development of a future FS. Specific DQOs have been established for the RI and are presented in **Table 3.3**. In addition, analytical measurement performance criteria have been developed for target analytes as presented in the Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) in Section 7 of the SAP (**Appendix E**).

3.2.3 Data Incorporation into RI/FS Reports

3.2.3.1 Parsons will prepare and submit an RI/FS report for each site that fully documents the field activities and provides subsequent evaluations and recommendations. These reports will describe the site history and the work conducted under this delivery order and present conclusions regarding the nature/extent of contamination at the site, an updated CSM, a risk assessment, recommendations for any future work that might be required, an analysis of remedial alternatives, and a description of the recommended remedial alternative. The RI/FS reports will be supported as necessary with accompanying maps, charts, tables, and appendices to fully describe and document the work performed and conclusions presented.

3.2.3.2 Parsons will prepare and submit an FS report that provides the necessary information to select a final remedy for each of the four investigated sites if the results of the RI do not support 'no further action' decisions. The primary objective of the FS is to ensure that appropriate remedial alternatives are developed and evaluated, and an appropriate remedy recommended. The FS will be conducted in accordance with CERCLA requirements which suggest a formal process including establishing remedial action objectives (RAOs), identifying and screening technologies, and conducting detailed analysis of alternatives using specified criteria. Remedial alternatives will be screened to ensure compliance with CERCLA statutory provisions such as protection of human health and the environment, compliance with applicable or relevant and appropriate requirements (ARARs), cost effectiveness, and a preference for permanence and for treatment that reduces toxicity, mobility, or volume. Alternatives that will most likely be evaluated include: no action (required for comparison purposes), land use controls (restrictions on land use), MNA, and implementation of one or more appropriate active remedial technologies such as soil excavation and/or enhanced bioremediation. Economic analysis information developed to compare restricted use closure to unrestricted use closure will also be evaluated in accordance with FS guidance to enable selection of a cost effective remedial alternative. This will include a complete life-cycle cost analyses for each alternative based on a 30-year present worth.

3.3 GEOSPATIAL INFORMATION, DIGITAL FIELD DATA COLLECTION, AND ELECTRONIC SUBMITTALS

Parsons will perform activities related to gathering and maintaining geospatial information in accordance with the PWS.

3.3.1 Geospatial Information

Geospatial information will be collected and maintained in accordance with PWS and the Data Management Plan (DMP).

3.3.2 Digital Field Data Collection Methodology

Field documentation including photographs is discussed in the SAP (**Appendix E**).

3.3.3 Electronic Submittals

Electronic submittals are discussed in the PMP.

Table 3.3
Data Quality Objective Statements for Remedial Investigation and Feasibility Study
Fort Monmouth, New Jersey

Site ID	INTENDED DATA USE(S)	DATA NEED REQUIREMENTS						APPROPRIATE SAMPLING AND ANALYSIS METHODS	
	Project Objective(s) Satisfied	Data User Perspective(s)	Contaminant or Characteristic of Interest Identified	Media of Interest Identified	Required Sampling Areas or Locations and Depths Identified	Amount of Sampling/ Number of Samples Required	Reference Concentration of Interest or Other Performance Criteria	Sampling Method Identified	Analytical Method Identified
FTMM-22 (Former CW-1 Lime Pit at Building 2700)	Determine current nature, magnitude, and extent of site-related contamination	Risk (RI) and remedy (FS)	VOCs and metals	Subsurface soil	Adjacent to former CW-1 lime pit	Three borings with two to three soil samples collected per boring; up to nine soil samples total	NJDEP RDCSRS and applicable federal criteria	Collection of discrete soil samples using direct push techniques	VOCs and TICs using USEPA method SW8260C
				Groundwater	Shallow water-bearing zone in the source area and deep water-bearing zone crossgradient of the source area	Three existing monitoring wells	NJDEP GWQS and applicable federal criteria (e.g., MCLs)	Collection of groundwater samples from monitoring wells using low-flow (i.e. micropurge®) sampling methodology	VOCs using USEPA method SW8260C
FTMM-53 (Former Gas Station at Building 699)	Determine current nature, magnitude, and extent of site-related contamination	Risk (RI) and remedy (FS)	VOCs and lead	Surface and subsurface soil	1) north of Saltzman Ave 2) at selected locations containing elevated fuel hydrocarbon concentrations in 2001 3) beneath the fuel islands canopy	Two borings north of Saltzman Ave, four borings at locations containing elevated fuel hydrocarbon concentrations in 2001, and three borings beneath the canopy; three soil samples collected per boring.	NJPDEP RDCSRS and applicable federal criteria	Collection of discrete soil samples using direct push techniques or hand auger (if necessary below canopy due to access restrictions)	VOCs and TICs (including 1,2-dibromomethane and 1,2-dichloroethane) using USEPA method SW8260C
				Groundwater	Samples from new monitoring wells to be installed east and south of Building 699 to assess lateral extent of site-related contamination	Two samples from new monitoring wells	NJDEP GWQS and applicable federal criteria (e.g., MCLs)	Collection of groundwater samples from monitoring wells using low-flow (i.e. micropurge®) sampling methodology	VOCs and TICs using USEPA method SW8260C, and total+dissolved lead using USEPA method SW6010C

Table 3.3
Data Quality Objective Statements for Remedial Investigation and Feasibility Study
Fort Monmouth, New Jersey

Site ID	INTENDED DATA USE(S)	DATA NEED REQUIREMENTS						APPROPRIATE SAMPLING AND ANALYSIS METHODS	
	Project Objective(s) Satisfied	Data User Perspective(s)	Contaminant or Characteristic of Interest Identified	Media of Interest Identified	Required Sampling Areas or Locations and Depths Identified	Amount of Sampling/ Number of Samples Required	Reference Concentration of Interest or Other Performance Criteria	Sampling Method Identified	Analytical Method Identified
FTMM-59 (Former Auto Repair Shop at Building 1122)	Determine current nature, magnitude, and extent of site-related contamination	Risk (RI) and remedy (FS)	VOCs, SVOCs, and metals	Surface and subsurface soil	At the locations of the Chemical Storage Shed and Paint Booth/Shed	Four samples from two soil borings	NJDEP RDCSRS and applicable federal criteria	Collection of discrete soil samples using direct push techniques or hand auger	SVOCs and semivolatile TICs using USEPA method SW8270D and lead using USEPA method SW6010C
				Groundwater	Two recently installed wells installed near the Chemical Storage Shed and Paint Booth/Shed	Two samples from existing wells	NJDEP GWQS and applicable federal criteria (e.g., MCLs)	Collection of groundwater samples from monitoring wells using low-flow (i.e. micropurge®) sampling methodology	VOCs and TICs using USEPA method SW8260C, SVOCs and TICs using USEPA method SW8270D, and total metals using USEPA methods SW6010C/7470A
FTMM-68 (Former Dry Cleaners at Building 700)	Determine current nature, magnitude, and extent of site-related contamination	Risk (RI) and remedy (FS)	VOCs	Surface and subsurface soil	At the location of the former solvent UST that was located at or near the southeast corner of Building 700, and associated tank piping run	Up to 15 samples from up to five soil borings located near the former UST and piping run	NJDEP RDCSRS and applicable federal criteria	Collection of discrete soil samples using direct push techniques	VOCs and TICs using USEPA method SW8260C
				Groundwater	Downgradient and crossgradient of the former solvent UST that was located at or near the southeast corner of Building 700 (groundwater grab sampling points and new and existing monitoring wells)	Up to 12 groundwater grab samples collected from the shallow and deep water-bearing zones; samples from an estimated two monitoring wells installed near the south wall of Building 700 prior to FTMM closure but never sampled; and up to four new RI wells to be installed at as yet undetermined locations and depths.	NJDEP GWQS and applicable federal criteria (e.g., MCLs)	Collection of groundwater samples from monitoring wells using low-flow (i.e. micropurge®) sampling methodology and groundwater grab samples collected from a temporary well consisting of a Geoprobe® groundwater sampling device (or equivalent) using a peristaltic pump.	VOCs for rapid turnaround grab samples and VOCs + TICs for monitoring well samples using USEPA method SW8260C

3.4 WASTE MANAGEMENT PLAN

Investigation derived wastes (IDW) generated during the field activities will be managed in accordance with the procedures provided in the SAP (**Appendix E**).

3.5 RISK CHARACTERIZATION AND ANALYSIS

3.5.1 The validated laboratory data will be used to conduct a risk assessment for each of the four RI sites.

3.5.2 Data evaluation will also consist of discussions related to the probable fate and transport of constituents that pose a concern at the site. This discussion in the RI report will include transport pathways, receptors, and exposure pathways.

3.6 MOBILIZATION/DEMOBILIZATION

3.6.1 Preparation

Preparations for mobilization will commence upon approval of this RI/FS work plan. Upon receipt of the approval, the field team will be notified and the requisite copies of the applicable documents assembled. The field team will have already reviewed the available site documentation, the work plan, and any additional data obtained during previous site visits.

3.6.2 Equipment Mobilization

Equipment and materials will be sent to the site via commercial carrier, transported to the site by the field team, or obtained locally. Equipment is limited to sampling supplies, documents, first aid kit, fire extinguisher, GPS, digital camera, etc. Appropriate field vehicles will be rented that will accommodate site personnel and equipment. FTMM access and security requirements are detailed in the PMP.

3.6.3 Right-of-Entry

Access to FTMM will be requested in accordance with the procedures outlined in the SAP (**Appendix E**).

3.6.4 Communications

The field team will remain together throughout field activities. There will be a minimum of one operational mobile phone available for emergency use.

3.6.5 Training and Briefing

Training and briefing will be performed in accordance with the APP provided in **Appendix D**.

SECTION 4
QUALITY CONTROL PLAN

4.1 GENERAL

The purpose of the Quality Control Plan (QCP) is to provide the approach and procedures used to ensure quality throughout the execution of the tasks required by the PWS. The QCP provides organization, responsibilities, policies, and procedures for maintaining the highest possible standards. The QCP applies to work performed by Parsons and its subcontractors. Additional QC information is provided in the QAPP, which is included as Section 7 in the SAP (**Appendix E).**

4.2 CORPORATE POLICY

4.2.1 Parsons recognizes that the USACE is responsible for quality assurance (QA); however, Parsons also has a QA process at the corporate level with the commitment and involvement of its top management. The process provides a permanent and workable system that allows each employee to understand the job performance expected. The Parsons QA and improvement process ensures that every employee is supported by the actions, procedures, tools, and training required to perform their job according to the requirements. By promoting teamwork and by focusing attention on the solutions, the quality of work can be increased and assured throughout the project.

Parsons Corporation Quality Policy

We are committed to providing quality services and products. We will, as a corporation and as individuals, meet the mutually agreed-to requirements the first time and strive for continuous improvement of our work processes.

4.2.2 The Parsons QA Policy is based on the work and concepts of several recognized authorities on quality management in the United States, especially Mr. Philip Crosby, Dr. W.E. Deming, and Dr. J.M. Juran. These three experts each have different methods of addressing and resolving problems. Parsons has taken unique portions of their concepts and tailored them to corporate work processes. As a result, Parsons has placed a greater emphasis on the actual elements pertaining to work processes, project requirements, and lessons learned from past performances. These concepts have been developed into a systematic and practical approach for improving quality.

4.2.3 Generally, the Parsons QA Policy relies on four fundamentals, termed the "absolutes of quality." They answer these questions:

- What is quality? Conformance to Requirements;
- How do we achieve it? Prevention;
- What is our performance standard? Zero Defects; and
- How can we measure quality? Cost of Doing Things Wrong.

4.3 REQUIREMENTS

The Parsons QCP for the RI/FS at FTMM project sites has been written to encourage positive communication throughout the Parsons project team. It is also intended to foster clear communication between Parsons, USACE, and FTMM. Honest and effective communication among the project team requires that parties clearly understand the project requirements. QC reports and documents will be kept on site and accessible for review upon request. Copies of QC reports and documents will be transmitted to the Parsons PM for inclusion in the project file.

4.4 QUALITY CONTROL OBJECTIVES

4.4.1 The QC procedures described in this section will be used for field work performed during the RI. These procedures were designed to manage, control, and document performance of work efforts. This section of the QCP will achieve the following objectives:

- Identify QC procedures and responsibilities for the RI/FS;
- Ensure USACE, FTMM, and Parsons notifications are performed as required by the PWS;
- Document the quality of work efforts via audits and independent staff reviews of deliverables;
- Ensure data integrity through implementation of data management QC procedures;
- Ensure data precision through implementation of field equipment maintenance and use procedures; and
- Outline an inspection system.

4.4.2 Project quality is the responsibility of the entire project team. The team's comprehension of this QCP is of primary importance for quality objectives to be accomplished; thus, training and indoctrination of key personnel in the quality objectives will be conducted. The project organization is headed by the Parsons PM; the single focal point for successful accomplishment of the phases of the project. The Parsons PM is given full authority and responsibility for project execution, and the Parsons PM is supported by direct line managers with functions and responsibilities outlined below.

4.4.3 The Parsons Project Manager (PM) approves the QCP, implements procedures, and has direct responsibility for day-to-day management of the project. The Parsons PM's responsibilities related to QC include, but are not limited to:

- Implementation of applicable Parsons policies and procedures;
- Timely submission of contract deliverables; and
- Analyzing QC failures with the QC Manager and the appropriate QC person and implementing corrective actions.

4.4.4 The Project QC Manager communicates with the PM on project-related QC matters. The Project QC Manager, as a management representative, has the following authorities and responsibilities:

- Ensuring that the QCP has been established, maintained, and implemented;

- Establishing guidelines to assist in the development of program, project, site, and task-specific QC policies and procedures;
- Initiating, recommending, approving, and providing solutions to the quality problems identified in the QCP during system audits;
- Conducting periodic audits/inspections of the project and submitting reports to the Parsons Sector Manager with copies to the PM; and
- Reporting the adequacy, status, and effectiveness of ongoing projects to the Parsons Sector Manager.

4.4.5 The Field Team Leader reports to the Project QC Manager on quality matters, is the key QC person onsite, and has responsibility for overall quality of work performed on site. The responsibilities include, but are not limited to:

- Developing QC procedures to implement the QCP;
- Verifying implementation of corrective actions;
- Initiating actions to identify and prevent the occurrence of nonconformance relating to the services and QCP;
- Authorizing the cessation of nonconforming work;
- Ensuring that QC procedures are being followed and are appropriate in demonstrating data validity sufficient to meet DQOs;
- Recommending actions to be taken in the event of QC failures, both to the PM and the Project QC Manager;
- Reporting non-compliance with QC criteria to the PM and Project QC Manager;
- Authorizing suspension of project activities when a condition adverse to quality is identified and notifying the PM and senior personnel responsible for clearance activities when such action is required;
- Conducting daily QC audits and inspections; and
- Conducting weekly and monthly QC Compliance Inspections.

4.5 QUALITY CONTROL FOR INSTRUMENT AND EQUIPMENT TESTING

Instruments and equipment used to gather and generate environmental data will be calibrated in accordance with the procedures outlined in the SAP (**Appendix E**).

4.5.1 Digital Camera Quality Control

The digital camera will be checked each day prior to use during the project. The battery level will be checked and, as needed, the batteries recharged or replaced as appropriate. Before work begins each morning, team lead will verify that camera functions are working properly, that the date/time setting on the camera is correct, and the available memory space on the camera is sufficient for a complete day of site photography.

4.5.2 Cell Phone Quality Control

The field team will keep at least one cell phone with them for emergency use. The cell phone will be checked each day prior to use during the project. The battery level will be checked

and, as needed, the batteries recharged or replaced. In addition, the team will verify that cell phone coverage is adequate at the site. If at any time during the project it is determined that cell phone communication is not available at any portion of the site, an alternative method of emergency communication will be investigated.

4.5.3 Field Measurement Instrumentation Control

Field measurement instrumentation will be performed in accordance with the procedures outlined in the SAP (**Appendix E**).

4.6 INSTRUMENT/EQUIPMENT MAINTENANCE

Maintenance of instruments and equipment will be performed in accordance with the procedures outlined in the SAP (**Appendix E**).

4.7 DATA MANAGEMENT

4.7.1 Data Reduction

4.7.1.1 Any raw data from field measurements will be appropriately recorded in field notebooks. Records (field data forms and field note copies) will be maintained onsite in a portable file. Records will be stored such that they can be found using the date they were created, the team who created them and a site identification number. If the data are to be used in the project reports, they will be reduced and summarized, and the reduction method will be documented in the report.

4.7.1.2 Reduction of the laboratory data from environmental sampling activities is discussed in the SAP.

4.7.2 Field Data Storage

Data collected in the field will be stored electronically in the collecting instrument's data logger or recorded manually on hardcopy field forms. Data loggers, if used, will be synchronized with the field computer daily. Upon completion of the project, data will be transferred to the Parsons PM's office for storage and archiving.

4.7.3 Data Validation

Information in the project database will be validated in accordance with the DMP. Laboratory data validation is discussed in the SAP.

4.8 FIELD OPERATIONS DOCUMENTATION

4.8.1 Daily Field Activity Records

Daily field activity records will be prepared in accordance with the procedures outlined in the SAP (**Appendix E**).

4.9 NONCONFORMING ITEMS OR ACTIVITIES AND CORRECTIVE ACTIONS

4.9.1 Identification

Circumstances that prevent a work process from conforming to the contract requirements will be promptly identified, documented, investigated, and corrected appropriately. Project personnel have the responsibility, as part of their normal work duties, to promptly identify and report conditions adverse to quality. The status of nonconformance reports (NCR) will be

maintained in a log, and progress of their resolutions will be documented and reviewed monthly to ensure prompt attention to their conclusion.

4.9.2 Resolution, Corrective Action, and Verification

The appropriate level of management is responsible for evaluating the cause of an NCR and will recommend solutions for correcting the deficiency identified. Actions and technical justifications for an action proposed to resolve the corrective action will be reviewed and approved by personnel responsible for the technical aspect of the work. The QC organization will be responsible for verifying implementation of corrective action, monitoring the effectiveness of preventive action, and reporting any findings to the QC Manager.

4.9.3 Material and Item Nonconformance

The QC Manager ensures that:

- Items that do not conform to prescribed technical and/or quality requirements are tagged or otherwise identified, documented, and reported as nonconforming. The documentation will include the following information:
  - Identification of the nonconforming activity, material, or item;
  - Identification of the technical and quality requirement(s) with which the activity, material, or item is not in compliance;
  - Identification of the current status of the activity, material, or item (i.e. whether the item is on hold or whether its use is conditional);
  - Names and dates of the individuals identifying the nonconformance;
  - Identification of the individual(s) or organization(s) responsible for resolution;
  - Indication of the severity of the nonconformance(s); and
  - Indication regarding the continuance or stoppage of work associated with each nonconforming activity, material, or item.
- Nonconforming materials and items are segregated, when possible, from conforming materials and/or items to the extent necessary to preclude their inadvertent use; and
- The status of nonconforming activities, materials, and items and the progress of their resolution are documented and routinely reviewed to ensure prompt attention to conclusion.

4.9.4 Review and Disposition of Nonconformance

The review is conducted by the PM, QC Manager, and Field Team Leader (if applicable) to ensure that:

- The responsibility for review and disposition of nonconformance is defined;
- Nonconforming materials and items are reviewed in accordance with procedures. Nonconformance can be evaluated according to four criteria:
  - Reworked to meet the original requirements;
  - Accepted with or without repair;

- Re-graded for alternative applications; and
- Rejected or scrapped.

- Repaired or reworked materials items are re-inspected; and
- Each document used to identify and correct nonconforming conditions allows for the evaluation and approval of proposed actions by the appropriate authority.

4.9.5 Trend Analysis and Root Cause Analysis

4.9.5.1 The trend analysis of QC audits, subcontractor/supplier surveillance reports, and identified nonconformance (if any) will include the following information:

- Total number of audit findings and observations, surveillance reports, and NCRs for each area of the QCP;
- A summary of the root cause for the nonconformance consolidated for each area of the QCP; and
- Trends that are developing or that have developed.

4.9.5.2 The PM will perform the trend analysis once every year. QC will verify the implementation of any preventive actions resulting from the trend analysis. The QC Manager is responsible for evaluating on a semiannual basis NCRs affecting quality and will recommend solutions, as well as steps for verifying their implementation.

4.9.6 Lessons Learned

Opportunities to share lessons learned with the RI/FS project team include monthly telecoms to discuss issues and concerns, as well as quarterly internal project review meetings. Additionally, Parsons will compile internal lessons learned and provide a forum for dissemination between project team members and distribute to other applicable Parsons project locations.

4.10 AUDITS AND SURVEILLANCES

4.10.1 Audit Planning

4.10.1.1 The QC Manager, or designee(s), will perform audits of the project activities and, as required, audits of subcontractors/suppliers in the manner specified in Parsons' corporate procedure Q-021, Quality System Audits.

4.10.1.2 The lead auditor will prepare the audit plan. The plan will be reviewed and approved by the QC Manager before execution. The audit plan will include the following information:

- Identification of the organization and work areas to be audited;
- Identification of location, times, and dates of duration of the audit;
- Identification of the documents that specify the criteria against which the work will be measured;
- Checklists prepared as a guide during the audit;
- Identification of auditing personnel; and

- Signatures and dates approving the audit.

4.10.1.3 The organization to be audited will be notified of the impending audits at least 15 days in advance.

4.10.2 Audit Execution

A pre-audit briefing and a post-audit briefing will be conducted to inform key management personnel or to confirm results of the audit, including concerns and findings. Daily briefings may be conducted, as needed, to inform the audited organizations of the progress of the audit and potential findings or concerns.

4.10.3 Audit Reporting

4.10.3.1 The audit results approved by the lead auditor will include the following information:

- Reference to audit plan;
- Identification of and justification for any differences that occurred between the audit plan and the actual conduct of the audit;
- Synopsis of the audit results;
- Description of nonconformity (identified as findings and observations); and
- Completed audit checklist and documentation (objective evidence) supporting the discovery of the nonconformity.

4.10.3.2 Conditions determined to be in nonconformance with the contract, procedure, or other specified requirements, are identified as findings. Conditions not in nonconformance when first identified, but could lead to nonconformance if left uncorrected, are identified as observations. Formal responses are required for findings only. Corrective action is required for both findings and observations.

4.10.3.3 For internal audits, the lead auditor will issue the audit report to the Parsons PM, QC Manager, and the responsible Program Manager. For audits of suppliers or subcontractors, the Lead Auditor will issue the report to the Parsons PM and QC Manager, who will issue the audit report to the audited subcontractors and suppliers.

4.10.4 Review, Approval, and Verification of Recommended Action Response

4.10.4.1 The recommended corrective action proposed by the management of the organization audited in response to the nonconformity will be reviewed and approved by the QC Manager. Justification for rejection of the response will be documented by the QC Manager and transmitted to the organization providing the response.

4.10.4.2 Management of the organization being audited will report the implementation of corrective action to close out the audit nonconformity. The lead auditor or the QC Manager will verify a closeout action at the time of the next scheduled audit.

4.10.4.3 Verification of closeout action will be documented to ensure the satisfactory closure of the audit nonconformity and will be reported to the Parsons PM and to the management of the organization audited, when applicable.

4.11 QUALITY CONTROL REPORTS

4.11.1 During the project, the QC Manager, or designee, will prepare at least one QC report to discuss:

- The periodic assessment and measurement of data accuracy, precision, and completeness; and/or
- Significant QA problems and corrective actions taken.

4.11.2 In addition, the Parsons PM will receive periodic updates concerning QC associated with the field activities, laboratory analyses, and the data processing.

4.12 DOCUMENTS AND SUBMITTALS

4.12.1 Process

Documents and submittals prepared for the RI/FS at FTMM will be the result of a collaborative effort by key personnel dedicated to the project. Qualified individuals from each major discipline represented in the deliverable will compose the applicable portion of the document.

4.12.2 Review

Documents and submittals will be reviewed for technical accuracy and editorial merit by qualified peers and/or the appropriate Technical Director(s). The Parsons PM will collect and retain records of these reviews. The QC Manager will audit the project files to ensure that final reports and deliverables have gone through peer review.

4.12.3 Document Distribution and Retrieval

4.12.3.1 The current revisions of documents that prescribe technical, management, and quality requirements are internally and externally distributed to the applicable project personnel. These personnel are responsible for the document's implementation and its verification for implementation.

4.12.3.2 The obsolete documents that prescribe obsolete technical and quality requirements are clearly marked and returned to the Parsons PM upon receipt of any revised document. The recipient must also immediately conduct a page change for affected documents by inserting the revised document or slip pages in place of the obsolete. The Parsons PM will maintain a complete list of revisions and will include a summary of the revisions with the document revision submittals.

4.13 PERSONNEL SELECTION

4.13.1 Key personnel will be designated by the PM. Those requiring licenses, certification, or other forms of qualifications necessary to perform their work will be selected and evaluated periodically or on each change of task assignment by program management to ensure that their credentials are current to perform the pre-established job description, meeting the contract requirements.

4.13.2 Project personnel performing functions that affect quality will receive, prior to assuming duty, indoctrination and training. The job description, indoctrination, training, and certification will be maintained in the project files. To ensure quality and consistency

throughout the duration of the FTMM RI/FS, Parsons will maintain a dedicated group of qualified, trained project personnel to conduct the various tasks associated with this project.

4.14 PERSONNEL QUALIFICATIONS AND TRAINING

Qualifications and training of project personnel will comply with the requirements specified in the PWS and the APP (**Appendix D)**.

4.15 CHEMICAL DATA QUALITY MANAGEMENT PLAN

The QCP procedures for the Chemical Data Quality Management Plan are discussed in the SAP. Parsons-specific QC procedures will be included in the SAP.

SECTION 5
ENVIRONMENTAL PROTECTION PLAN

5.1 INTRODUCTION

This EPP has been prepared for the FTMM RI/FS project field activities in accordance with the PWS. The purpose of the EPP is to establish general procedures for avoiding, minimizing, and mitigating potential impacts to environmental and cultural resources during field activities.

5.2 SENSITIVE RESOURCES

5.2.1 Threatened and Endangered Species

Except for occasional transient species, no federally listed or proposed threatened or endangered flora or fauna are known to exist on FTMM. There was one observance in 1992 of a New Jersey listed endangered species, the clustered sedge. In addition, no federal or state listed species were observed during the baseline ecological evaluation site visit conducted on the MP and CWA on September 15, 2009 (Shaw, 2011). Due to the developed, urbanized nature of the RI/FS sites and the nature of the work to be performed during the RI/FS, no listed threatened and endangered species are anticipated to be encountered or adversely impacted by the RI field effort.

5.2.2 Sensitive Environments

5.2.2.1 Areas of wetlands are present on both the MP and CWA, with both estuarine and fresh water wetlands present on the MP. The USFWS National Wetland Inventory maps have designated wetland areas at the MP and CWA. Areas along Oceanport Creek and Parkers Creek are designated estuarine and marine wetlands or open waters; areas along Mill Creek, Husky Brook, Lafetra and Shrewsbury Creeks are freshwater emergent or forested/shrub wetlands.

5.2.2.2 None of the RI work to be performed at FTMM-22, FTMM-53, FTMM-59, and FTMM-68 will occur in designated wetland areas or other areas considered to be important ecological places. Each RI site is developed and urbanized. However, GIS digital data available through the NJDEP indicate the presence of deciduous wetlands along Mill Creek in the area of Building 1122 (FTMM-59). The NJDEP Landscape Project Critical Wildlife Habitat database indicates that the wetland area is habitat Rank 1, which is assigned to patches that meet suitability requirements for endangered, threatened, or priority wildlife species but do not have confirmed occurrences of such species (Shaw, 2011). The RI field team will be cautioned to avoid any disturbance or impact to this wetland area during performance of RI field activities.

5.2.3 Cultural and Archeological Resources

None of the RI sites contain any registered or otherwise recognized cultural or archaeological resources. Nevertheless, if an archeological remnant is discovered or suspected during the RI effort, activities in that area will be halted. It is Parsons' policy to note in the field log the location of any archaeologically significant item found by the field team, and will notify USACE and FTMM personnel. Photographs of any archaeological or cultural item found may be included in the RI/FS report.

5.2.4 Water Resources

A discussion of water resources at FTMM can be found in Sections 1.5.4 and 1.5.6.

5.2.5 Coastal Zones

None of the RI sites are located within a Coastal Zone Management Area since they are not located on a tidally influenced shoreline. Therefore, the sites are also not within a National Marine Sanctuary, Marine Protected Area, or the National Estuarine Research Reserve System.

5.2.6 Waste Disposal Sites

Based on the history and usage of the RI sites, there are no known munitions storage areas at these locations. No use of chemical warfare materiel has been reported at the sites.

5.3 MITIGATION PROCEDURES

Various measures will be used to mitigate the environmental impacts of RI field activities. The following general measures will be taken during onsite activities:

- Site-specific training will be given on awareness of nearby wetland areas (FTMM-59);
- Areas that have been disturbed as a result of field activities will be restored in accordance with the procedures outlined in the SAP (**Appendix E**);
- No burning activities will take place during this project;
- Emissions sources will consist of any motorized equipment used onsite, including crew vehicles, generators, and drilling rigs. Vehicles and equipment will be in good working order and will meet applicable vehicle emissions requirements; and
- Fueling for small equipment, such as generators, will be performed onsite (via small volume fuel containers). If a leak of fuel or other fluid such as hydraulic or transmission fluid occurs in the field, the procedures outlined in the APP (**Appendix D**).

SECTION 6
PROPERTY MANAGEMENT PLAN

It is not anticipated that government-furnished equipment will not be used during the RI/FS. Therefore, a property management plan will not be required and this section serves as a placeholder only. If government furnished equipment will be used then a property management plan will be prepared.

SECTION 7
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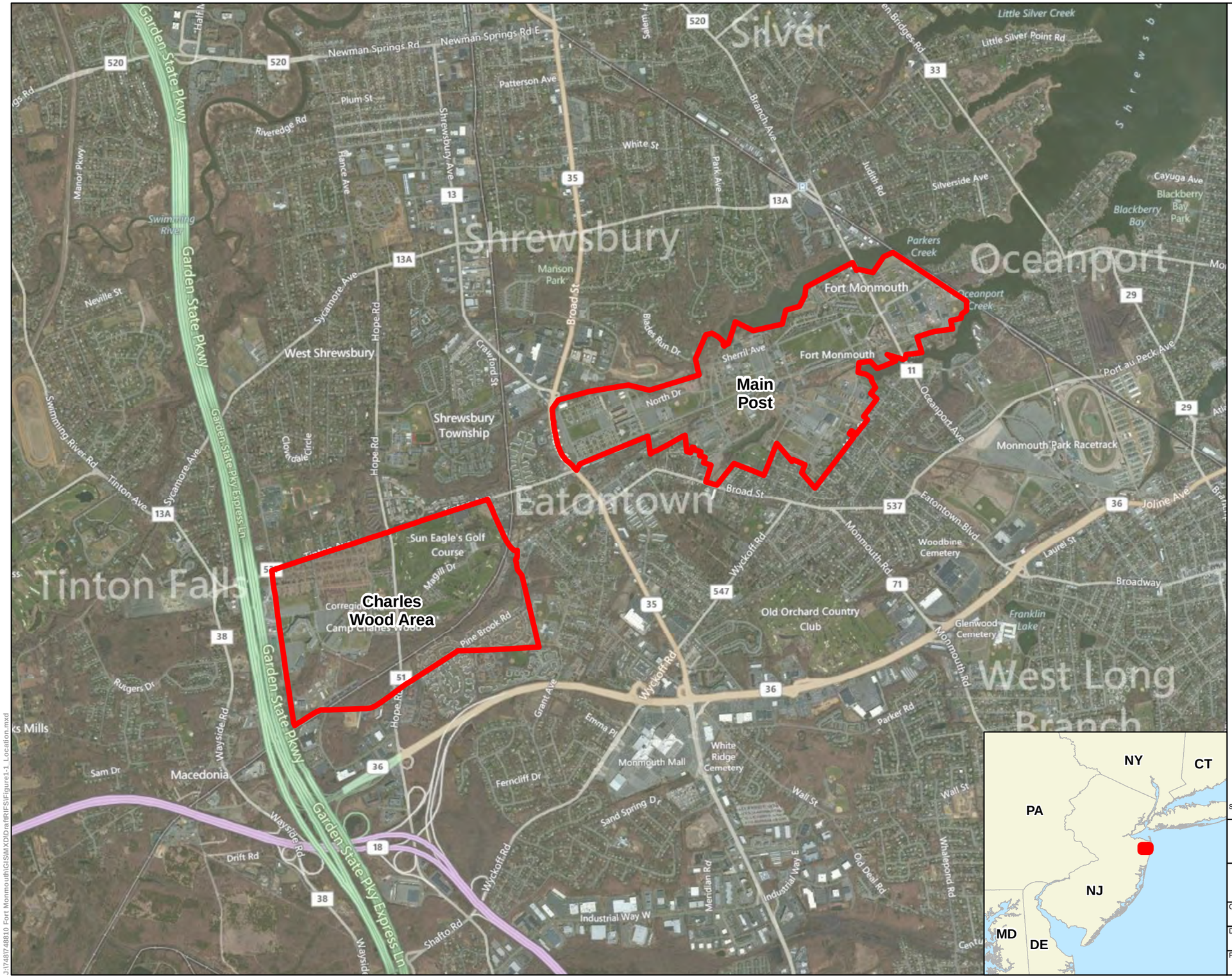
FIGURES



Legend

Installation Boundary

Site Description:
Fort Monmouth
Main Post & Charles Wood Area
Monmouth County, NJ
Longitude: 74˚ 2' 33.39" W
Latitude: 40˚ 18' 49.33" N
Longitude and Latitude represent the center point of Main Post.

N

1 inch = 2,500 feet

0 0.5 1 Miles

Source: Bing Maps online imagery; ESRI Data and Maps 2011.

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

Fort Monmouth Location

CREATED BY: TS	REVIEWED BY: JH
DATE: March 2013	FIGURE NUMBER: Figure 1.1
PROJECT NUMBER: 748810.01000	FILE: Figure1-1_Location.mxd

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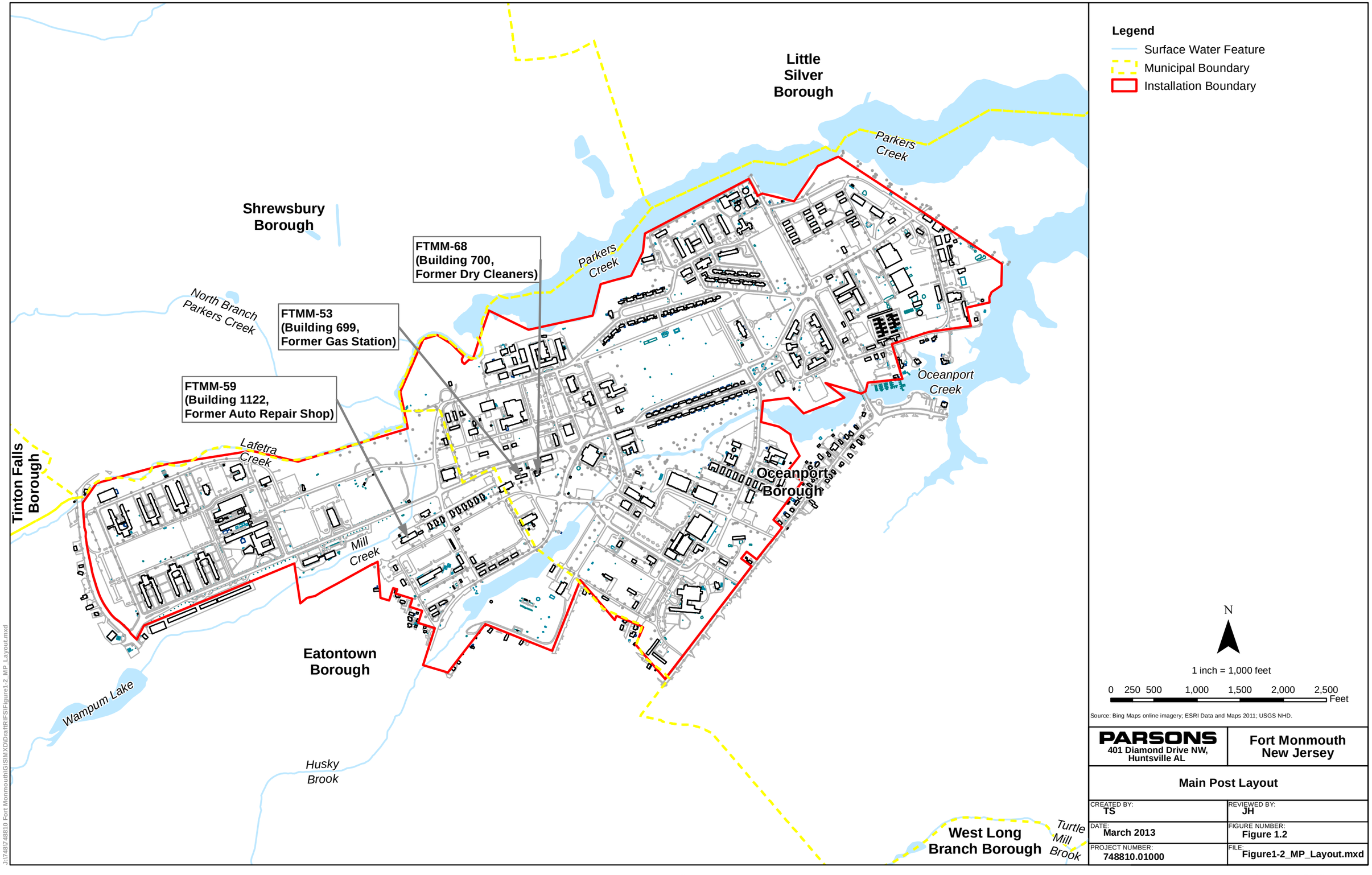
Little Silver Borough
Shrewsbury Borough
Tinton Falls Borough
Eaton town Borough
Oceanport Borough
West Long Branch Borough
Parkers Creek
North Branch Parkers Creek
Lafetra Creek
Mill Creek
Oceanport Creek
Wampum Lake
Husky Brook
Turtle Mill Brook
FTMM-68 (Building 700, Former Dry Cleaners)
FTMM-53 (Building 699, Former Gas Station)
FTMM-59 (Building 1122, Former Auto Repair Shop)
Legend
Surface Water Feature
Municipal Boundary
Installation Boundary
N
1 inch = 1,000 feet
0 250 500 1,000 1,500 2,000 2,500
Feet
Source: Bing Maps online imagery; ESRI Data and Maps 2011; USGS NHD.
PARSONS
401 Diamond Drive NW, Huntsville AL
Fort Monmouth New Jersey
Main Post Layout
CREATED BY: TS
REVIEWED BY: JH
DATE: March 2013
FIGURE NUMBER: Figure 1.2
PROJECT NUMBER: 748810.01000
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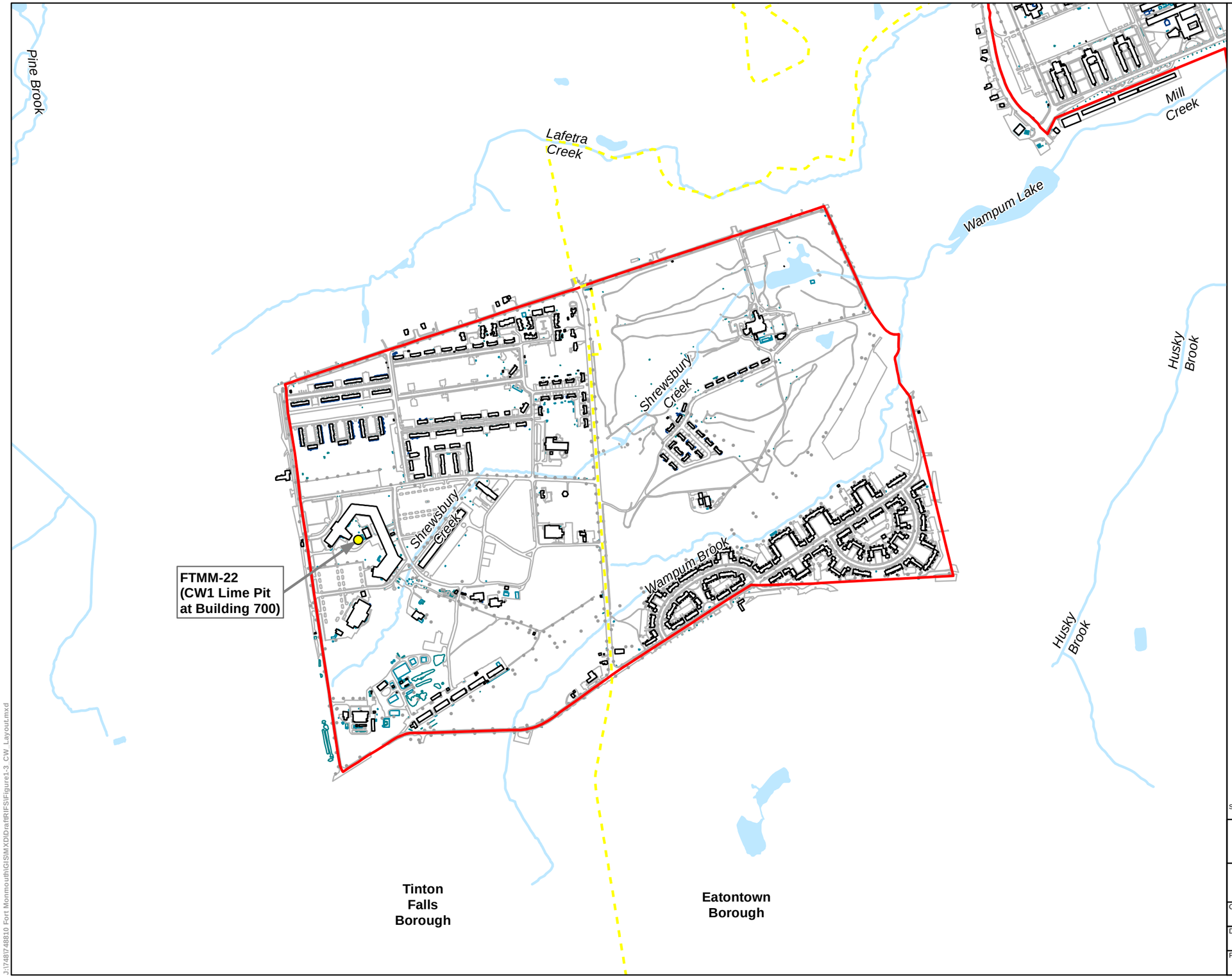


Legend

- Surface Water Feature
- Municipal Boundary
- Installation Boundary

N

1 inch = 1,000 feet

0 250 500 1,000 1,500 2,000 2,500 Feet

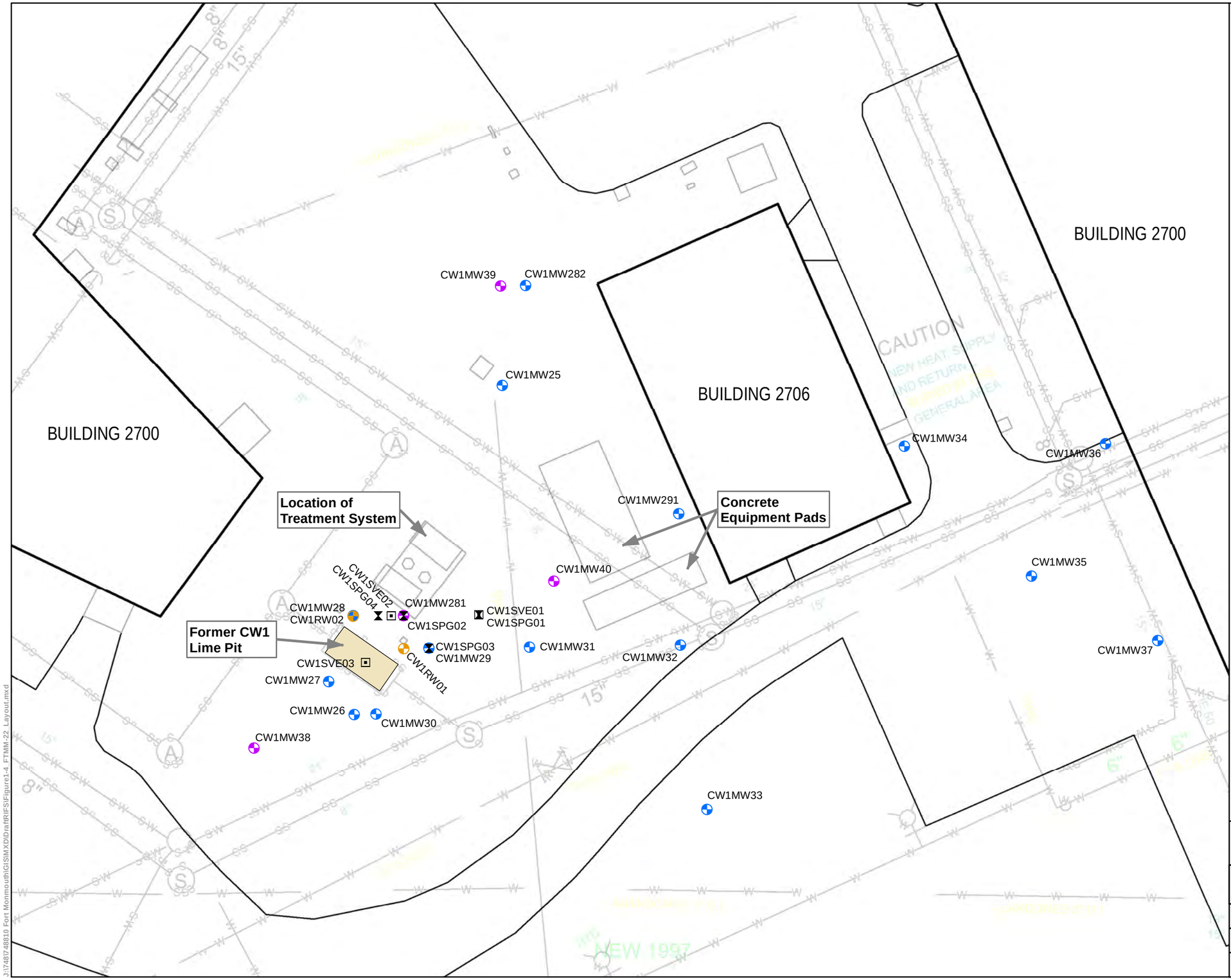
Source: Bing Maps online imagery; ESRI Data and Maps 2011; USGS NHD.

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

Charles Wood Area Layout

CREATED BY: TS	REVIEWED BY: JH
DATE: March 2013	FIGURE NUMBER: Figure 1.3
PROJECT NUMBER: 748810.01000	FILE: Figure1-3_CW_Layout.mxd

J:\748\748810 Fort Monmouth\GIS\MXD\Draft\RIFS\Figure1-3_CW_Layout.mxd



Legend

- Shallow Monitoring Well
- Deep Monitoring well
- Recovery Well
- Air Sparge Well
- SVE
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Former CW1 Lime Pit

N

1 inch = 30 feet

0 12.5 25 50 Feet

Source: FTMM Supplied CAD

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
Layout of FTMM-22 (Former CW1 Lime Pit at Building 2700)	
CREATED BY: TS	REVIEWED BY: JH
DATE: March 2013	FIGURE NUMBER: Figure 1.4
PROJECT NUMBER: 748810.01000	FILE: Figure1-4_FTMM-22_Layout.mxd

J:\748\748810 Fort Monmouth\GIS\MXD\Draft\RIFS\Figure1-4_FTMM-22_Layout.mxd

699MW15
616MW01
699MW02
699SP04
Saltzman Avenue
699SP10
699VP11
699MW05
699MW03
699SP09
699RW05
699RW02
699MW13
699MW04
600MW01
699MW01
699RW01
699VP10
Former Gasoline USTs (Estimated)
699SP05
699SP01
699MW06
699RW03
699SP03
699SP06
699MW14
699SP07
699SP08
699MW08
699RW11
CANOPY
Former Gasoline USTs (Estimated)
Fuel Dispenser Islands
BUILDING 700
(FTMM-68)
699MW07
699RW04
BUILDING 699
(FTMM-53)
699SP02
699MW09
699MW12
699MW16

Legend

- Shallow Monitoring Well
- Vapor Monitoring Well
- Recovery Well
- Air Sparge Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line

N

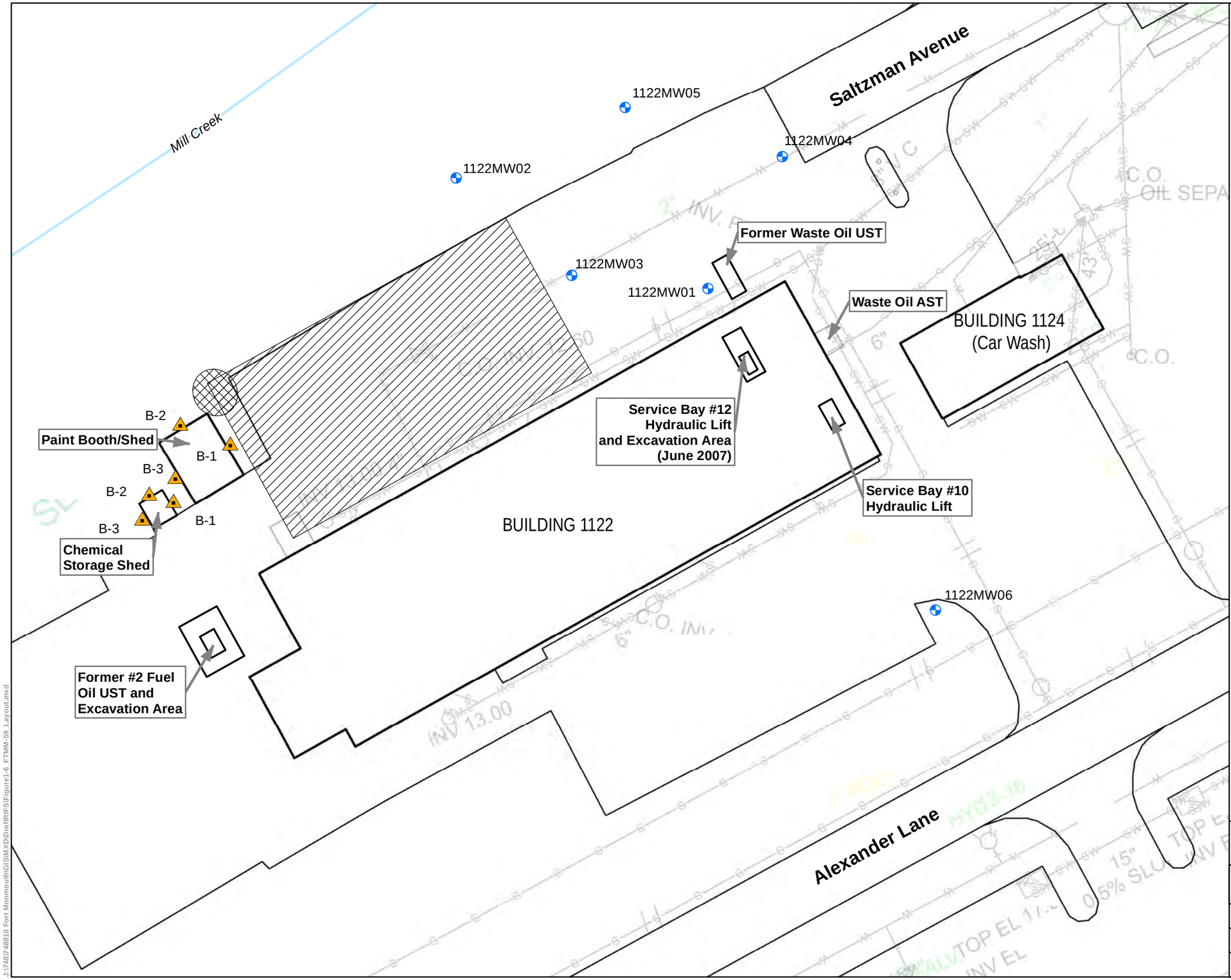
1 inch = 60 feet

0 12.5 25 50 75 100 Feet

Source: FTMM Supplied CAD

J:\748\748810 Fort Monmouth\GIS\MXD\Draft\RIFS\Figure1-5_FTMM-53_Layout.mxd

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
Layout of FTMM-53 (Former Gas Station at Building 699)	
CREATED BY: TS	REVIEWED BY: JH
DATE: March 2013	FIGURE NUMBER: Figure 1.5
PROJECT NUMBER: 748810.01000	FILE: Figure1-5_FTMM-53_Layout.mxd



Legend

- Shallow Monitoring Well
- Previous Soil Sampling Location (May 2010)
- January 2005 Excavation
- April-May 1995 Excavation
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature

Note: Additional historical soil sampling locations are shown on maps provided in Appendix C-4.

N

1 inch = 30 feet

0 12.5 25 50 Feet

Source: FTMM Supplied CAD

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
Layout of FTMM-59 (Former Auto Repair Shop at Building 1122)	
CREATED BY: TS	REVIEWED BY: JH
DATE: March 2013	FIGURE NUMBER: Figure 1.6
PROJECT NUMBER: 748810.01000	FILE: Figure1-6_FTMM-59_Layout.mxd

J:\748\748810 Fort Monmouth\GIS\MXD\Draft\RIFS\Figure1-6_FTMM-59_Layout.mxd

699MW02
699SP04
Saltzman Avenue
699VP11
699SP10
699RW02
699MW13
699MW03
699SP09
699MW05
600MW01
699MW04
699RW05
699VP10
699MW01
699RW01
699SP05
699SP03
699RW03
699MW14
699SP01
699MW06
699MW08
699SP08
699SP06
699RW11
699SP07
BUILDING 700
(FTMM-68)
699MW07
565MW01 (Estimated)
565MW01D (Estimated)
BUILDING 699
(FTMM-53)
699RW04
699SP02
699MW09
Former Solvent
UST Location (Estimated)
699MW12
699MW16
Brewer Avenue
Alexander Avenue
700AMW03

Legend

- Shallow Monitoring Well
- Deep Monitoring well
- Vapor Monitoring Well
- Recovery Well
- Air Sparge Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- UST Excavation Footprint

N

1 inch = 70 feet

0 12.525 50 75 100 125 Feet

Source: FTMM Supplied CAD

J:\748\7748810 Fort Monmouth\GIS\MXD\Draft\RIFS\Figure1-7_FTMM-68_Layout.mxd

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
Layout of FTMM-68 (Former Dry Cleaners at Building 700)	
CREATED BY: TS	REVIEWED BY: JH
DATE: March 2013	FIGURE NUMBER: Figure 1.7
PROJECT NUMBER: 748810.01000	FILE: Figure1-7_FTMM-68_Layout.mxd

Figure 3.1
PRELIMINARY CONCEPTUAL SITE MODEL DIAGRAM FOR FTMM-22

Site Name: Fort Monmouth, New Jersey, FTMM-22 (Former CW-1 Waste Lime Pit)

Completed By: Cindy Conway, Steve Rembish, John Hicks ***Date Completed:*** March 27, 2013

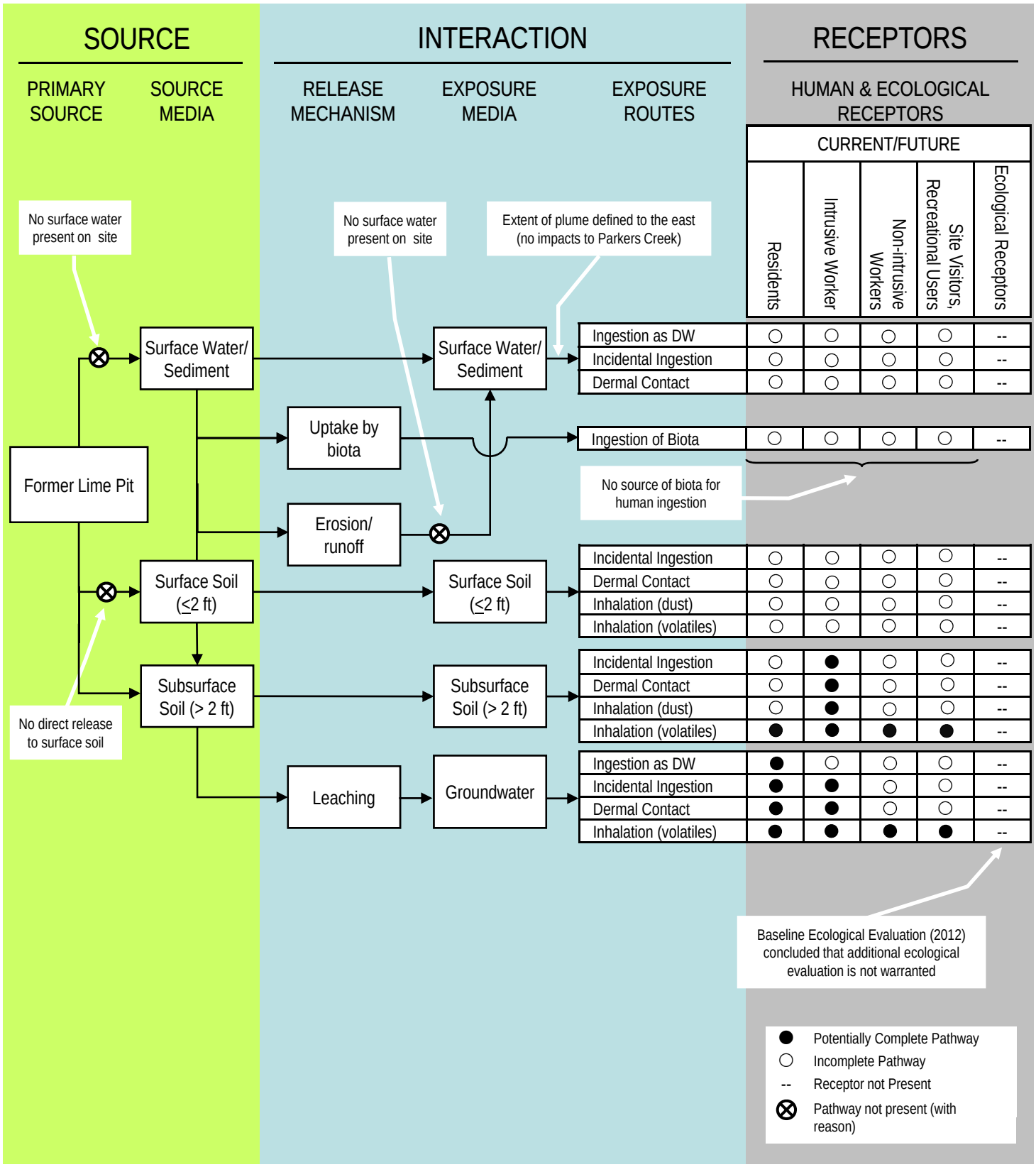


Figure 3.2
PRELIMINARY CONCEPTUAL SITE MODEL DIAGRAM FOR FTMM-53

Site Name: Fort Monmouth, New Jersey, FTMM-53 (Building 699 Service Station)

Completed By: Cindy Conway, Steve Rembish, John Hicks ***Date Completed:*** March 27, 2013

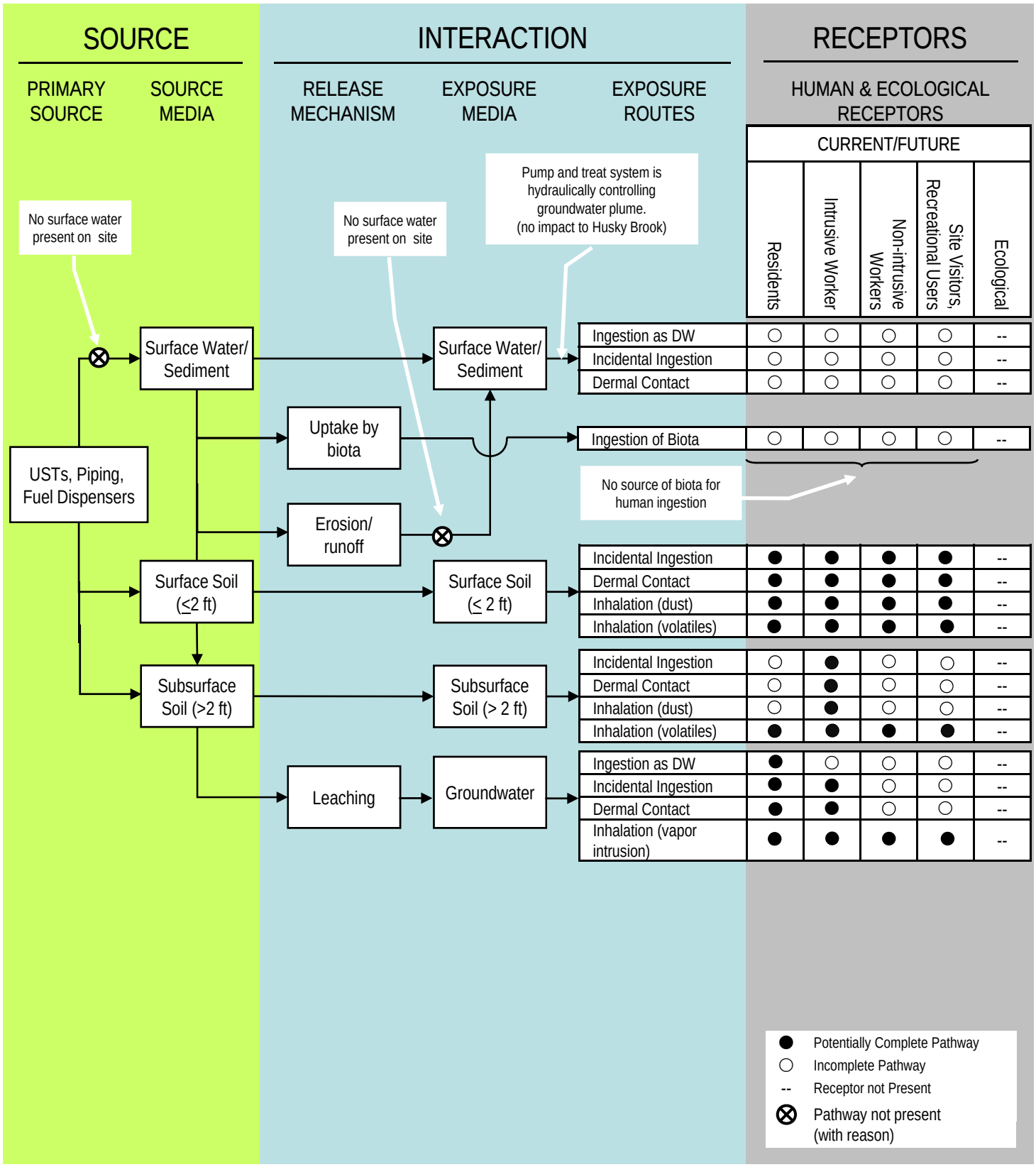


Figure 3.3
PRELIMINARY CONCEPTUAL SITE MODEL DIAGRAM FOR FTMM-59

Site Name: Fort Monmouth, New Jersey, FTMM-59 (Building 1122)

Completed By: Cindy Conway, Steve Rembish, John Hicks ***Date Completed:*** March 27, 2013

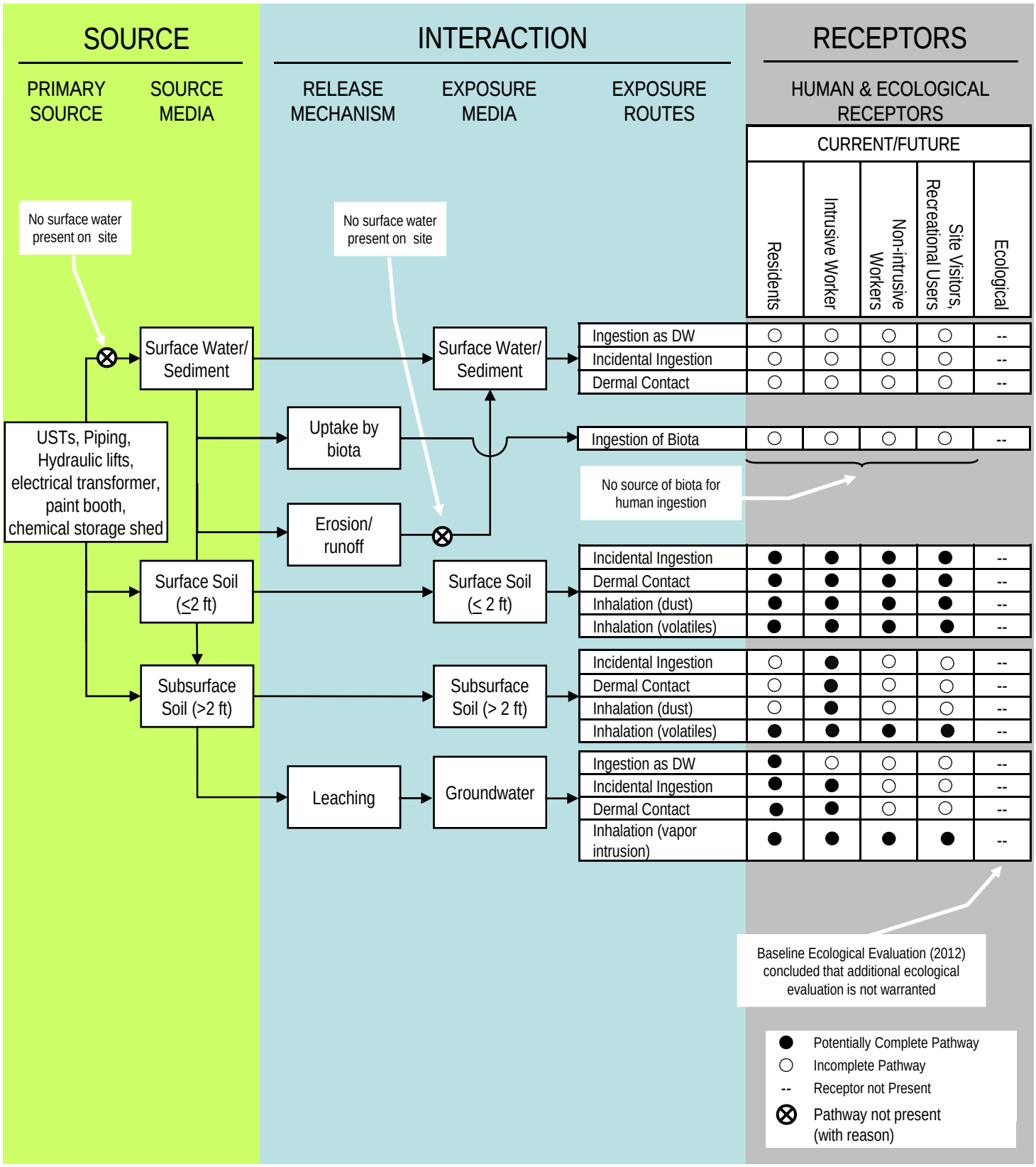
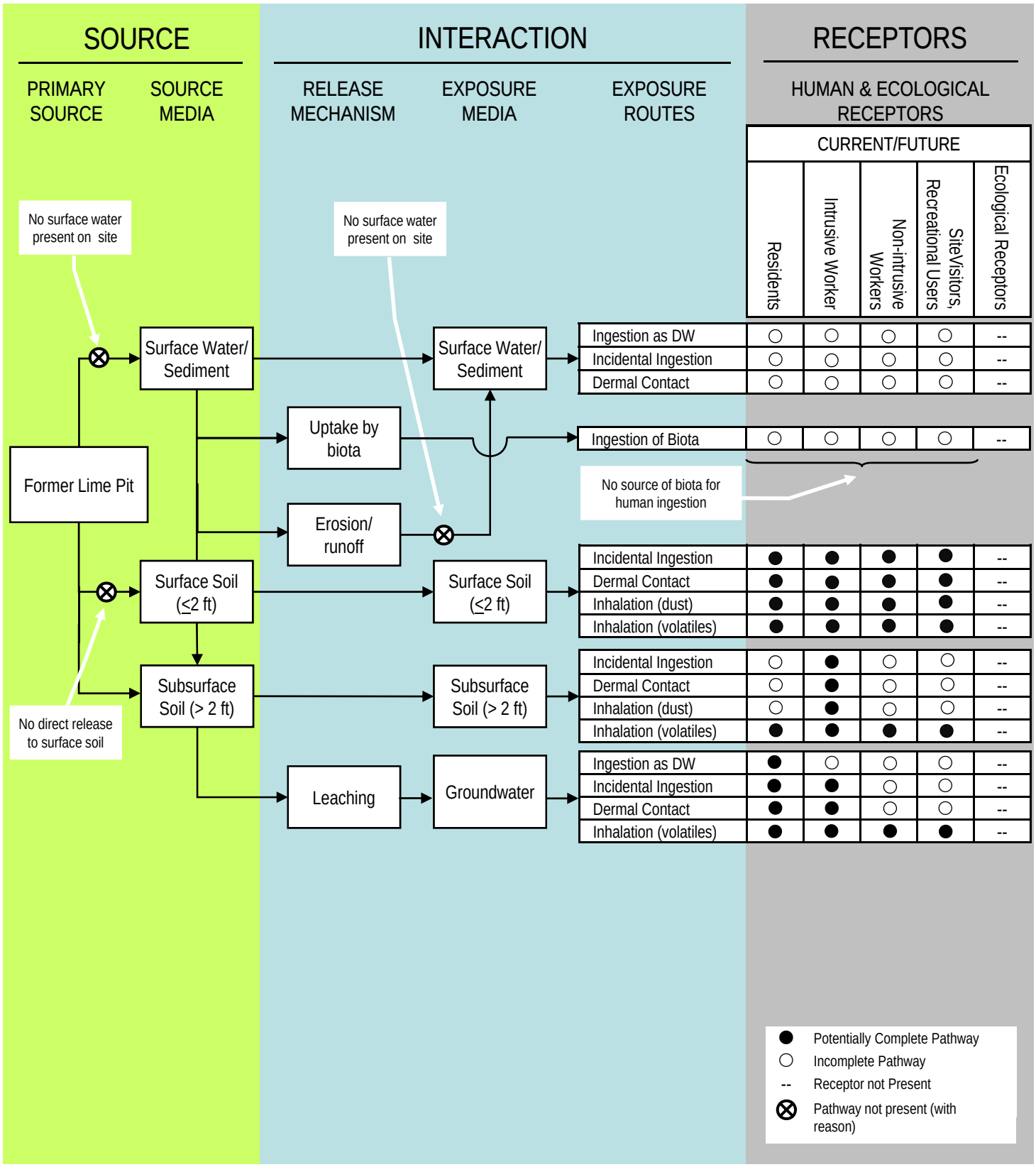
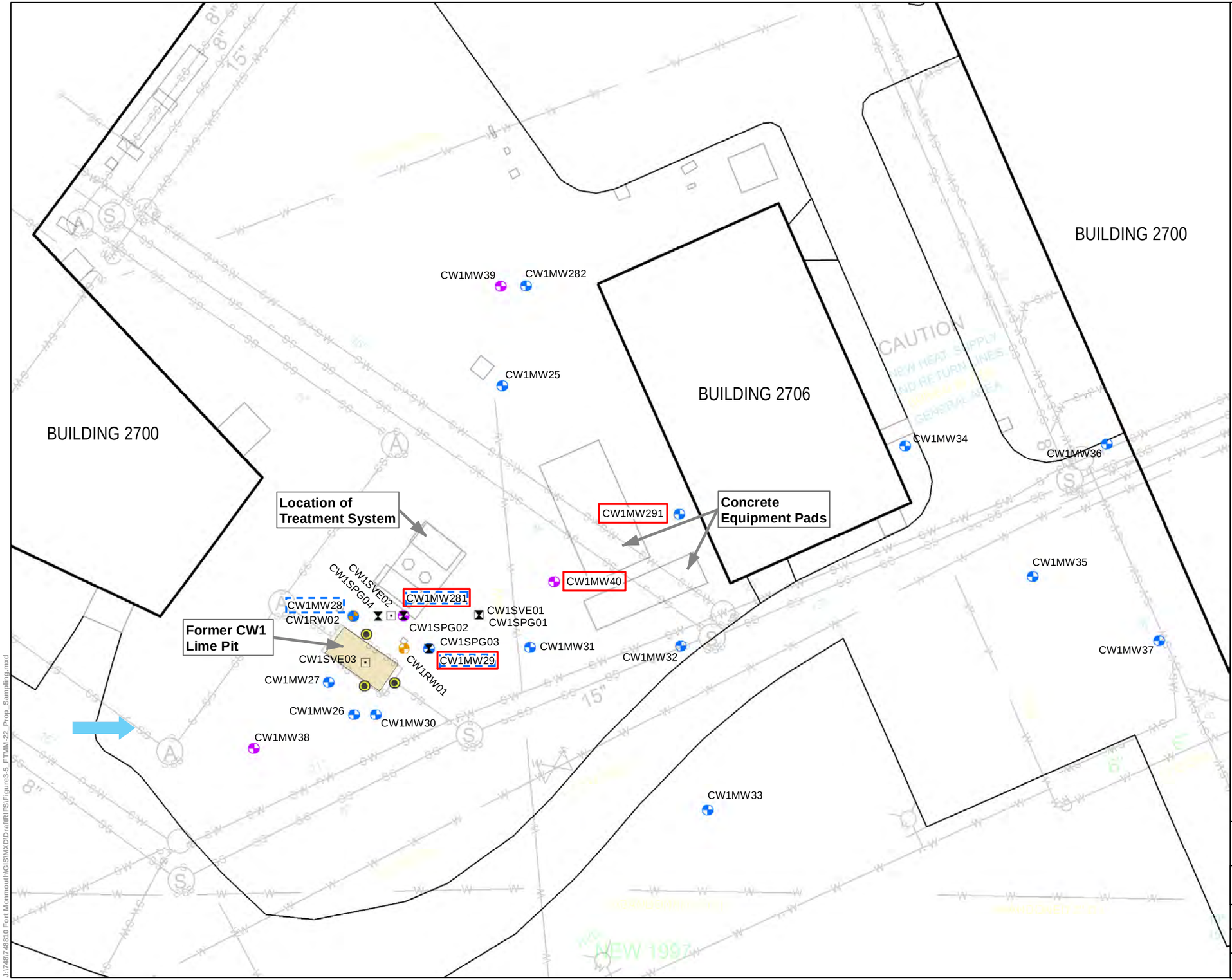


Figure 3.4
PRELIMINARY CONCEPTUAL SITE MODEL DIAGRAM FOR FTMM-68

Site Name: Fort Monmouth, New Jersey, FTMM-68 (Building 700)

Completed By: Cindy Conway, Steve Rembish, John Hicks ***Date Completed:*** March 27,2013





Legend

- Proposed Parsons RI Soil Boring
- CW1MW291 Proposed Parsons RI Slug Test Location
- CW1MW291 Proposed Parsons RI Groundwater Sample
- Shallow Monitoring Well
- Deep Monitoring well
- Recovery Well
- Air Sparge Well
- SVE
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Approximate Groundwater Flow Direction
- Former CW1 Lime Pit

N

1 inch = 30 feet

0 12.5 25 50 Feet

Source: FTMM Supplied CAD

PARSONS 401 Diamond Drive NW, Huntsville AL	**Fort Monmouth New Jersey**
Proposed RI Sampling Locations at FTMM-22	
CREATED BY: TS	REVIEWED BY: JH
DATE: March 2013	FIGURE NUMBER: Figure 3.5
PROJECT NUMBER: 748810.01000	FILE: Figure3-5_FTMM-22_Prop_Sampling.mxd

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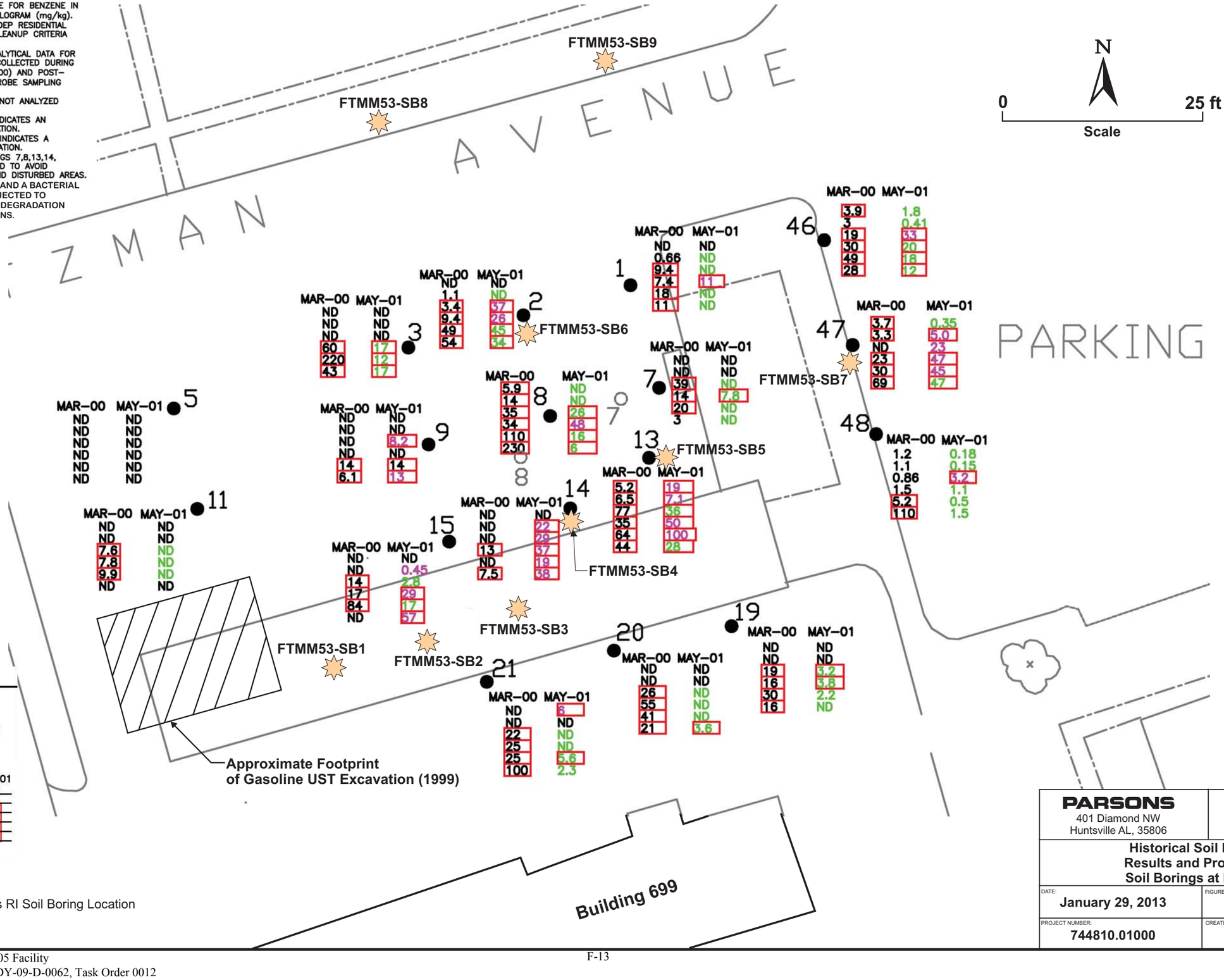
NOTES:
1.) ALL RESULTS SHOWN ARE FOR BENZENE IN UNITS OF MILLIGRAMS/KILOGRAM (mg/kg).
2.) ▭ = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA OF 3 mg/kg.
3.) THIS MAP PRESENTS ANALYTICAL DATA FOR SOIL BORING SAMPLES COLLECTED DURING THE PRE-INJECTION (2000) AND POST-INJECTION (2001) GEOPROBE SAMPLING EVENTS.
4.) ND=NOT DETECTED; NA=NOT ANALYZED NST=NO SAMPLE TAKEN
5.) RESULT IN PINK (37) INDICATES AN INCREASE IN CONCENTRATION.
6.) RESULT IN GREEN (ND) INDICATES A DECREASE IN CONCENTRATION.
7.) THE INJECTION AT BORINGS 7,8,13,14, AND 15 WERE RELOCATED TO AVOID UNDERGROUND PIPES AND DISTURBED AREAS.
8.) ENZYMES, NUTRIENTS, AND A BACTERIAL CONSORTIUM WERE INJECTED TO ENHANCE BIOLOGICAL DEGRADATION OF FUEL HYDROCARBONS.



Source: Versar, 2002

PARSONS 401 Diamond NW Huntsville AL, 35806	Fort Monmouth New Jersey
Historical Soil Benzene Results and Proposed RI Soil Borings at FTMM-53	
DATE: January 29, 2013	FIGURE NUMBER: Figure 3.6
PROJECT NUMBER: 744810.01000	CREATED BY: MA

699MW15
ND
616MW01
ND
699MW02
NS
699SP04
NS
699SP10
NS
699VP11
NS
699MW13
NS
699RW02
NS
699MW04
ND
699MW01
ND
699RW01
NS
699RW05
ND
699SP09
NS
699MW03
NS
699MW05
ND
699VP10
NS
699MW06
ND
699SP01
NS
699MW14
NS
699SP03
NS
699RW03
ND
699SP05
NS
600MW01
NS
699MW08
ND
699SP08
NS
699SP07
NS
699SP06
NS
699RW11
PCE 13.5
TCE 2.8
CANOPY
699MW07
NS
BUILDING 699
(FTMM-53)
699RW04
NS
699SP02
NS
699MW12
ND
FTMM53-MW01
699MW09
PCE 2.3
FTMM53-MW02*
699MW16
PCE 1.7
BUILDING 700
(FTMM-68)
Saltzman Avenue
Former Gasoline USTs (Estimated)
Former Gasoline USTs (Estimated)
Fuel Dispenser Islands

Legend

- Chlorinated Solvents Detected in Groundwater in 2010 and Maximum Detected Concentrations (micrograms per liter)
- ND — Chlorinated Solvents Not Detected in Groundwater in 2010
- NS — Not Sampled in 2010
- Proposed Parsons RI Monitoring Well
- 699RW11 — Proposed Parsons RI Slug Test Location
- Shallow Monitoring Well
- Deep Monitoring well
- Vapor Monitoring Well
- Recovery Well
- Air Sparge Well
- W — Water Line
- S — Sanitary Sewer Line
- SW — Storm Sewer Line
- G — Gas Line
- Approximate Groundwater Flow Direction

* Location of FTMM53-MW02 will be finalized after the extent of the chlorinated solvent plume at FTMM-68 (Building 700) has been characterized.

N

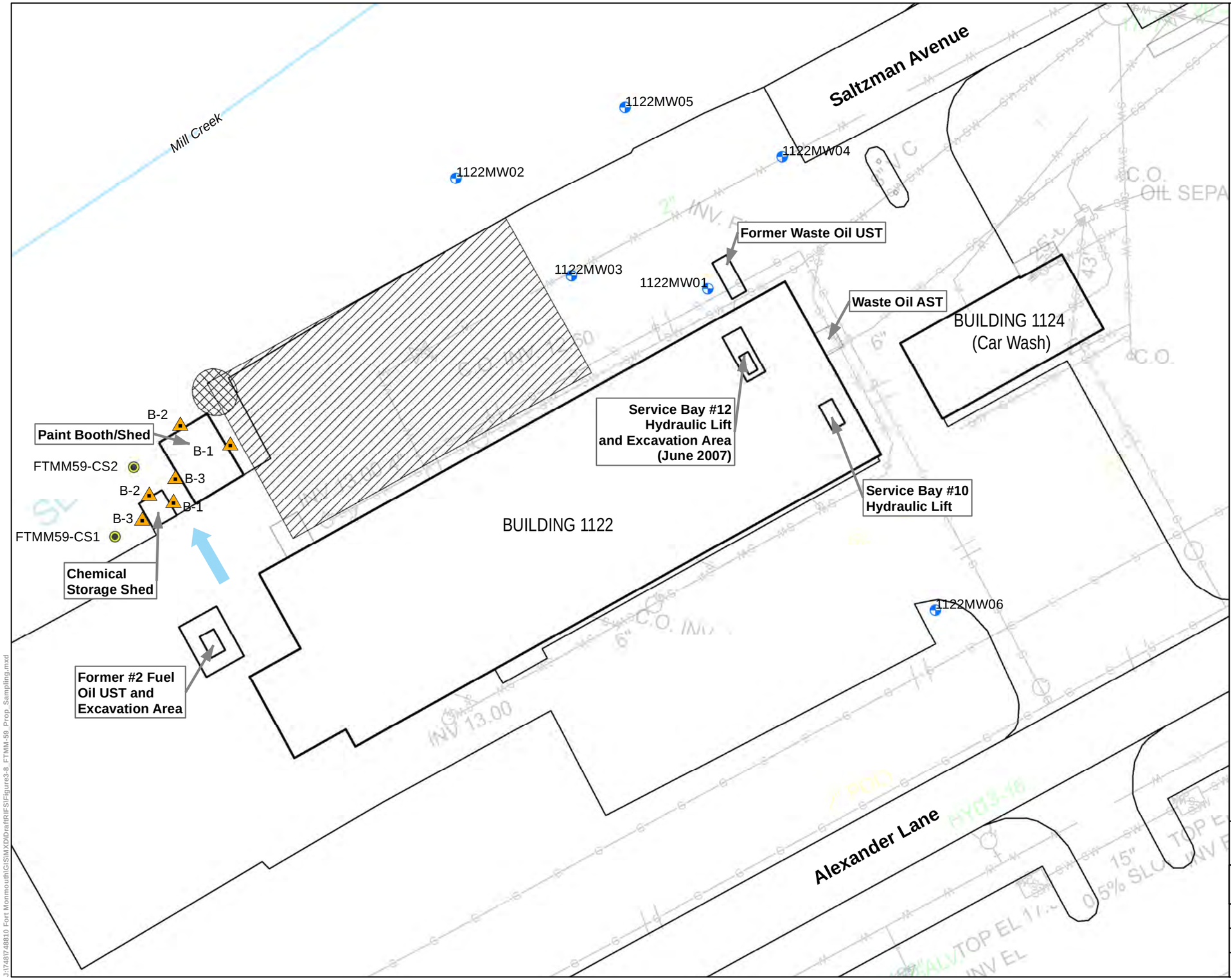
1 inch = 60 feet

0 12.5 25 50 75 100 Feet

Source: FTMM Supplied CAD

J:\748\748810 Fort Monmouth\GIS\MXD\Draft\RIFS\Figure3-7_FTMM-53_Prop_MW_Locations.mxd

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
Proposed RI Monitoring Well and Slug Test Locations at FTMM-53	
CREATED BY: TS	REVIEWED BY: JH
DATE: March 2013	FIGURE NUMBER: Figure 3.7
PROJECT NUMBER: 748810.01000	FILE: Figure3-7_FTMM-53_Prop_MW_Locations.mxd



Legend

- Shallow Monitoring Well
- Previous Soil Sampling Location (May 2010)
- Proposed Parsons RI Soil Boring
- January 2005 Excavation
- April-May 1995 Excavation
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature
- Estimated Groundwater Flow Direction

Note: Additional historical soil sampling locations are shown on maps provided in Appendix C-4.

N

1 inch = 30 feet

0 12.5 25 50 Feet

Source: FTMM Supplied CAD

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
Proposed RI Soil Borings at FTMM-59	
CREATED BY: TS	REVIEWED BY: JH
DATE: March 2013	FIGURE NUMBER: Figure 3.8
PROJECT NUMBER: 748810.01000	FILE: Figure3-8_FTMM-59_Prop_Sampling.mxd

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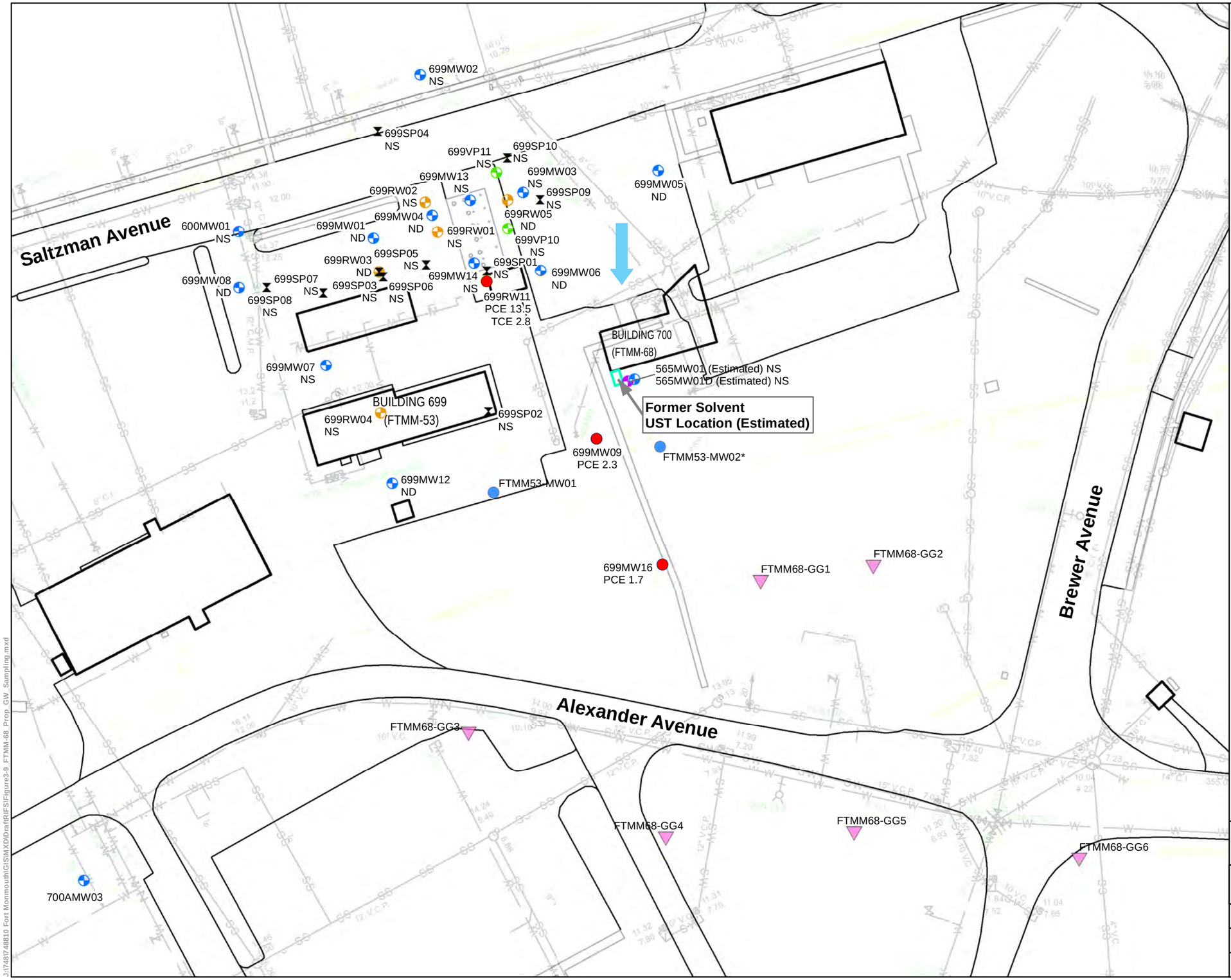

Legend

- Chlorinated Solvents Detected in Groundwater in 2010 and Maximum Detected Concentrations (micrograms per liter)
- ND — Chlorinated Solvents Not Detected in Groundwater in 2010
- NS — Not Sampled in 2010
- Proposed Parsons RI Monitoring Well for FTMM-53
- Proposed Parsons RI Groundwater Grab Sample
- Shallow Monitoring Well
- Deep Monitoring well
- Vapor Monitoring Well
- Recovery Well
- Air Sparge Well
- SVE
- W — Water Line
- S — Sanitary Sewer Line
- SW — Storm Sewer Line
- Approximate Groundwater Flow Direction
- UST Excavation Footprint

* Location of FTMM53-MW02 will be finalized after the extent of the chlorinated solvent plume at FTMM-68 (Building 700) has been characterized.

N

1 inch = 70 feet

0 12.525 50 75 100 125 Feet

Source: FTMM Supplied CAD

PARSONS 401 Diamond Drive NW, Huntsville AL	**Fort Monmouth** **New Jersey**
Proposed Initial Groundwater Grab Sample Locations at FTMM-68	
CREATED BY: **TS**	REVIEWED BY: **JH**
DATE: **March 2013**	FIGURE NUMBER: **Figure 3.9**
PROJECT NUMBER: **748810.01000**	FILE: **Figure3-9_FTMM-68_Prop_GW_Sampling.mxd**

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APPENDICES

APPENDIX A
PERFORMANCE WORK STATEMENT

ORDER FOR SUPPLIES OR SERVICES

PAGE 1 OF 80

1. CONTRACT/PURCH. ORDER/ AGREEMENT NO.	2. DELIVERY ORDER/ CALL NO.	3. DATE OF ORDER/CALL (YYYYMMMDD)	4. REQ./ PURCH. REQUEST NO.	5. PRIORITY
W912DY-09-D-0062	0012	2012 Sep 29	W31RYO22710620	

6. ISSUED BY CODE W912DY
US ARMY ENGINEERING & SUPPORT CENTER
CEHNC-CT
4820 UNIVERSITY SQUARE
HUNTSVILLE AL 35816-1822

7. ADMINISTERED BY *(if other than 6)* CODE
SEE ITEM 6

8. DELIVERY FOB
[X] DESTINATION
[ ] OTHER
(See Schedule if other)

9. CONTRACTOR CODE 1BVK6 FACILITY
NAME AND ADDRESS
PARSONS GOVERNMENT SERVICES INC.
KEN STOCKWELL
100 W WALNUT ST
PASADENA CA 91124-0001

10. DELIVER TO FOB POINT BY (Date) *(YYYYMMMDD)*
SEE SCHEDULE

11. MARK IF BUSINESS IS
[ ] SMALL
[ ] SMALL DISADVANTAGED
[ ] WOMEN-OWNED

12. DISCOUNT TERMS
Net 30 Days

13. MAIL INVOICES TO THE ADDRESS IN BLOCK
See Item 15

14. SHIP TO CODE
SEE SCHEDULE

15. PAYMENT WILL BE MADE BY CODE 964145
US ARMY ENG & SUP CENTER - FINANCE OFFIC
US ARMY CORPS OF ENGRS FINANCE CTR
5722 INTEGRITY DRIVE
MILLINGTON TN 38054-5005

MARK ALL PACKAGES AND PAPERS WITH IDENTIFICATION NUMBERS IN BLOCKS 1 AND 2.

16. TYPE OF ORDER
DELIVERY/ CALL [X] This delivery order/call is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.
PURCHASE [ ] Reference your quote dated
Furnish the following on terms specified herein. REF:

ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.

NAME OF CONTRACTOR | SIGNATURE | TYPED NAME AND TITLE | DATE SIGNED *(YYYYMMMDD)*

[ ] If this box is marked, supplier must sign Acceptance and return the following number of copies:

17. ACCOUNTING AND APPROPRIATION DATA/ LOCAL USE
See Schedule

18. ITEM NO.	19. SCHEDULE OF SUPPLIES/ SERVICES	20. QUANTITY ORDERED/ ACCEPTED*	21. UNIT	22. UNIT PRICE	23. AMOUNT
	SEE SCHEDULE				

** If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and encircle.*

24. UNITED STATES OF AMERICA
TEL:
EMAIL:
BY: CONTRACTING / ORDERING OFFICER

25. TOTAL $2,397,140.94
26. DIFFERENCES

27a. QUANTITY IN COLUMN 20 HAS BEEN
[ ] INSPECTED [ ] RECEIVED [ ] ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED

b. SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE | c. DATE *(YYYYMMMDD)* | d. PRINTED NAME AND TITLE OF AUTHORIZED GOVERNMENT REPRESENTATIVE

e. MAILING ADDRESS OF AUTHORIZED GOVERNMENT REPRESENTATIVE

f. TELEPHONE NUMBER | g. E-MAIL ADDRESS

28. SHIP NO. | 29. DO VOUCHER NO. | 30. INITIALS

[ ] PARTIAL [ ] FINAL

31. PAYMENT
[ ] COMPLETE [ ] PARTIAL [ ] FINAL

32. PAID BY

33. AMOUNT VERIFIED CORRECT FOR

34. CHECK NUMBER

35. BILL OF LADING NO.

36. I certify this account is correct and proper for payment.
a. DATE *(YYYYMMMDD)* | b. SIGNATURE AND TITLE OF CERTIFYING OFFICER

37. RECEIVED AT	38. RECEIVED BY	39. DATE RECEIVED	40. TOTAL	41. S/R ACCOUNT NO.	42. S/R VOUCHER NO.

Section A - Solicitation/Contract Form

AWARD NARRATIVE

Task Order 0012, which contains Firm Fixed-Price (FFP), Fixed Unit Price (FUP), and Cost Plus Fixed Fee (CPFF) Tasks, is being issued to Parsons Government Services, Inc. for the Remedial Investigation / Feasibility Study / Decision Documents, Fort Monmouth, Oceanport, Monmouth County, New Jersey in accordance with the Performance Work Statement entitled "Remedial Investigation / Feasibility Study / Decision Documents, Fort Monmouth, Oceanport, Monmouth County, New Jersey, Project No. 36985" dated August 30, 2012.

The Period of Performance for this Task Order is from date of award to September 30, 2017.

The terms and Conditions of the basic contract, W912DY-09-D-0062 takes precedence in the case of any ambiguity or conflict.

US Department of Labor Wage Determination Number 2005-2251, Revision 11 dated June 19, 2011 shall be used with this project task order.

The following Task Listing reflects funding allocation as accepted from Parsons Government Services:

Task	Description	Type	QTY	Unit	Price	Total Price
1	Kick Off Meeting, PMP, QASP	FFP	1	LS	$18,707.31	$18,707.31
	Additional Meetings	FUP	2	EA	$8,425.28	$16,850.56
2	RI/FS Work Plans (5), UFP-QAPP and QASP	FFP	1	LS	$83,553.40	$83,553.40
3	Performance of Landfill Feasibility Studies and Preparation of RI/FS Reports					
3.1	Feasibility Study of Landfills				$149,024.98	
3.1.1	FS M2 Landfill	FFP	1	LS	$16,558.33	$16,558.33
3.1.2	FS M3 Landfill	FFP	1	LS	$16,558.33	$16,558.33
3.1.3	FS M4 Landfill	FFP	1	LS	$16,558.33	$16,558.33
3.1.4	FS M5 Landfill	FFP	1	LS	$16,558.33	$16,558.33
3.1.5	FS M8 Landfill	FFP	1	LS	$16,558.33	$16,558.33
3.1.6	FS M12 Landfill	FFP	1	LS	$16,558.33	$16,558.33
3.1.7	FS M14 Landfill	FFP	1	LS	$16,558.33	$16,558.33
3.1.8	FS M18 Landfill	FFP	1	LS	$16,558.33	$16,558.33
3.1.9	FS M25 Landfill	FFP	1	LS	$16,558.33	$16,558.33
3.2	RI/FS Reports for Landfills				$93,788.45	
3.2.1	RI/FS M2 Landfill	FFP	1	LS	$10,420.94	$10,420.94
3.2.2	RI/FS M3 Landfill	FFP	1	LS	$10,420.94	$10,420.94
3.2.3	RI/FS M4 Landfill	FFP	1	LS	$10,420.94	$10,420.94
3.2.4	RI/FS M5 Landfill	FFP	1	LS	$10,420.94	$10,420.94
3.2.5	RI/FS M8 Landfill	FFP	1	LS	$10,420.94	$10,420.94
3.2.6	RI/FS M12 Landfill	FFP	1	LS	$10,420.94	$10,420.94

3.2.7	RI/FS M14 Landfill	FFP	1	LS	$10,420.94	$10,420.94
3.2.8	RI/FS M18 Landfill	FFP	1	LS	$10,420.94	$10,420.94
3.2.9	RI/FS M25 Landfill	FFP	1	LS	$10,420.94	$10,420.94
3.3	Proposed Plan for Landfills				$85,132.48	
3.3.1	Proposed Plan for M2 Landfill	FFP	1	LS	$9,459.16	$9,459.16
3.3.2	Proposed Plan for M3 Landfill	FFP	1	LS	$9,459.16	$9,459.16
3.3.3	Proposed Plan for M4 Landfill	FFP	1	LS	$9,459.16	$9,459.16
3.3.4	Proposed Plan for M5 Landfill	FFP	1	LS	$9,459.16	$9,459.16
3.3.5	Proposed Plan for M8 Landfill	FFP	1	LS	$9,459.16	$9,459.16
3.3.6	Proposed Plan for M12 Landfill	FFP	1	LS	$9,459.16	$9,459.16
3.3.7	Proposed Plan for M14 Landfill	FFP	1	LS	$9,459.16	$9,459.16
3.3.8	Proposed Plan for M18 Landfill	FFP	1	LS	$9,459.16	$9,459.16
3.3.9	Proposed Plan for M25 Landfill	FFP	1	LS	$9,459.16	$9,459.16
3.4	Decision Documents for Landfills				$83,243.63	
3.4.1	Decision Document for M2 Landfill	FFP	1	LS	$9,249.29	$9,249.29
3.4.2	Decision Document for M3 Landfill	FFP	1	LS	$9,249.29	$9,249.29
3.4.3	Decision Document for M4 Landfill	FFP	1	LS	$9,249.29	$9,249.29
3.4.4	Decision Document for M5 Landfill	FFP	1	LS	$9,249.29	$9,249.29
3.4.5	Decision Document for M8 Landfill	FFP	1	LS	$9,249.29	$9,249.29
3.4.6	Decision Document for M12 Landfill	FFP	1	LS	$9,249.29	$9,249.29
3.4.7	Decision Document for M14 Landfill	FFP	1	LS	$9,249.29	$9,249.29
3.4.8	Decision Document for M18 Landfill	FFP	1	LS	$9,249.29	$9,249.29
3.4.9	Decision Document for M25 Landfill	FFP	1	LS	$9,249.29	$9,249.29
3.5	Implementation of Presumptive Remedy of Landfills (Optional Task)				$6,883,868.36	
3.5.1	Implement Remedy at M2 Landfill	CPFF	1	LS	$1,131,020.97	$1,131,020.97
3.5.2	Implement Remedy at M3 Landfill	CPFF	1	LS	$1,117,057.75	$1,117,057.75
3.5.3	Implement Remedy at M4 Landfill	CPFF	1	LS	$195,485.11	$195,485.11
3.5.4	Implement Remedy at M5 Landfill	CPFF	1	LS	$446,823.10	$446,823.10
3.5.5	Implement Remedy at M8 Landfill	CPFF	1	LS	$1,005,351.97	$1,005,351.97
3.5.6	Implement Remedy at M12 Landfill	CPFF	1	LS	$991,388.75	$991,388.75
3.5.7	Implement Remedy at M14 Landfill	CPFF	1	LS	$963,462.31	$963,462.31
3.5.8	Implement Remedy at M18 Landfill	CPFF	1	LS	$670,234.65	$670,234.65
3.5.9	Implement Remedy at M25 Landfill	CPFF	1	LS	$363,043.77	$363,043.77
4	RI/FS at Various Sites					
4.1	RI/FS Field Activities at Various Sites				$114,372.01	
4.1.1	RI Activities at FTMM-22	FFP	1	LS	$31,236.00	$31,236.00

4.1.2	RI Activities at FTMM-53	FFP	1	LS	$31,236.00	$31,236.00
4.1.3	RI Activities at FTMM-59	FFP	1	LS	$20,664.01	$20,664.01
4.1.4	RI Activities at FTMM-68	FFP	1	LS	$31,236.00	$31,236.00
4.2	RI/FS Reports at Various Sites				$148,041.01	
4.2.1	RI/FS Report at FTMM-22	FFP	1	LS	$37,010.25	$37,010.25
4.2.2	RI/FS Report at FTMM-53	FFP	1	LS	$37,010.25	$37,010.25
4.2.3	RI/FS Report at FTMM-59	FFP	1	LS	$37,010.25	$37,010.25
4.2.4	RI/FS Report at FTMM-68	FFP	1	LS	$37,010.25	$37,010.25
4.3	PP at Various Sites		1		$41,148.50	
4.3.1	PP at FTMM-22	FFP	1	LS	$10,287.12	$10,287.12
4.3.2	PP at FTMM-53	FFP	1	LS	$10,287.12	$10,287.12
4.3.3	PP at FTMM-59	FFP	1	LS	$10,287.12	$10,287.12
4.3.4	PP at FTMM-68	FFP	1	LS	$10,287.12	$10,287.12
4.4	DD at Various Sites				$40,816.48	
4.4.1	DD at FTMM-22	FFP	1	LS	$10,204.12	$10,204.12
4.4.2	DD at FTMM-53	FFP	1	LS	$10,204.12	$10,204.12
4.4.3	DD at FTMM-59	FFP	1	LS	$10,204.12	$10,204.12
4.4.4	DD at FTMM-68	FFP	1	LS	$10,204.12	$10,204.12
5	RI/FS at Additional Sites with RI Delineation Completed Previously					
5.1	RI/FS Reports at Additional Sites				$172,320.90	
5.1.1	RI/FS Report at FTMM-54	FFP	1	LS	$28,720.15	$28,720.15
5.1.2	RI/FS Report at FTMM-55	FFP	1	LS	$28,720.15	$28,720.15
5.1.3	RI/FS Report at FTMM-56	FFP	1	LS	$28,720.15	$28,720.15
5.1.4	RI/FS Report at FTMM-61	FFP	1	LS	$28,720.15	$28,720.15
5.1.5	RI/FS Report at FTMM-64	FFP	1	LS	$28,720.15	$28,720.15
5.1.6	RI/FS Report at FTMM-66	FFP	1	LS	$28,720.15	$28,720.15
5.2	Proposed Plan at Additional Sites				$62,606.95	
5.2.1	Proposed Plan at FTMM-54	FFP	1	LS	$10,434.49	$10,434.49
5.2.2	Proposed Plan at FTMM-55	FFP	1	LS	$10,434.49	$10,434.49
5.2.3	Proposed Plan at FTMM-56	FFP	1	LS	$10,434.49	$10,434.49
5.2.4	Proposed Plan at FTMM-61	FFP	1	LS	$10,434.49	$10,434.49
5.2.5	Proposed Plan at FTMM-64	FFP	1	LS	$10,434.49	$10,434.49
5.2.6	Proposed Plan at FTMM-66	FFP	1	LS	$10,434.49	$10,434.49
5.3	Decision Documents at Additional Sites				$61,222.16	
5.3.1	Decision Document at FTMM-54	FFP	1	LS	$10,203.69	$10,203.69
5.3.2	Decision Document at FTMM-55	FFP	1	LS	$10,203.69	$10,203.69

5.3.3	Decision Document at FTMM-56	FFP	1	LS	$10,203.69	$10,203.69
5.3.4	Decision Document at FTMM-61	FFP	1	LS	$10,203.69	$10,203.69
5.3.5	Decision Document at FTMM-64	FFP	1	LS	$10,203.69	$10,203.69
5.3.6	Decision Document at FTMM-66	FFP	1	LS	$10,203.69	$10,203.69
5.4	Investigations/Reporting to Augment ECP Phase II SI Report				$63,159.93	
5.4.1	Parcel 28	FFP	1	LS	$7,894.99	$7,894.99
5.4.2	Parcel 38	FFP	1	LS	$7,894.99	$7,894.99
5.4.3	Parcel 39	FFP	1	LS	$7,894.99	$7,894.99
5.4.4	Parcel 49	FFP	1	LS	$7,894.99	$7,894.99
5.4.5	Parcel 57	FFP	1	LS	$7,894.99	$7,894.99
5.4.6	Parcel 61	FFP	1	LS	$7,894.99	$7,894.99
5.4.7	Parcel 69	FFP	1	LS	$7,894.99	$7,894.99
5.4.8	Reporting	FFP	1	LS	$7,894.99	$7,894.99
6	(Optional) Groundwater Sampling and Reporting				$1,151,522.44	
6.1	Groundwater Sampling and Reporting (Annually)	FFP	1	LS	$507,612.39	$507,612.39
6.2	Groundwater Sampling and Reporting (Quarterly)	FFP	1	LS	$527,776.06	$527,776.06
6.3	Groundwater Sampling and Reporting (Two Rounds)	FFP	1	LS	$71,954.81	$71,954.81
6.4	Installation of 10 Groundwater Wells (30 ft bgs)	FFP	1	LS	$44,179.18	$44,179.18
7	UHOT ECP Phase Effort					
7.1	UHOT ECP Phase Addendum Report	FFP	1	LS	$15,330.44	$15,330.44
8	Community Relations Support	FFP	1	LS	$140,998.69	$140,998.69
8.1	(Optional) Community Relations Meeting Support	FUP	1	EA	$14,749.60	$14,749.60
					TOTAL	$9,440,458.17

The following Task Listing reflects funding allocation by site:

	Type	Qty	Unit	Price	Funded
Kick Off Meeting, PMP, QASP	FFP	1	LS	$18,707.31	$18,707.31
Additional Meetings	FUP	2	EA	$8,425.28	
RI/FS Work Plans (5), UFP-QAPP and QASP	FFP	1	LS	$83,553.40	$83,553.40
FTMM M2 Landfill					
Feasibility Study	FFP	1	LS	$16,558.33	$16,558.33
RI/FS Report	FFP	1	LS	$10,420.94	$10,420.94

Proposed Plan	FFP	1	LS	$9,459.16	$9,459.16
Decision Document	FFP	1	LS	$9,249.29	$9,249.29
(Optional) Implement Remedy	CPFF	1	LS	$1,131,020.97	
FTMM M3 Landfill					
Feasibility Study	FFP	1	LS	$16,558.33	$16,558.33
RI/FS Report	FFP	1	LS	$10,420.94	$10,420.94
Proposed Plan	FFP	1	LS	$9,459.16	$9,459.16
Decision Document	FFP	1	LS	$9,249.29	$9,249.29
(Optional) Implement Remedy	CPFF	1	LS	$1,117,057.75	
FTMM M4 Landfill					
Feasibility Study	FFP	1	LS	$16,558.33	$16,558.33
RI/FS Report	FFP	1	LS	$10,420.94	$10,420.94
Proposed Plan	FFP	1	LS	$9,459.16	$9,459.16
Decision Document	FFP	1	LS	$9,249.29	$9,249.29
(Optional) Implement Remedy	CPFF	1	LS	$195,485.11	
FTMM M5 Landfill					
Feasibility Study	FFP	1	LS	$16,558.33	$16,558.33
RI/FS Report	FFP	1	LS	$10,420.94	$10,420.94
Proposed Plan	FFP	1	LS	$9,459.16	$9,459.16
Decision Document	FFP	1	LS	$9,249.29	$9,249.29
(Optional) Implement Remedy	CPFF	1	LS	$446,823.10	
FTMM M8 Landfill					
Feasibility Study	FFP	1	LS	$16,558.33	$16,558.33
RI/FS Report	FFP	1	LS	$10,420.94	$10,420.94
Proposed Plan	FFP	1	LS	$9,459.16	$9,459.16
Decision Document	FFP	1	LS	$9,249.29	$9,249.29
(Optional) Implement Remedy	CPFF	1	LS	$1,005,351.97	
FTMM M12 Landfill					
Feasibility Study	FFP	1	LS	$16,558.33	$16,558.33
RI/FS Report	FFP	1	LS	$10,420.94	$10,420.94
Proposed Plan	FFP	1	LS	$9,459.16	$9,459.16
Decision Document	FFP	1	LS	$9,249.29	$9,249.29
(Optional) Implement Remedy	CPFF	1	LS	$991,388.75	
FTMM M14 Landfill					
Feasibility Study	FFP	1	LS	$16,558.33	$16,558.33
RI/FS Report	FFP	1	LS	$10,420.94	$10,420.94
Proposed Plan	FFP	1	LS	$9,459.16	$9,459.16
Decision Document	FFP	1	LS	$9,249.29	$9,249.29

(Optional) Implement Remedy	CPFF	1	LS	$963,462.31	
FTMM M18 Landfill					
Feasibility Study	FFP	1	LS	$16,558.33	$16,558.33
RI/FS Report	FFP	1	LS	$10,420.94	$10,420.94
Proposed Plan	FFP	1	LS	$9,459.16	$9,459.16
Decision Document	FFP	1	LS	$9,249.29	$9,249.29
(Optional) Implement Remedy	CPFF	1	LS	$670,234.65	
FTMM M22 Landfill					
RI Activities	FFP	1	LS	$31,236.00	$31,236.00
RI/FS Report	FFP	1	LS	$37,010.25	$37,010.25
Proposed Plan	FFP	1	LS	$10,287.12	$10,287.12
Decision Document	FFP	1	LS	$10,204.12	$10,204.12
FTMM M25 Landfill					
Feasibility Study	FFP	1	LS	$16,558.33	$16,558.33
RI/FS Report	FFP	1	LS	$10,420.94	$10,420.94
Proposed Plan	FFP	1	LS	$9,459.16	$9,459.16
Decision Document	FFP	1	LS	$9,249.29	$9,249.29
(Optional) Implement Remedy	CPFF	1	LS	$363,043.77	
FTMM M53 Landfill					
RI Activities	FFP	1	LS	$31,236.00	$31,236.00
RI/FS Report	FFP	1	LS	$37,010.25	$37,010.25
Proposed Plan	FFP	1	LS	$10,287.12	$10,287.12
Decision Document	FFP	1	LS	$10,204.12	$10,204.12
FTMM M54 Landfill					
RI/FS Report	FFP	1	LS	$28,720.15	$28,720.15
Proposed Plan	FFP	1	LS	$10,434.49	$10,434.49
Decision Document	FFP	1	LS	$10,203.69	$10,203.69
FTMM M55 Landfill					
RI/FS Report	FFP	1	LS	$28,720.15	$28,720.15
Proposed Plan	FFP	1	LS	$10,434.49	$10,434.49
Decision Document	FFP	1	LS	$10,203.69	$10,203.69
FTMM M56 Landfill					
RI/FS Report	FFP	1	LS	$28,720.15	$28,720.15
Proposed Plan	FFP	1	LS	$10,434.49	$10,434.49
Decision Document	FFP	1	LS	$10,203.69	$10,203.69
FTMM M59 Landfill					
RI Activities	FFP	1	LS	$20,664.01	$20,664.01
RI/FS Report	FFP	1	LS	$37,010.25	$37,010.25

Proposed Plan	FFP	1	LS	$10,287.12	$10,287.12
Decision Document	FFP	1	LS	$10,204.12	$10,204.12
FTMM M61 Landfill					
RI/FS Report	FFP	1	LS	$28,720.15	$28,720.15
Proposed Plan	FFP	1	LS	$10,434.49	$10,434.49
Decision Document	FFP	1	LS	$10,203.69	$10,203.69
(Optional) FTMM M64 Landfill					
(Optional) RI/FS Report	FFP	1	LS	$28,720.15	
(Optional) Proposed Plan	FFP	1	LS	$10,434.49	
(Optional) Decision Document	FFP	1	LS	$10,203.69	
FTMM M66 Landfill					
RI/FS Report	FFP	1	LS	$28,720.15	$28,720.15
Proposed Plan	FFP	1	LS	$10,434.49	$10,434.49
Decision Document	FFP	1	LS	$10,203.69	$10,203.69
FTMM M68 Landfill					
RI Activities	FFP	1	LS	$31,236.00	$31,236.00
RI/FS Report	FFP	1	LS	$37,010.25	$37,010.25
Proposed Plan	FFP	1	LS	$10,287.12	$10,287.12
Decision Document	FFP	1	LS	$10,204.12	$10,204.12
Investigations/Reporting to Augment ECP Phase II SI Report					
(Optional) Parcel 28	FFP	1	LS	$7,894.99	
(Optional) Parcel 38	FFP	1	LS	$7,894.99	
(Optional) Parcel 39	FFP	1	LS	$7,894.99	
(Optional) Parcel 49	FFP	1	LS	$7,894.99	
(Optional) Parcel 57	FFP	1	LS	$7,894.99	
(Optional) Parcel 61	FFP	1	LS	$7,894.99	
(Optional) Parcel 69	FFP	1	LS	$7,894.99	
(Optional) Reporting	FFP	1	LS	$7,894.99	
(Optional) Groundwater Sampling and Reporting					
Groundwater Sampling and Reporting (Annually)	FFP	1	LS	$507,612.39	$507,612.39
Groundwater Sampling and Reporting (Quarterly)	FFP	1	LS	$527,776.06	$527,776.06
Groundwater Sampling and Reporting (Two Rounds)	FFP	1	LS	$71,954.81	$71,954.81
Installation of 10 Groundwater Wells (30 ft bgs)	FFP	1	LS	$44,179.18	$44,179.18
UHOT ECP Phase Effort					
(Optional) UHOT ECP Phase Addendum Report	FFP	1	LS	$15,330.44	

Community Relations Support	FFP	1	LS	$140,998.69	$140,998.69
(Optional) Community Relations Meeting Support	FUP	1	EA	$14,749.60	
				TOTAL	**$2,397,140.94**

All FUPs are optional and can be exercised in increments of one or more at any time during the performance of the task order.

The following Payment Milestone Schedule is acceptable for use on this project Task Order

Task	Milestone/Deliverable	Cost Type	Total
1	Project Management Plan	FFP	$18,707
	Additional Meeting	FUP	$8,425
2	Work Plan for FS for 9 Landfills	FFP	$11,936
	Work Plan for RI/FS Activities	FFP	$11,936
	Work Plan for ECP Sampling	FFP	$11,936
	Work Plan for Groundwater Sampling	FFP	$11,936
	Work Plan for UHOT Investigation/Removal	FFP	$11,936
	UFP-QAPP	FFP	$11,936
	QASP	FFP	$11,936
3	Performance of Landfill Feasibility Studies and Preparation of RI/FS Reports		
3.1	Feasibility Study of Landfills		
	FS M2 Landfill	FFP	$16,558
	FS M3 Landfill	FFP	$16,558
	FS M4 Landfill	FFP	$16,558
	FS M5 Landfill	FFP	$16,558
	FS M8 Landfill	FFP	$16,558
	FS M12 Landfill	FFP	$16,558
	FS M14 Landfill	FFP	$16,558
	FS M18 Landfill	FFP	$16,558
	FS M25 Landfill	FFP	$16,558
3.2	RI/FS Reports for Landfills		
	RI/FS M2 Landfill	FFP	$10,421
	RI/FS M3 Landfill	FFP	$10,421
	RI/FS M4 Landfill	FFP	$10,421
	RI/FS M5 Landfill	FFP	$10,421
	RI/FS M8 Landfill	FFP	$10,421
	RI/FS M12 Landfill	FFP	$10,421
	RI/FS M14 Landfill	FFP	$10,421
	RI/FS M18 Landfill	FFP	$10,421

	RI/FS M25 Landfill	FFP	$10,421
3.3	Proposed Plan for Landfills		
	Proposed Plan for M2 Landfill	FFP	$9,459
	Proposed Plan for M3 Landfill	FFP	$9,459
	Proposed Plan for M4 Landfill	FFP	$9,459
	Proposed Plan for M5 Landfill	FFP	$9,459
	Proposed Plan for M8 Landfill	FFP	$9,459
	Proposed Plan for M12 Landfill	FFP	$9,459
	Proposed Plan for M14 Landfill	FFP	$9,459
	Proposed Plan for M18 Landfill	FFP	$9,459
	Proposed Plan for M25 Landfill	FFP	$9,459
3.4	Decision Documents for Landfills		
	Decision Document for M2 Landfill	FFP	$9,249
	Decision Document for M3 Landfill	FFP	$9,249
	Decision Document for M4 Landfill	FFP	$9,249
	Decision Document for M5 Landfill	FFP	$9,249
	Decision Document for M8 Landfill	FFP	$9,249
	Decision Document for M12 Landfill	FFP	$9,249
	Decision Document for M14 Landfill	FFP	$9,249
	Decision Document for M18 Landfill	FFP	$9,249
	Decision Document for M25 Landfill	FFP	$9,249
3.5	Implementation of Presumptive Remedy of Landfills (Optional Task)		
	Remedial Action Work Plan for M2 Landfill	CPFF	$452,408
	Remedial Action Work Plan for M3 Landfill	CPFF	$446,823
	Remedial Action Work Plan for M4 Landfill	CPFF	$78,194
	Remedial Action Work Plan for M5 Landfill	CPFF	$178,729
	Remedial Action Work Plan for M8 Landfill	CPFF	$402,141
	Remedial Action Work Plan for M12 Landfill	CPFF	$396,555
	Remedial Action Work Plan for M14 Landfill	CPFF	$385,385
	Remedial Action Work Plan for M18 Landfill	CPFF	$268,094
	Remedial Action Work Plan for M25 Landfill	CPFF	$145,218
	Remedial Action Completion Report for M2 Landfill	CPFF	$678,613
	Remedial Action Completion Report for M3 Landfill	CPFF	$670,235
	Remedial Action Completion Report for M4 Landfill	CPFF	$117,291
	Remedial Action Completion Report for M5 Landfill	CPFF	$268,094
	Remedial Action Completion Report for M8 Landfill	CPFF	$603,211

	Remedial Action Completion Report for M12 Landfill	CPFF	$594,833
	Remedial Action Completion Report for M14 Landfill	CPFF	$578,077
	Remedial Action Completion Report for M18 Landfill	CPFF	$402,141
	Remedial Action Completion Report for M25 Landfill	CPFF	$217,826
4	RI/FS at Various Sites		
4.1	RI/FS Field Activities at Various Sites		
	RI Activities at FTMM-22	FFP	$31,236
	RI Activities at FTMM-53	FFP	$31,236
	RI Activities at FTMM-59	FFP	$20,664
	RI Activities at FTMM-68	FFP	$31,236
4.2	RI/FS Reports at Various Sites		
	RI/FS Report at FTMM-22	FFP	$37,010
	RI/FS Report at FTMM-53	FFP	$37,010
	RI/FS Report at FTMM-59	FFP	$37,010
	RI/FS Report at FTMM-68	FFP	$37,010
4.3	PP at Various Sites		
	PP at FTMM-22	FFP	$10,287
	PP at FTMM-53	FFP	$10,287
	PP at FTMM-59	FFP	$10,287
	PP at FTMM-68	FFP	$10,287
4.4	DD at Various Sites		
	DD at FTMM-22	FFP	$10,204
	DD at FTMM-53	FFP	$10,204
	DD at FTMM-59	FFP	$10,204
	DD at FTMM-68	FFP	$10,204
5	RI/FS at Additional Sites with RI Delineation Completed Previously		
5.1	RI/FS Reports at Additional Sites		
5.1.1	RI/FS Report at FTMM-54	FFP	$28,720
5.1.2	RI/FS Report at FTMM-55	FFP	$28,720
5.1.3	RI/FS Report at FTMM-56	FFP	$28,720
5.1.4	RI/FS Report at FTMM-61	FFP	$28,720
5.1.5	RI/FS Report at FTMM-64	FFP	$28,720
5.1.6	RI/FS Report at FTMM-66	FFP	$28,720
5.2	Proposed Plan at Additional Sites		
	Proposed Plan at FTMM-54	FFP	$10,434
	Proposed Plan at FTMM-55	FFP	$10,434
	Proposed Plan at FTMM-56	FFP	$10,434

	Proposed Plan at FTMM-61	FFP	$10,434
	Proposed Plan at FTMM-64	FFP	$10,434
	Proposed Plan at FTMM-66	FFP	$10,434
5.3	Decision Documents at Additional Sites		
	Decision Document at FTMM-54	FFP	$10,204
	Decision Document at FTMM-55	FFP	$10,204
	Decision Document at FTMM-56	FFP	$10,204
	Decision Document at FTMM-61	FFP	$10,204
	Decision Document at FTMM-64	FFP	$10,204
	Decision Document at FTMM-66	FFP	$10,204
5.4	Investigations/Reporting to Augment ECP Phase II SI Report	FFP	$63,160
6	(Optional) Groundwater Sampling and Reporting		
6.1	Groundwater Sampling and Reporting (Annually)		
	2013 Annual Monitoring Reports for each site	FFP	$101,522
	2014 Annual Monitoring Reports for each site	FFP	$101,522
	2015 Annual Monitoring Reports for each site	FFP	$101,522
	2016 Annual Monitoring Reports for each site	FFP	$101,522
	2017 Annual Monitoring Reports for each site	FFP	$101,522
6.2	Groundwater Sampling and Reporting (Quarterly)		
	2013 Q1 Letter Reports for each site	FFP	$26,389
	2013 Q2 Letter Reports for each site	FFP	$26,389
	2013 Q3 Letter Reports for each site	FFP	$26,389
	2013 Annual Monitoring Reports for each site	FFP	$26,389
	2014 Q1 Letter Reports for each site	FFP	$26,389
	2014 Q2 Letter Reports for each site	FFP	$26,389
	2014 Q3 Letter Reports for each site	FFP	$26,389
	2014 Annual Monitoring Reports for each site	FFP	$26,389
	2015 Q1 Letter Reports for each site	FFP	$26,389
	2015 Q2 Letter Reports for each site	FFP	$26,389
	2015 Q3 Letter Reports for each site	FFP	$26,389
	2015 Annual Monitoring Reports for each site	FFP	$26,389

	2016 Q1 Letter Reports for each site	FFP	$26,389
	2016 Q2 Letter Reports for each site	FFP	$26,389
	2016 Q3 Letter Reports for each site	FFP	$26,389
	2016 Annual Monitoring Reports for each site	FFP	$26,389
	2017 Q1 Letter Reports for each site	FFP	$26,389
	2017 Q2 Letter Reports for each site	FFP	$26,389
	2017 Q3 Letter Reports for each site	FFP	$26,389
	2017 Annual Monitoring Reports for each site	FFP	$26,389
6.3	Groundwater Sampling and Reporting (Two Rounds)		
	2013 Round 1 Monitoring Report for each site	FFP	$35,977
	2013 Round 2 Monitoring Report for each site	FFP	$35,977
6.4	Installation of 10 Groundwater Wells (30 ft bgs)	FFP	$44,179
7	UHOT ECP Phase Effort		
7.1	UHOT ECP Phase Addendum Report	FFP	$15,330
8	Community Relations Support	FFP	$140,999
8.1	(Optional) Community Relations Meeting Support	FUP	$14,750

NOTE: The table shows only major milestone deliverables, but proposes draft and draft-final documents as interim milestones. 75% of total shall be paid at draft, 15% at draft-final, and 10% at final.

Section B - Supplies or Services and Prices

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
0001		1	Lump Sum	$2,397,140.94	$2,397,140.94

Fort Monmouth RI/FS/Closure Support
FFP
The objective of this task order is to address a number of environmental sites at Fort Monmouth BRAC 05 facility that are in various stages of hazardous, toxic and radiological waste (HTRW) investigation and remediation. No MMRP work is planned. 1) perform remedial investigations and feasibility studies to achieve acceptance of Decision Document(s) in compliance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA and 2) support the closure and site close-out of environmental sites, preferably to unrestricted use (with the exception of the landfill areas) which will facilitate the efficient transfer of real property to other parties. The objective of this work is to achieve site closeout to unrestricted use.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT		$2,397,140.94

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000101			Lump Sum	$0.00	$0.00

RI0090-61050002 FTMM M2 RIFS [369857]
FFP
Funded in the amount of $123,175.60 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT		$0.00
ACRN AA CIN: W31RYO227106200001		$123,175.60

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000102			Lump Sum	$0.00	$0.00

RI0091-61050003 FTMM M3 RIFS [369857]
FFP
Funded in the amount of $123,175.60 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT		$0.00
ACRN AB CIN: W31RYO227106200002		$123,175.60

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000103			Lump Sum	$0.00	$0.00

RI0092-61050004 FTMM M4 RIFS [369857]
FFP
Funded in the amount of $123,175.60 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AC	$123,175.60

CIN: W31RYO227106200003

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000104			Lump Sum	$0.00	$0.00

RI0093-61050005 FTMM M5 RIFS [369857]
FFP
Funded in the amount of $123,175.60 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AD	$123,175.60

CIN: W31RYO227106200004

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000105			Lump Sum	$0.00	$0.00

RI0094-61050008 FTMM M8 RIFS [369857]
FFP
Funded in the amount of $123,175.60 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AE	$123,175.60

CIN: W31RYO227106200005

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000106			Lump Sum	$0.00	$0.00

RI0095-61050012 FTMM M12 RIFS [369857]
FFP
Funded in the amount of $123,175.60 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AF	$123,175.60

CIN: W31RYO227106200006

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000107			Lump Sum	$0.00	$0.00

RI0096-61050014 FTMM M14 RIFS [369857]
FFP
Funded in the amount of $123,175.60 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AG	$123,175.60

CIN: W31RYO227106200007

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000108			Lump Sum	$0.00	$0.00

RI0097-61050018 FTMM M18 RIFS [369857]
FFP
Funded in the amount of $123,175.60 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AH	$123,175.60

CIN: W31RYO227106200008

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000109			Lump Sum	$0.00	$0.00

RI0098-61050022 FTMM M22 RIFS [369857]
FFP
Funded in the amount of $166,225.37 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AJ	$166,225.37

CIN: W31RYO227106200009

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000110			Lump Sum	$0.00	$0.00

RI0099-61050025 FTMM M25 RIFS [369857]
FFP
Funded in the amount of $123,175.60 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AK	$123,175.60

CIN: W31RYO227106200010

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000111			Lump Sum	$0.00	$0.00

RI0100-61050053 FTMM M53 RIFS [369857]
FFP
Funded in the amount of $166,225.37 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AL	$166,225.37

CIN: W31RYO227106200011

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000112			Lump Sum	$0.00	$0.00

RI0101-61050054 FTMM M54 RIFS [369857]
FFP
Funded in the amount of $126,846.21 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AM	$126,846.21

CIN: W31RYO227106200012

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000113			Lump Sum	$0.00	$0.00

RI0102-61050055 FTMM M55 RIFS [369857]
FFP
Funded in the amount of $126,846.21 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AN	$126,846.21

CIN: W31RYO227106200013

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000114			Lump Sum	$0.00	$0.00

RI0103-61050056 FTMM M56 RIFS [369857]
FFP
Funded in the amount of $126,846.21 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AP	$126,846.21

CIN: W31RYO227106200014

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000115			Lump Sum	$0.00	$0.00

RI0104-61050059 FTMM M59 RIFS [369857]
FFP
Funded in the amount of $155,653.38 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AQ	$155,653.38

CIN: W31RYO227106200015

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000116			Lump Sum	$0.00	$0.00

RI0105-61050061 FTMM M61 RIFS [369857]
FFP
Funded in the amount of $126,846.21 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AR	$126,846.21

CIN: W31RYO227106200016

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000117			Lump Sum	$0.00	$0.00

RI0106-61050066 FTMM M66 RIFS [369857]
FFP
Funded in the amount of $126,846.21 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AS	$126,846.21

CIN: W31RYO227106200017

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
000118			Lump Sum	$0.00	$0.00

RI0107-61050068 FTMM M68 RIFS [369857]
FFP
Funded in the amount of $166,225.37 in accordance with the Task Listing that reflects funding allocation by site.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00
ACRN AT	$166,225.37

CIN: W31RYO227106200018

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
0005		2	Lump Sum	$0.00	$0.00 NC

Contractor Manpower Reporting
FFP
This CLIN is used for the pricing of the collection and reporting of Contractor Manpower Reporting data as described in Section C. Reporting period will be the period of performance not to exceed twelve months ending 30 September of each Government Fiscal Year and must be reported by 31 October of each calendar year.
FOB: Destination
MILSTRIP: W31RYO22710620
PURCHASE REQUEST NUMBER: W31RYO22710620

MAX NET AMT	$0.00

Section C - Descriptions and Specifications

PWS DATED 30AUG2012

Performance Work Statement
Remedial Investigation / Feasibility Study / Decision Documents
Fort Monmouth
Oceanport, Monmouth County, New Jersey
Project No. 369857
30 Aug 2012

1.0 OBJECTIVE:

The objective of this task order is to address a number of environmental sites at Fort Monmouth BRAC 05 facility that are in various stages of hazardous, toxic and radiological waste (HTRW) investigation and remediation. No MMRP work is planned. 1) perform remedial investigations and feasibility studies to achieve acceptance of Decision Document(s) in compliance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA and 2) support the closure and site close-out of environmental sites, preferably to unrestricted use (with the exception of the landfill areas) which will facilitate the efficient transfer of real property to other parties. The objective of this work is to achieve site closeout to unrestricted use.

2.0 BACKGROUND:

The Fort Monmouth (FTMM) site is located in the central-eastern portion of New Jersey in Monmouth County, approximately 45 miles south of New York City, 70 miles northeast of Philadelphia, and 40 miles east of Trenton. The Atlantic Ocean is approximately 3 miles to the east. FTMM was comprised of three areas; Main Post (MP), the Charles Wood Area (CWA) and the Evans Area (EA) (see Appendix B, Figures). EA was located approximately 8 miles to the south of the MP and CWA and was formerly used for administrative, research and development and some training. EA was closed under BRAC 1998 and all but 2 acres have been transferred from the Fort Monmouth. FTMM falls within the Boroughs of Eatontown, Oceanport, and Tinton Falls. The MP is in the Eatontown and Oceanport Boroughs. The CWA is in the Eatontown and Tinton Falls Boroughs.

On September 15, 2011 FTMM was closed under the 2005 Base Realignment and Closure (BRAC) process. This PWS addresses certain areas of environmental concern on the former MP and the CWA. MP includes 637 acres and the CWA covers 489 acres (see Appendix B, Figures). The primary mission of FTMM was to provide command, administrative, and logistical support for Headquarters, U.S. Fort Monmouth Communications and Electronics Command (CECOM). CECOM is a major subordinate command of the U.S. Fort Monmouth Material Command (AMC) and was the host activity. Fort Monmouth was the center for the development of the Fort Monmouth's Command and Control Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) systems, formerly the primary tenants of the Fort. Much of the Fort Monmouth's research and development of high-tech systems was done at Fort Monmouth.

FTMM is divided into three areas MP, CWA and the EA. The MP provided supporting administrative, training, and housing functions, as well as many of the community and industrial facilities for FTMM. These facilities were distributed across the property, with no distinct clustering of functions. The CWA was used primarily for research and development (R&D), testing, housing, and recreation. The CWA research, development and testing facilities occupied the southwest corner of the sub-post. The northwest corner formerly held residential units but is currently undeveloped. Residential units currently occupy the southeastern boundary and the golf course occupies the northeast corner.

Site Specific information will be provided with the request for proposal for contractor review and use via either a designated Internet site or delivery of recorded data on CD/DVD. This information may include but is not limited to general site history, previous investigations and other documentation.

3.0 GENERAL REQUIREMENTS:
The Contractor shall perform all work in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP), 40 CFR Part 300 and to the extent possible to meet the requirements of N.J. A.C. 7:26 E Technical Requirements for Site Remediation. All activities involving work in areas potentially containing hazards shall be conducted in full compliance with United States Corps of Engineers (USACE), Department of the Army (DA), and Department of Defense (DOD) regulations and policies.

3.0.1 Contractor Methods: This is a performance based task order with some tasks being firm fixed price and others being cost plus fixed fee. The performance objectives and standards included herein are the basis of the task order requirements. The technical approach and level of effort expended to achieve task order objectives and standards are solely up to the contractor to select and adjust as necessary through the life of the task order. Government recognizes the contractor's right to change the technical approach and level of effort from that proposed with the understanding that the contractor shall still meet all project objectives and gain government Quality Assurance acceptance in order to receive payment. Given the short time available during the pre-award phase to evaluate the site it is possible that after award and refinement of the conceptual site model and data needs that the contractor will wish to adjust the investigation strategy.

3.0.2 Quality monitoring and measurement: The contractor will be evaluated periodically during performance of this task order to ensure compliance with the proposed and accepted performance goals, regulations, guidance and Data Item Descriptions (DIDs), and to document that acceptance criteria (AC), delivery schedule, and the overall completion date are being met. This evaluation will be performed according to a Quality Assurance Surveillance Plan (QASP). A programmatic QASP will be provided by the government as a starting point for the contractor-prepared Draft QASP per Task 2. The government will finalize the contractor's Draft QASP. This final QASP will be supplied to the contractor and used by the government to evaluate the contractor's performance. Failure to adequately complete any service or submittal to at least a satisfactory level of quality or timeliness may result in a repeat of the work, or a poor performance evaluation, or both.

3.0.3 Performance Requirements. Performance requirements are addressed in each task and summarized in the Performance Requirements Summary (PRS) provided in Attachment A. Performance metrics are provided in Attachment B. If discrepancies or ambiguity exists between the documents, the order of precedence is 1) the Task; 2) Performance Requirements Summary; 3) Performance Metrics.

3.0.4 Task pricing: A pricing schedule is provided in Attachment C which will be used as a basis for negotiation of price increase or decrease due to government changes in the specified performance objectives. The Contractor must perform all the necessary environmental investigation, restoration work and reporting as required to meet the performance objectives of this PWS. The contractor shall:

- Review historical site reports and documentation
- Conduct remedial investigations (RI) to determine the nature and extent of contamination
- Prepare Feasibility Studies in accordance with CERCLA and to the extent possible to meet the requirements of N.J. A.C. 7:26 E Technical Requirements for Site Remediation
- Prepare CERCLA compliant Proposed Plans and Decision Documents
- Review NJDEP comments to the ECP, complete any required sampling and prepare a report documenting conclusions and recommendations
- Performance of groundwater sampling (annually and quarterly)
- Review internal comments a ECP Underground Heat Oil Tank (UHOT) addendum report, prepare a report documenting conclusions and recommendations
- Perform "optional" investigations, studies and possible removal actions of UHOTs on a as needed basis and
- Perform Project Management activities.
- For RI/FS projects - Provide price For QC System including a full time QC Manager separate from project supervision, who will provide: a Monthly QC Reports that will provide information on Scheduled Work; Work Accomplished; Inspections; Sampling and Analysis; Deficiencies and or Deficiency Correction; Changes; and Instructions given. The Monthly Reports will be provided to the COR along with schedule updates and monthly vouchers to be uploaded in the Army VCE.
- For Removal Action and Implementation of Presumptive Remedies type Landfill capping projects either fixed price and / or cost type contracts; provide pricing for a QC System including a full time QC Manager for each project separate from project supervision, who will provide: Daily and Monthly QC Reports that will provide information on Scheduled Work; Work Accomplished; Inspections; Sampling and Analysis; Deficiencies and or Deficiency Correction; Changes; and Instructions given. The Daily Reports will be provided to the USACE Oversight the morning following the work day of the report. The Monthly Reports will be provided to the COR along with schedule updates and monthly vouchers to be uploaded in the Army VCE.

The Contractor also shall use the PWS sampling tables provided to determine the basis of preparing your proposals (such as number of soils samples needed in the FS to complete the

design of the landfill caps, number of groundwater samples and parameters needed for quarterly and annual monitoring as well as ECP addendum sampling).

3.1 Task 1 – Kick off Meeting, Project Management Plan and Schedule (Firm Fixed Price task)

Objective: Attend a project kick-off meeting at FTMM. Prepare, submit and gain acceptance of a PMP that details how the contractor will implement work and comprehensive plans covering all aspects of site characterization, preparation of work plans, preparation of decision documents and project execution. Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) is only required for environmental sampling.

Performance Standard: Prepare the PMP that details coordination of project activities to ensure that all stakeholders are kept informed of the project status, existing or potential problems, and any changes required to prudently manage the project and meet the needs of the Installation's project stakeholders and decision-makers. The Contractor will develop and maintain a detailed Project Management Plan (PMP). The PMP, based on the schedule prepared as part of the Contractor proposal, will specify the schedule, technical approach, and resources required for the planning, execution, and completion of the performance objectives. The first draft of the PMP will be due within thirty (30) calendar days of contract award. The draft PMP and subsequent revisions will be subject to FTMM and USACE review and approval through the Contracting Officer's Representative (COR). The final PMP will be due within fifteen (15) calendar days of comments received from the COR. A payment milestone will be established for USACE approval of the final PMP through the COR.

AC: Acceptance of PMP with two revisions required.

Measurement / Monitoring: Review of PMP to verify that the minimum acceptable content has been provided and meets applicable guidance.

Incentives/Disincentives: Satisfactory or greater **Contractor Performance Assessment Rating System** (CPARS) rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: As part of the PMP, the Contractor will develop and maintain an activity-based schedule that fully supports the technical approach and outlines the due dates for all milestones and payable deliverables. A payment plan will be included with the schedule that allows for payments to the Contractor based on successful completion of interim milestones proposed by the Contractor. It is USACE's intent to make all payments after verification of progress in accordance with this schedule. The Contractor will coordinate activities with the COR to ensure that the proposed project schedule does not conflict with other contractor activities on site, or interrupt Installation mission activities.

As part of the PMP, the Contractor will identify and implement a means for providing monthly project status reports to the COR. The PMP will address the frequency and content of status reports.

The contractor shall organize and coordinate all meetings; identify and involve all stakeholders, upon approval by the Government; and be responsible for the logistics of these meetings to include, but not limited to, providing a facilitator, obtaining meeting location, and sending invitation letters (pending government review and acceptance).

3.2 Task 2, Remedial Investigation (RI)/Feasibility Study (FS) Work Plan (WP), Uniform Federal Policy for Quality Assurance Project Plan (UFP-QAPP) and QASP (Firm Fixed Price)

Objective: Prepare, submit and gain acceptance of 5 WPs, one (1) site wide UFP-QAPP and one (1) site wide Quality Assurance Surveillance Plan **(**QASP) that are detailed and comprehensive plans covering all aspects of site characterization, risk assessment and methodology, and project execution. UFP-QAPP is only required for environmental sampling. The WP should address but not be limited to following:

1. FS (with limited pre-design soil sampling) for 9 landfills.
2. RI/FS activities at sites requiring additional soil and groundwater contaminate delineation.
3. ECP sampling. This WP will address NJDEP comments requesting delineation sampling to address specific areas of concern in both soils and groundwater.
4. Quarterly and annual groundwater sampling. Sampling must be performed consistent with low flow sampling protocols and application NJDEP regulations. See Attachment B-3 for a summary of specific sampling parameters, sampling frequency and number of wells to be sampled.
5. Investigate Underground Heat Oil Tanks using standard geophysical methods, collect soil and groundwater samples as necessary, and perform removal and closure consistent with NJDEP regulations. This WP shall include soil and groundwater sampling protocols, processes for tank and piping decontamination, tank closure and removal from the site.

Performance Standard: Prepare the WP's in accordance with DID WERS-001.01 and other applicable guidance, and Related Activities as appropriate and other Interim Guidance as appropriate. Prepare the sampling and analysis plans, field sampling, and UFP-QAPP in accordance with EM 1110-1-4009, DID WERS-009.01, Intergovernmental Data Quality Task Force UFP-QAPP Manual, and to the extent possible with NJDEP regulations (N.J.A.C. 7:26E) as appropriate. UFP-QAPP content shall also meet the requirements of DoD Quality Systems Manual for Environmental Laboratories (current version). Draft QASP includes requirements in regulations, guidance, DIDs and the Quality Control Plan included in the WP.

AC: Acceptance of WP's, Site specific QASP and UFP-QAPP. Draft QASP reflects requirements of the WP and the Quality Control Plan (QCP) with one revision required.

Measurement / Monitoring: Review of WPs, Site specific QASP and UFP-QAPP to verify that the minimum acceptable content has been provided and meets applicable guidance.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: The sampling and analysis work plan (SAP) shall include the Contractor's phased approach, address contaminants of interest, sample media (soil/ groundwater/ sediment/surface water/air), and methods that will be utilized to ensure that data generated are of an acceptable quality for its intended use. The contractor shall discuss quantity, quality and the methods used to verify adherence to the NJDEP regulations (7:26E) for sample collection, handling, laboratory analysis, verification and validation.

3.3 Task 3 Performance of Landfill Feasibility Studies and Preparation of RI/FS Reports.

3.3.1 Task 3.1, Feasibility Study of Landfills (Firm Fixed Price task)

Objective: Prepare, submit and gain acceptance of Feasibility Studies for nine landfills thru the final deliverable with state regulator acceptance.

Performance Standard: Prepare a CERCLA compliant submission with a review of alternatives, and to the extent possible to meet the requirements of NJ. A.C. 7:26 E Technical Requirements for Site Remediation and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of submission with two revisions. One additional revision that will be acceptable to NJDEP.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: For most of the landfill sites, the site characterization is complete, so a review of remedial alternatives will need to be performed.

- FTMM-02 (Landfill M2), 8.1 acres
- FTMM-03 (Landfill M3), 8 acres
- FTMM-04 (Landfill M4), 1.4 acres
- FTMM-05 (Landfill M5), 3.2 acres
- FTMM-08 (Landfill M8), 7.2 acres
- FTMM-12 (Landfill M12), 7.1 acres
- FTMM-14 (Landfill M14), 6.9 acres
- FTMM-18 (Former Training Area) Landfill, 4.8 acres
- FTMM-25 (Landfill CW-3A), 2.6 acres

3.3.2 Task 3.2, Preparation of RI/FS Reports for the Landfills (Firm Fixed Price task)

Objective: Prepare, submit and gain acceptance of RI/FS Reports for nine landfills thru the final deliverable with state regulator acceptance.

Performance Standard: Prepare a CERCLA compliant submission with a compilation of previous sampling data and a review of alternatives and to the extent possible to meet the requirements of NJ. A.C. 7:26 E Technical Requirements for Site Remediation and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of submission with two revisions. One additional revision that will be acceptable to NJDEP.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: For most of the landfill sites, the site characterization is complete, so a review of remedial alternatives will need to be performed.

- FTMM-02 (Landfill M2), 8.1 acres
- FTMM-03 (Landfill M3), 8 acres
- FTMM-04 (Landfill M4), 1.4 acres
- FTMM-05 (Landfill M5), 3.2 acres
- FTMM-08 (Landfill M8), 7.2 acres
- FTMM-12 (Landfill M12), 7.1 acres
- FTMM-14 (Landfill M14), 6.9 acres
- FTMM-18 (Former Training Area) Landfill, 4.8 acres
- FTMM-25 (Landfill CW-3A), 2.6 acres

3.3.3 Task 3.3, Proposed Plan of Landfills (Firm Fixed Price task)

Objective: Prepare, submit and gain acceptance of a Proposed Plan (PP) for nine landfills.

Performance Standard: Prepare CERCLA compliant PP submission and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of submission with two revisions. One additional revision that will be acceptable to NJDEP.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: Preparation of a Proposed Plan report for 9 Landfills at Fort Monmouth (FTMM) and the list of sites are provided below:

- FTMM-02 (Landfill M2), 8.1 acres
- FTMM-03 (Landfill M3), 8 acres
- FTMM-04 (Landfill M4), 1.4 acres
- FTMM-05 (Landfill M5), 3.2 acres
- FTMM-08 (Landfill M8), 7.2 acres
- FTMM-12 (Landfill M12), 7.1 acres
- FTMM-14 (Landfill M14), 6.9 acres
- FTMM-18 (Former Training Area) Landfill, 4.8 acres

- FTMM-25 (Landfill CW-3A), 2.6 acres

3.3.4 Task 3.4, Decision Documents for Landfills (Firm Fixed Price task)

Objective: Prepare, submit and gain acceptance of a Decision Documents for nine landfills.

Performance Standard: Prepare a CERCLA compliant Decision Documents submission and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of submission with two revisions. One additional revision that will be acceptable to NJDEP.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: Preparation of a Decision Documents reports for 9 Landfills at Fort Monmouth (FTMM) and the list of sites is provided below:

- FTMM-02 (Landfill M2), 8.1 acres
- FTMM-03 (Landfill M3), 8 acres
- FTMM-04 (Landfill M4), 1.4 acres
- FTMM-05 (Landfill M5), 3.2 acres
- FTMM-08 (Landfill M8), 7.2 acres
- FTMM-12 (Landfill M12), 7.1 acres
- FTMM-14 (Landfill M14), 6.9 acres
- FTMM-18 (Former Training Area) Landfill, 4.8 acres
- FTMM-25 (Landfill CW-3A), 2.6 acres

3.3.5 Optional Task 3.5, Implementation of Presumptive Remedy of Landfills (Cost Plus Fixed Fee)

Objective: Implement the Decision Document which should meet the closure requirements for nine landfills (such as capping).

Performance Standard: Perform a remedy and achieve closure of nine (9) landfills and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of remedy as well as approval by NJDEP.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: Install a soil cap on 9 Landfills at Fort Monmouth (FTMM). The Presumptive remedy of a cap will include tasks such as clearing and grubbing each landfill (see acreage listed below). After clearing and grubbing has been completed of the top one foot of each landfill, the parcels will be graded (re-using existing site soils) and compacted. The contractor will compact the landfill to 90% verified using field instrumentation. After grading and compacting, an 18 inch "certified clean" soil cover will be placed over each landfill and another 6 inch "certified clean" top soil cover on top of that soil cover. The soil and topsoil capping materials will be placed in 6 inch lifts to ensure uniform compaction and minimize any subsidence. Silt fence will need to be installed to control erosion and the caps will need to be seeded with a hearty stable low growth grass (such as Buffalo Grass) that is compatible with FTMM climate and soil conditions. All erosion control measures will remain in place until the cap and grass cover have been firmly established (assume 6 months to one year after final seeding). Access roads (to the landfills) have been installed will not need to be covered and capped. Furthermore, stream stabilization material (rip rap) has been installed adjacent to landfills shall "not" be disturbed as part of this remedy. The contract will be required to remove silt fence upon the successful establishment of the grass cover and the list of sites is provided below:

- FTMM-02 (Landfill M2), 8.1 acres
- FTMM-03 (Landfill M3), 8 acres
- FTMM-04 (Landfill M4), 1.4 acres
- FTMM-05 (Landfill M5), 3.2 acres
- FTMM-08 (Landfill M8), 7.2 acres
- FTMM-12 (Landfill M12), 7.1 acres
- FTMM-14 (Landfill M14), 6.9 acres
- FTMM-18 (Former Training Area) Landfill, 4.8 acres
- FTMM-25 (Landfill CW-3A), 2.6 acres

3.4 Task 4, RI/FS, PP and DD at Various Sites (Firm Fixed Price/Fixed Unit Price)

3.4.1 Task 4.1 RI/FS Field Activities (Firm Fixed Price/Fixed Unit Price)

Objective: Conduct a remedial investigation(s) at new sites (listed below) in accordance with CERCLA, as amended, characterizing the nature and extent of contamination meeting the project DQOs and to the extent possible to meet the requirements of N.J. A.C. 7:26 E Technical Requirements for Site Remediation. This task shall include all field activities necessary to execute this task. For soil and groundwater contamination, the contractor shall collect sufficient data that meets the project DQOs as, of known quality and quantity to determine the nature and extent of contamination to support remedy selection and preparation of the FS.

Performance Standard: Conduct RI activities and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of RI activities. Acceptance of the RI activities by NJDEP regulators.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: The Contractor shall conduct RI field activities in accordance with CERCLA and to the extent possible in order to meet the N.J. A.C. 7:26 E Technical Requirements for Site Remediation. The RI shall also meet the requirements under the CERCLA such that the Fort Monmouth responsibilities for remedy selection at contaminated sites are met.

The list of RI sites is provided below:

- FTMM-22
- FTMM-53
- FTMM-59
- FTMM-68

3.4.2 Task 4.2, RI/FS Reports (Firm Fixed Price/Fixed Unit Price).

Objective: Prepare a summary RI/FS report for all sites and obtain regulator approval by the NJDEP.

Performance Standard: Prepare the RI/FS report and receive acceptance by the state regulators.

AC: NJDEP acceptance of the final RI/FS report.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: The Contractor shall provide the USACE and FTMM with draft documents (internal draft) RI/FS report for review and comment prior to submittal to NJDEP. The Contractor shall address all USACE and Fort Monmouth comments and obtain concurrence on submittals prior to submittal to NJDEP. The Fort Monmouth will provide the draft documents (external draft) to NJDEP for review and comment. The Contractor shall address NJDEP comments, as needed, to complete reports and obtain regulatory concurrence and USACE /Fort Monmouth approval. For purposes of work progress, the Contractor shall assume USACE will initiate all interface with NJDEP and will coordinate any comment resolution with the NJDEP.

The RI/FS report is for sites provided below:

- FTMM-22
- FTMM-53
- FTMM-59
- FTMM-68

3.5 Task 5, RI/FS at Additional Sites with RI Delineation Completed Previously (Firm Fixed Price/Fixed Unit Price)

3.5.1 Task 5.1, RI/FS Reports (Firm Fixed Price/Fixed Unit Price).

Objective: For other sites where the delineation has been completed by Fort Monmouth, the contractor shall prepare a summary RI/FS report for each site and obtain regulator approval by the NJDEP.

Performance Standard: Prepare the RI/FS report and receive acceptance by the state regulators.

AC: NJDEP acceptance of the final RI/FS report.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: The Contractor shall provide the USACE and FTMM with draft documents (internal draft) RI/FS report for review and comment prior to submittal to NJDEP. The Contractor shall address all USACE and Fort Monmouth comments and obtain concurrence on submittals prior to submittal to NJDEP. The Fort Monmouth will provide the draft documents (external draft) to NJDEP for review and comment. The Contractor shall address NJDEP comments, as needed, to complete reports and obtain regulatory concurrence and USACE /Fort Monmouth approval. For purposes of work progress, the Contractor shall assume USACE will initiate all interface with NJDEP and will coordinate any comment resolution with the NJDEP.

The RI/FS report is for sites provided below:

- FTMM-54
- FTMM-55
- FTMM-56
- FTMM-61
- FTMM-64
- FTMM-66

3.5.2 Task 5.2, Proposed Plan of RI/FS Sites (Firm Fixed Price task)

Objective: Prepare, submit and gain acceptance of a Proposed Plan (PP) for the RI/FS sites.

Performance Standard: Prepare CERCLA compliant PP submission and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of submission with two revisions. One additional revision that will be acceptable to NJDEP.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: Preparation of a Proposed Plan report for RI/FS sites at Fort Monmouth (FTMM) and the list of sites are provided below:

- FTMM-22
- FTMM-53
- FTMM-54
- FTMM-55
- FTMM-56
- FTMM-59
- FTMM-61
- FTMM-64
- FTMM-66
- FTMM-68

3.5.3 Task 5.3, Decision Documents for RI/FS sites (Firm Fixed Price task)
Objective: Prepare, submit and gain acceptance of a Decision Documents for RI/FS sites.

Performance Standard: Prepare a CERCLA compliant Decision Documents submission and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of submission with two revisions. One additional revision that will be acceptable to NJDEP.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: Preparation of a Decision Document for each RI/FS site at Fort Monmouth (FTMM). The list of sites is provided below:

- FTMM-22
- FTMM-53
- FTMM-54
- FTMM-55
- FTMM-56
- FTMM-59
- FTMM-61

- FTMM-64
- FTMM-66
- FTMM-68

3.6 Task 5.4, Investigations to Augment ECP Phase II SI Report (Firm Fixed Price/Fixed Unit Price)

Objective: Complete investigations and report findings to address NJDEP comments on ECP Phase II SI report.

Performance Standard: Conduct field sampling activities, prepare reports and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of reports with two revisions. One additional revision that will be acceptable to NJDEP.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: The Contractor shall perform review historical records and correspondence provided by Fort Monmouth. Contractor shall implement field sampling activities to address regulator comments, document findings in a Supplemental Site Investigation Report to address NJDEP comments on ECP Phase II SI report. Below is a list of parcels that require additional characterization and reporting.

Task 5.4.1, Parcel 28 located at Building 2525 Eatontown Lab - The former septic tank components need to be sampled in accordance with CERCLA and to the extent possible with NJDEP 7:26E-3.9(e) 3 and the groundwater sampling requirements of 7:26E-3.7 must also be followed.

Task 5.4.2, Parcel 38 located at Former Outdoor Pistol Range - A site investigation to determine if there are impacts in groundwater due to potential releases from the former firing range. Groundwater shall be investigated in accordance with CERCLA and to the extent possible with NJDEP 7:26E-3.7.

Task 5.4.3, Parcel 39 located at Building 1150 (Vail Hall) - NJDEP indicates soil must be compared to and delineated to Residential Direct Contact Soil Clean Up Criteria (RDCSCC). The data only indicate two low level of exceedances of PAH above residential levels and none above non-residential. Based on interaction with the NJDEP, it may or may not be necessary to conduct additional sampling.

Task 5.4.4, Parcel 49 located at Former Squier Laboratory Complex - additional delineation for PAH at select locations are required to address delineation of contaminants in soils. Delineation

of groundwater should be in accordance with CERCLA and to the extent possible with NJAC 7:26E-3.13(b) 4ii and NJAC 7:26E-3.13(b) 4ii (4).

Task 5.4.5, Parcel 57 located at Former Coal Storage and Railroad Unloading - 800 Area - Delineate PAH's in soils around the limited detections observed in ECP SI samples. Recollect soil samples from previous locations and analyze for PCBs.

Task 5.4.6, Parcel 61 located at Patterson Health Clinic Building 1075 - Conduct additional investigation to evaluate PAH contamination of soils near the door at the southeast corner of the building.

Task 5.4.7, Parcel 69 located at Building 900 Former Vehicle Repair/Motor Pool - Soil and sediment sample locations previously sampled shall be resampled and analyzed for PCBs. Groundwater shall be further evaluated in accordance with CERCLA and to the extent possible with NJAC 7:26E-4.4.

Task 5.4.8, Reporting – The contractor shall prepare an ECP Phase II SI Addendum report. The Contractor shall provide to USACE draft documents (internal draft) for review and comment prior to submittal to NJDEP. The Contractor shall address Army comments and obtain concurrence on submittals prior to submittal to NJDEP. The FTMM will provide the draft documents (external draft) to NJDEP for review and comment. The Contractor shall address NJDEP comments, as needed, to complete reports and obtain regulatory concurrence and FTMM approval. For purposes of work progress, the Contractor shall assume USACE will provide all interface with NJDEP and will coordinate any comment resolution with the NJDEP.

3.7 Task 6, Optional Task Groundwater Sampling and Reporting (Firm Fixed Price/Fixed Unit Price)

3.7.1 Task 6.1, Optional Task Groundwater Sampling and Reporting (Annual) (Firm Fixed Price/Fixed Unit Price)

Objective: At the direction of USACE, the contractor shall implement sampling of groundwater, prepare reports and submit reports for regulatory NJDEP review.

Performance Standard: Conduct field sampling activities, prepare reports and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of reports with two revisions. One additional revision that will be acceptable to NJDEP.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: The contractor shall perform groundwater sampling consistent with low flow sampling protocols and NJDEP regulations. The frequency and analytical

parameters for each location and site are provided on Attachment B-3. Some analytical sampling may need to be performed during season (high or low) water events, and direction for the planning of the sampling will be provided by USACE. The analytical information will be organized by site and the Contractor shall provide to USACE draft report documents (internal draft) for review and comment prior to submittal to NJDEP. The Contractor shall address Army comments and obtain concurrence on submittals prior to submittal to NJDEP. The FTMM will provide the draft report documents (external draft) to NJDEP for review and comment. The Contractor shall address NJDEP comments, as needed, to complete reports and obtain regulatory concurrence and FTMM approval. For purposes of work progress, the Contractor shall assume USACE will provide all interface with NJDEP and will coordinate any comment resolution with the NJDEP.

3.7.2 Task 6.2, Optional Task Groundwater Sampling and Reporting (Quarterly) (Firm Fixed Price/Fixed Unit Price)

Objective: Complete sampling of groundwater, prepare reports and submit reports for regulatory NJDEP review and comments

Performance Standard: Conduct field sampling activities, prepare reports and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of reports with two revisions. One additional revision that will be acceptable to NJDEP.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: The contractor shall perform groundwater sampling consistent with low flow sampling protocols and NJDEP regulations. The frequency and analytical parameters for each location and site are provided on Attachment B-3. Some analytical sampling may need to be performed during season (high or low) water events, and direction for the planning of the sampling will be provided by USACE. The analytical information will be organized by site and the Contractor shall provide to USACE draft report documents (internal draft) for review and comment prior to submittal to NJDEP. The Contractor shall address Army comments and obtain concurrence on submittals prior to submittal to NJDEP. The FTMM will provide the draft report documents (external draft) to NJDEP for review and comment. The Contractor shall address NJDEP comments, as needed, to complete reports and obtain regulatory concurrence and FTMM approval. For purposes of work progress, the Contractor shall assume USACE will provide all interface with NJDEP and will coordinate any comment resolution with the NJDEP.

3.7.3 Task 6.3 Optional Task Groundwater Monitoring Well Installation, Sampling and Reporting (Two Rounds) (Firm Fixed Price/Fixed Unit Price)

Objective: Complete the installation and sampling of additional groundwater monitoring wells, prepare reports and submit reports for regulatory NJDEP review and comments

Performance Standard: Conduct field activities, prepare reports and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of field efforts and reports with two revisions. One additional revision that will be acceptable to NJDEP.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: The contractor shall perform two rounds of groundwater monitoring well sampling consistent with NJDEP regulations and low flow sampling protocols. The frequency and analytical parameters for each location and site are provided on Attachment B-3. Some analytical sampling may need to be performed during season (high or low) water events, and direction for the planning of the sampling will be provided by USACE. The analytical information will be organized by site and the Contractor shall provide to USACE draft report documents (internal draft) for review and comment prior to submittal to NJDEP. The Contractor shall address Army comments and obtain concurrence on submittals prior to submittal to NJDEP. The FTMM will provide the draft report documents (external draft) to NJDEP for review and comment. The Contractor shall address NJDEP comments, as needed, to complete reports and obtain regulatory concurrence and FTMM approval. For purposes of work progress, the Contractor shall assume USACE will provide all interface with NJDEP and will coordinate any comment resolution with the NJDEP.

3.8 Task 7, UHOT ECP Phase

3.8.1 Task 7.1 UHOT ECP Phase Addendum Report (Firm Fixed Price task)

Objective: Develop an ECP Addendum based on investigations performed by FTMM to address internal Fort Monmouth comments on a draft ECP UHOT report.

Performance Standard: Prepare a draft final report based on information received from Fort Monmouth, and receive acceptance by the state regulators.

AC: USACE and FTMM acceptance of draft final report with two revisions. One additional revision that will be acceptable to NJDEP.

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: The Contractor shall finalize an Environmental Condition of Property (ECP) Report Addendum that addresses the Unregulated Heating Oil Tanks (UHOTs). Former Department of Public Works personnel prepared a draft ECP addendum to identify previously unidentified UHOTs based on review of existing geophysics, historic site maps, property records and a tank data base that had been developed. Much of this information was not reviewed or included in the original ECP report and the potential UHOTs need to be documented.

The Contractor shall provide to USACE and FTMM draft documents (internal draft) for review and comment prior to submittal to NJDEP. Contractor shall address all USACE and FTMM comments and obtain concurrence on submittals prior to submittal to NJDEP. USACE will provide the draft documents (external draft) to NJDEP for review and comment. The Contractor shall address NJDEP comments, as needed, to complete reports and obtain Regulatory concurrence and Army approval. For purposes of work progress, Contractor shall assume USACE will initiate all interface with NJDEP and will coordinate any comment resolution with the NJDEP.

3.9 Task 8, Community Relations Support: This task is a Firm Fixed Price task .
Objective: Successfully three public meetings and support the FTMM with community relations.

Performance Standard: Successfully three public meetings and support the FTMM with community relations.

AC: Acceptance of meeting materials with two revisions and acceptance of transcripts in one revision. Meetings held are organized; and professional in nature. Contractor personnel in attendance are thoroughly familiar with the project. Zero letters of reprimand, grievances, or formal complaints.

Measurement / Monitoring: Acceptance of required materials for meetings. Government will attend and evaluate the contractor's attendance, participation and professional demeanor.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating.

Specific Task Requirements: The Contractor shall attend quarterly Restoration Advisory Board meetings, prepare meeting announcements, meeting minutes, provide support, prepare presentation material and prepare meeting minutes over a period of 4 years. These meetings are different from and separate from Proposed Plan. If additional public meetings are required they will be funded separately in the attached price spreadsheet. These meetings will be held near the FTMM site; specific location to be determined. Support shall include, but is not limited to: preparation and delivery of briefings, graphics, maps, posters, and support of question and answer sessions during public meetings, supply printing services. The Contractor shall also obtain the meeting site, provide sound equipment as needed, perform public notification and prepare any correspondence necessary to meeting the objectives of this task. The government

shall approve **all** correspondence, public notices and all other materials prior to being presented/distributed to the public.

3.9.1 Task 8.1, Optional Community Relations Support: This task is a Firm Fixed Price task .

Objective: Successfully two public meetings and support the FTMM with community relations.

Performance Standard: Successfully two public meetings and support the FTMM with community relations.

AC: Acceptance of meeting materials with two revisions and acceptance of transcripts in one revision. Meetings held are organized; and professional in nature. Contractor personnel in attendance are thoroughly familiar with the project. Zero letters of reprimand, grievances, or formal complaints.

Measurement / Monitoring: Acceptance of required materials for meetings. Government will attend and evaluate the contractor's attendance, participation and professional demeanor.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating.

Specific Task Requirements: The Contractor shall attend quarterly Restoration Advisory Board meetings, prepare meeting announcements, meeting minutes, provide support, prepare presentation material and prepare meeting minutes over a period of 4 years. These meetings are different from and separate from Proposed Plan. If additional public meetings are required they will be funded separately in the attached price spreadsheet. These meetings will be held near the FTMM site; specific location to be determined. Support shall include, but is not limited to: preparation and delivery of briefings, graphics, maps, posters, and support of question and answer sessions during public meetings, supply printing services. The Contractor shall also obtain the meeting site, provide sound equipment as needed, perform public notification and prepare any correspondence necessary to meeting the objectives of this task. The government shall approve **all** correspondence, public notices and all other materials prior to being presented/distributed to the public.

Geographical Information System and Database Management (Firm Fixed Fee task)
Objective: Develop a database of electronic information (in MS Access) which includes all soil, sediment, surface water and groundwater data based on investigations performed by FTMM to date. This database and GIS system will have the capability to run site specific reports, review and print out site specific maps (from M2 thru M68) with site specific coverage and be able to compare information (and post data) compared to applicable EPA and NJDEP criteria. The costs for all GIS and database management services shall be incorporated into all of the project specific bid items listed on Attachment C. Task 8 has been deleted from the previous version of the PWS.

Performance Standard: Prepare of draft and final database/GIS system with acceptance by the USACE and Fort Monmouth as part of the study phases of this task.

AC: USACE and FTMM acceptance of draft and final with two versions..

Measurement / Monitoring: Review by Government using guidance cited to determine acceptability.

Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

Specific Task Requirements: All products associated with this TO that provide a map representation of the location of installation features (historical, existing, or planned) including installation maps, site plans, area development plans, walls-out as-built depictions, or other related overhead (plan) views of an installation (partial or entire) must adhere to the following requirements. (NOTE: This requirement does not currently involve walls-in facility floor plans or interior renderings.)
All maps and associated data must comply with the latest version of Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) available from the SDSFIE Web site: **http://www.sdsfie.org/**. These data will be organized using the current version of the standard approved by the Army as the functional lead for installation mapping and visualization. The SDSFIE will determine file and feature class identification and definition, attribution, and valid domain values. When any geospatial information collected as a result of the contract includes information identified in the Common Installation Picture (CIP) or recognized Mission Data Set (MDS), the Contractor will deliver data consistent with the established requirements for the data and will ensure functionality with the receiving system. Information must be collected at no less than 1:1200 scale for base cantonment areas, and 1:4800 scale for larger undeveloped base areas. Spatial data will meet or exceed National Map Accuracy Standards at those scales. Metadata will be provided and will use Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata (CSDGM) for organization.

As a requirement of this TO, the Contractor shall provide to the Government all shape files and Geospatial data accumulated as a result of investigation recorded on CDs (FedEx for delivery on next business day and also electronically. Geospatial data must be delivered in a geo-referenced GIS (Geographic Information System) format (feature-based file structures with one-to-one cardinality between spatial records and attribute records) which would include Environmental Systems Research Institute's (ESRI) shape file and geodatabase formats. All attribute data as specifically outlined in the task order contract must be included either in the GIS data file or as a separate table with a SDSFIE key variable that may be used to relationally join the separate table with the GIS data file. All geospatial data must be delivered in the North American Datum 1983 (NAD83) projection, State Plane Coordinate System, using feet or metric coordinate units. Mapping- or Survey-Grade Global Positioning Systems (GPS) or comparable traditional survey methods will be used to collect geospatial data. The use of mapping- or survey-grade GPS will depend on the precision requirements of the product data. These requirements will be specified later in this PWS for all contract activities where geospatial data are involved. Further information about precision requirements should be obtained from the installation GIO.
Source data and product data remain the property of the U.S. Government. The Contractor shall be required to explain and demonstrate the company's process for protecting all geospatial data

including, but not limited to, geometry, attributes, metadata, topologies, and relational database schemas and operations used in association with this PWS. The Contractor shall be required to sign a non-disclosure agreement attesting to the same before source data are released. Further information about security and non-disclosure requirements should be obtained from the installation GIO. Some installation map data, source and/or product, may be considered by the government to be "sensitive, but unclassified." The intent of this clause is to prevent intentional or unintentional dissemination of "sensitive, but unclassified" information to include unauthorized access to the source and product data by any entity wishing to do harm to the Army or United States Government while the data resides on the Contractor's computer network. The Contractor is not authorized to release this information to any third party without the explicit consent of the Army or USACE. All source information must be returned to the government POC or destroyed upon completion of this project. Special requirements for handling classified map data, if applicable, will be addressed elsewhere in this PWS.

Minimum Formatting Standards for CADD and GIS Deliverables

All maps and associated data will comply with the latest version of Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE). These data will be organized using the current version of the standard approved by the Army as the functional lead for installation mapping and visualization. The SDSFIE will determine file and feature class identification and definition, attribution, and valid domain values. If any geospatial information collected includes information identified in the Common Installation Picture (CIP) or recognized Mission Data Set (MDS), data will be delivered consistent with the established requirements for the data and will ensure functionality with the receiving system. Survey (or resource) grade Global Position Systems (GPS) or comparable traditional survey methods will be used to collect geospatial data (e.g., northing, easting, and elevation above or below the Earth's surface) for all contract activities where geospatial data is involved. This data will be obtained during the field program upon establishment of an environmental monitoring station (e.g., monitoring well, temporary well, soil sample location, surface water/sediment sample).

Information will be collected at no less than 1:1200 scale for base cantonment areas, and 1:4800 scale for larger undeveloped base areas. Spatial data will meet or exceed National Map Accuracy Standards at those scales. Metadata will be provided and will use Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata (CSDGM) for organization.

Geospatial data will be delivered in a geo-referenced GIS (Geographic Information System) format (feature-based file structures with one-to-one cardinality between spatial records and attribute records) which will include Environmental Systems Research Institute's (ESRI) shape file and geodatabase formats. All attribute data as specifically outlined in the task order contract will be included either in the GIS data file or as a separate table with a SDSFIE key variable that may be used to relationally join the separate table with the GIS data file. All geospatial data will be delivered in the North American Datum 1983 (NAD83) projection, State Plane Coordinate System, using feet or metric coordinate units. In addition, geospatial data will be delivered to the installation in an open Relational Database Management system (RDBMS) with the associated attribute data. Examples include, but are not limited to, obtaining precise global positioning

system (GPS) data for monitoring well locations. All source information will be returned to the government POC or destroyed upon completion of this project.

The contractor will complete a final update to the Fort Monmouth GIS and ERPIMS upload following issuance and concurrence from the USACE and Fort Monmouth of the Final Deliverables. The contractor will also load the database and GIS software (purchase of two licenses included) on to Fort Monmouth designated computer workstations. The contractor will also provide a manual which will detail the operations of the software.

3.9 Project Management. As part of the work at Fort Monmouth, the contractor will be required to perform certain project management tasks. These tasks are essential to the effective execution of the work. As such the contractor shall include project management costs into the proposed price of the work. Information provided below details the information required as part of this management task. The costs for all project management services shall be incorporated into all of the project specific bid items listed on Attachment C. Task 10 has been deleted from the previous version of the PWS.

3.9.1 Progress Reporting

3.9.1.1 Contractor Manpower Reporting

The Office of the Assistant Secretary of the Army (Manpower & Reserve Affairs) operates and maintains a secure Army data collection site where the contractor will report ALL contractor manpower (including subcontractor manpower) required for performance of this contract. The contractor is required to completely fill in all the information in the format using the following web address **https://contractormanpower.army.pentagon.mil** . The required information includes: (1) Contracting Office, Contracting Officer, Contracting Officer's Technical Representative; (2) Contract number, including task and delivery order number; (3) Beginning and ending dates covered by reporting period; (4) Contractor name, address, phone number, e-mail address, identity of contractor employee entering data; (5) Estimated direct labor hours (including sub-contractor); (6) Estimated direct labor dollars paid this reporting period (including sub-contractor); (7) Total payments (including subcontractor); (8) Predominant Federal Service Code (FSC) reflecting services provided by contractor (and separate predominant FSC for each sub-contractor if different); (9) Organizational title associated with the Unit Identification Code (UIC) for the Army Requiring Activity (the Army Requiring Activity is responsible for providing the contractor with its UIC for the purposes of reporting this information); (10) Locations where contractor and sub-contractors perform the work (specified by zip code in the United States and nearest City, Country, when in an overseas location, using standardized nomenclature provided on website); (12) Presence of deployment or contingency contract language, and, (13) Number of contractor and sub-contractor employees deployed in theater this reporting period (by country). As part of its submission, the contractor will also provide the estimated total cost (if any) incurred to comply with this reporting requirement. Reporting period will be the period of performance not to exceed 12 months ending September 30 of each government fiscal year and must be reported by 31 October of each calendar year.

3.9.1.2 Monthly Progress Report

The contractor shall submit by the 10th day of each month a monthly progress report summarizing activities of the preceding month (if at least 15 days of contract performance occurred in that month) and planned activities for the following month. The report shall be a concise summary and include at a minimum, the following information: (1) Contracting Office, Contracting Officer, Contracting Officer's Representative; (2) Contract number, including task and delivery order number; (3) Beginning and ending dates covered by the report; (4) Date of the report; (5) Contract completion date; (6) Contractor name, address, phone number, e-mail address, identity of contractor employee entering data; (7) Summary of accomplishments for the report month and planned accomplishments for the following month; (8) Safety reporting including field exposure hours and recordable and/or reportable accidents; (9) Record of deliverables submitted; (10) record of communication, correspondence, and invoices; (11) Estimate of percentage complete for each task and overall percentage complete; (12) Personnel changes, and, (13) If applicable an updated network analysis schedule.

Reports shall be submitted to the KO/COR in hard copy as well as via email. Email attachments, if any, shall be in Adobe pdf or MS Word format only. Email submittals shall include the project manager and **emdc.admin@usace.army.mil** on the cc line. The subject of the email shall be the contract number with task order followed by "Monthly Progress Report" followed by the year and month of the report (for example "W912DR-99-D-9999 9999 Monthly Progress Report YYYY MM"). The USACE PM (James T. Moore, CENAN-PP-E) and Technical Manager must be copied on all correspondence.

3.9.2 Photo Documentation.

The Contractor shall prepare digital photo documentation. The Contractor shall include photo documentation of field activities. If delays to this contract are encountered as a result of field activities, photos of those causes shall be provided and documented. Photography of any kind must be coordinated through the installation personnel.

3.9.3 Environmental Resources Program Information Management System (ERPIMS), NJDEP Hazsite EDS Data Management, and EPA Electronic Data Deliverables (EDDs)

The Contractor shall follow the data deliverable requirements of ERPIMS. Guidance to be followed includes the ERPIMS Data Loading Handbook and the ERP TOOLS X software. These documents are available on the ERPIMS Web page.

In addition to ERPIMS, the Contractor shall submit all data to NJDEP in accordance with the state's Hazsite/Electronic Data Submittal (EDS) program, and provide all data to FTMM (recorded on CDs) in Geobase format that is in compliance with spatial data standards (SDS), and using the state plane coordinate system NAD83. Information on the NJDEP requirements, including software may be found at **http://www.state.nj.us/dep/srp/hazsite**.

3.9.4 Meeting and Conference Services

The Contractor shall attend and/or support meetings and monthly teleconferences to discuss technical or regulatory issues and project progress and status. The Contractor shall prepare and submit for review presentation materials and accompanying agenda for meetings. The

Contractor shall prepare minutes for all meetings attended. The purpose of the meetings include, but are not limited to, contract discussions, progress reviews, project scoping, planning, design reviews, project status, and the general exchange of information concerning current and future activities.

3.9.5 Work Site Requirements

3.9.5.1 Safety Requirements

The Contractor shall be responsible for protecting the lives and health of employees and other persons on the work site; preventing damage to property, materials, supplies, and equipment; avoiding work interruptions; and complying with Occupational Safety and Health Administration (OSHA) regulations and installation safety office requirements. For areas not covered by OSHA, the Contractor shall comply with the U.S. Army Corps of Engineers Safety and Health Requirements Manuals, EM 385-1-1. The Contractor shall perform all operations in a prudent, conscientious, safe and professional manner and conform to the safety requirements contained in the contract. The Contractor shall maintain training records on site and have written Health and Safety Plans on site and available for workers and/or regulatory review. The Contractor shall provide the COR copies of any OSHA report(s) regarding a project site, submitted during the duration of this TO.

The Contractor shall record and report promptly (within 1 hour) by telephone, facsimile or other direct means to the COR, the installation POC, and to the military installation's Safety Office all available facts relating to each instance of damage to Government property or injury to a person. In the event of an accident/mishap, take reasonable and prudent action to establish control of the accident/mishap scene, prevent further damage to persons or property, preserve evidence until released by the accident/mishap investigative authority through the KO, and immediately report the incident to the Fire Department at 911. If the government elects to conduct an investigation of the accident/mishap, the Contractor shall cooperate fully and assist government personnel in the conduct of an investigation until said investigation is completed. The Contractor agrees that his personnel and equipment are subject to safety inspections by government personnel while on federal property.

3.9.5.2 Work-Site Maintenance

The Contractor shall maintain the work site to prevent the spread of contamination, provide for the safety of all individuals in the vicinity of the work site areas, and prevent the release of any contamination to the environment. The work site shall be well marked to prevent inadvertent entry into all work areas. Access to work areas shall be monitored and thoroughly controlled. Standard work zones and access points for controlled operations shall be established and maintained as the site conditions warrant. The Contractor shall ensure compliance with any federal, state, and local regulations and QA/QC protocols and procedures for decontaminating tools, equipment, or other materials, as required. The Contractor shall keep the work area free from accumulation of waste and non-essential hazardous materials. The Contractor shall remove non-essential equipment from the work site when not in use. The work site shall be maintained to present an orderly appearance and to maximize work efficiency. Before completing the work at each work location, the Contractor shall remove from the work premises any rubbish, tools, equipment, and materials that are not the property of the government. The Contractor shall properly dispose of all construction debris, investigation derived waste, and other waste(s) off base consistent with appropriate local, state and federal regulations. Upon completing the work,

the Contractor shall leave the area clean, neat, orderly, and return the work site(s) to the condition as specified under this TO.

The contractor shall provide onsite management for waste manifest documentation. Manifest management includes assigning all sequential manifest document numbers and tracking these numbers in a manifest log book. Soil shall be transported and disposed at a permitted waste facility. A US Government representative shall sign all hazardous waste manifests. The contractor is responsible for signing all non-hazardous material documentation for disposal.

Activities shall be planned and implemented in a manner that protects existing site utilities, structures, surface features, service operations, monitoring and other types of wells, and the general site environment. This includes the protection of trees, shrubs and other vegetation not in the affected zone from dust damage, soil compaction, and physical contact with machines and equipment. Also includes hand digging as necessary.

3.9.5.2 Storage

The Contractor shall be responsible for security and weatherproofing of stored material and equipment. Equipment or materials used in the work, requiring storage on the installation, shall be placed at site(s) designated by the installation POC. At the completion of the work, the Contractor shall remove all temporary fences and structures (used to protect materials and equipment) from the installation unless otherwise directed by the KO. The Contractor shall clean the storage area of all debris and material and perform repairs as required to return the site to its pre-project condition. The Contractor shall be responsible for safeguarding all government property provided for Contractor use. The Contractor shall maintain an inventory of government property, a copy of government property control procedures at the site, and dispose of government property as directed by the KO. All hazardous materials shall be handled, stored, labeled, and transferred in accordance with Resource Conservation and Recovery Act (RCRA) and OSHA regulations.

3.9.5.3 Site Access Badges

FTMM is currently operating with minimal staff. All contractors will be required to provide a minimum of 24 hrs notice to FTMM prior to contractors being allowed on site. Contractors and subcontractors shall be escorted at all times during field activities unless otherwise directed by USACE and Fort Monmouth.

4.0 SUBMITTALS:

Even though draft and draft final submittals are requested, the term “draft” shall not reflect upon the quality of the submittal being provided by the Contractor. Submittals shall include all supporting materials including supporting data whether electronic or hardcopy. Submittals not meeting the requirements of referenced guidance or Data Item Descriptions or missing supporting data may be rejected and revised by the contractor at the contractor’s own expense.

4.1 The Contractor shall deliver the specified number of copies shown in Table 4.2 of each report listed in Table 4-1 to the following addressees (addresses to be verified by Contractor):

US Army Corps of Engineers, Engineering & Support Center, Huntsville

Attn: CEHNC-CT-E (Ms. Jywanya Dillinger)
PO Box 1600
Huntsville, AL 35807-4301
4820 University Square
Huntsville, AL 35816-1822

US Army Corps of Engineers, New York District
Attn: CENAN-PP-E (Mr. James Moore)
26 Federal Plaza, Room 1811
New York, New York 10278

US Army Corps of Engineers, Baltimore District
Attn: CENAB-EN-HM (Ms. Sal Van Wert)
Environmental and Munitions Design Center
10 S. Howard Street
Baltimore, MD 21201
Phone: (410) 962-0674

U.S. Army Fort Monmouth
Attn: BRAC Environmental Coordinator (Ms. Wanda Green)
173 Riverside Drive
Fort Monmouth, NJ 07703 (plus one electronic copies for BRAC Office

Contractor to obtain and/or verify addresses.

4.2 Submittals and Due Dates.
The Contractor shall submit 1 copy of the entire submittal on a CD with each hard copy of a submittal (Reports, Plans, etc) in accordance with DID WERS-007.01. Hardcopies shall be printed on both sides of the paper whenever possible.

Table 4-1 List of Submittals

Submittal	Due Date (Calendar Days)
Task 1 - Kickoff Meeting, PMP and QASP	7 days after Kickoff phone conference
Task 2 - Work Plan – Landfills, RIFS etc	45 days after kickoff conference call
Task-3.1 FS M2	Draft Final 60 days after the approval of the WP
FS M3	Draft Final 60 days after the approval of the WP
FS M4	Draft Final 60 days after the approval of the WP
FS M5	Draft Final 60 days after the approval of the WP
FS M8	Draft Final 60 days after the approval of the WP
FS M12	Draft Final 60 days after the approval of the WP
FS M14	Draft Final 60 days after the approval of the WP
FS M18	Draft Final 60 days after the approval of the WP
FS M25	Draft Final 60 days after the approval of the WP

Task-3.2	RI/FS M2	Draft Final 90 days after the approval of the WP
	RI/FS M3	Draft Final 90 days after the approval of the WP
	RI/FS M4	Draft Final 90 days after the approval of the WP
	RI/FS M5	Draft Final 90 days after the approval of the WP
	RI/FS M8	Draft Final 90 days after the approval of the WP
	RI/FS M12	Draft Final 90 days after the approval of the WP
	RI/FS M14	Draft Final 90 days after the approval of the WP
	RI/FS M18	Draft Final 90 days after the approval of the WP
	RI/FS M25	Draft Final 90 days after the approval of the WP
Task 3.3	PP M2	Draft Final 30 days after RI/FS acceptance by NJDEP
	PP M3	Draft Final 30 days after RI/FS acceptance by NJDEP
	PP M4	Draft Final 30 days after RI/FS acceptance by NJDEP
	PP M5	Draft Final 30 days after RI/FS acceptance by NJDEP
	PP M8	Draft Final 30 days after RI/FS acceptance by NJDEP
	PP M12	Draft Final 30 days after RI/FS acceptance by NJDEP
	PP M14	Draft Final 30 days after RI/FS acceptance by NJDEP
	PP M18	Draft Final 30 days after RI/FS acceptance by NJDEP
	PP M25	Draft Final 30 days after RI/FS acceptance by NJDEP
Task-3.4	DD M2	Draft Final 30 days after PP acceptance by NJDEP
	DD M3	Draft Final 30 days after PP acceptance by NJDEP
	DD M4	Draft Final 30 days after PP acceptance by NJDEP
	DD M5	Draft Final 30 days after PP acceptance by NJDEP
	DD M8	Draft Final 30 days after PP acceptance by NJDEP
	DD M12	Draft Final 30 days after PP acceptance by NJDEP
	DD M14	Draft Final 30 days after PP acceptance by NJDEP
	DD M18	Draft Final 30 days after PP acceptance by NJDEP
	DD M25	Draft Final 30 days after PP acceptance by NJDEP
Task- 3.5	RAC M2	365 days after DD acceptance by NJDEP
	RAC M3	365 days after DD acceptance by NJDEP
	RAC M4	365 days after DD acceptance by NJDEP
	RAC M5	365 days after DD acceptance by NJDEP
	RAC M8	365 days after DD acceptance by NJDEP
	RAC M12	365 days after DD acceptance by NJDEP
	RAC M14	365 days after DD acceptance by NJDEP

RAC M18	365 days after DD acceptance by NJDEP
RAC M25	365 days after DD acceptance by NJDEP
Task 4.1 RIFS Field Activities M22	Draft Final 60 days after acceptance of the WP
RIFS Field Activities M53	Draft Final 60 days after acceptance of the WP
RIFS Field Activities M59	Draft Final 60 days after acceptance of the WP
RIFS Field Activities M68	Draft Final 60 days after acceptance of the WP
Task 4.2	
FS/Report M22	Draft Final 60 days after completion of Sampling
FS/Report M53	Draft Final 60 days after completion of Sampling
FS/Report M59	Draft Final 60 days after completion of Sampling
FS/Report M68	Draft Final 60 days after completion of Sampli
Task 4.3 RIFS Report M22	Draft Final 90 days after acceptance of the WP
RIFS Report M53	Draft Final 90 days after acceptance of the WP
RIFS Report M59	Draft Final 90 days after acceptance of the WP
RIFS Report M68	Draft Final 90 days after acceptance of the WP
Task 5.1 4	
Task 5.1 RI/FS Report M54	Draft Final 90 days after completion of Sampling
RI/FS Report M55	Draft Final 90 days after completion of Sampling
RI/FS Report M56	Draft Final 90 days after completion of Sampling
RI/FS Report M61	Draft Final 90 days after completion of Sampling
RI/FS Report M64	Draft Final 90 days after completion of Sampling
RI/FS Report M66	Draft Final 90 days after completion of Sampling
Task 5.2 PP M22	Draft Final 30 days after RI/FS acceptance by NJDEP
PP M53	Draft Final 30 days after RI/FS acceptance by NJDEP
PP M54	Draft Final 30 days after RI/FS acceptance by NJDEP
PP M55	Draft Final 30 days after RI/FS acceptance by NJDEP
PP M56	Draft Final 30 days after RI/FS acceptance by NJDEP
PP M59	Draft Final 30 days after RI/FS acceptance by NJDEP
PP M61	Draft Final 30 days after RI/FS acceptance by NJDEP
PP M64	Draft Final 30 days after RI/FS acceptance by NJDEP

PP M66	Draft Final 30 days after RI/FS acceptance by NJDEP
PP M68	Draft Final 30 days after RI/FS acceptance by NJDEP
Task 5.3 DD M22	Draft Final 30 days after PP acceptance by NJDEP
DD M53	Draft Final 30 days after PP acceptance by NJDEP
DD M54	Draft Final 30 days after PP acceptance by NJDEP
DD M55	Draft Final 30 days after PP acceptance by NJDEP
DD M56	Draft Final 30 days after PP acceptance by NJDEP
DD M59	Draft Final 30 days after PP acceptance by NJDEP
DD M61	Draft Final 30 days after PP acceptance by NJDEP
DD M64	Draft Final 30 days after PP acceptance by NJDEP
DD M66	Draft Final 30 days after PP acceptance by NJDEP
DD M68	Draft Final 30 days after PP acceptance by NJDEP
Task 5.5.1 ECP Parcel 28	Sampling completed 30 days after approval of the WP
Task 5.5.2 ECP Parcel 38	Sampling completed 30 days after approval of the WP
Task 5.5.3 ECP Parcel 39	Sampling completed 30 days after approval of the WP
Task 5.5.4 ECP Parcel 49	Sampling completed 30 days after approval of the WP
Task 5.5.5 ECP Parcel 57	Sampling completed 30 days after approval of the WP
Task 5.5.6 ECP Parcel 61	Sampling completed 30 days after approval of the WP
Task 5.5.7 ECP Parcel 69	Sampling completed 30 days after approval of the WP
Task 5.5.8 ECP Report	Draft Final 90 days after completion of Sampling
Task 6 Optional GW Sampling VOCs	
Task 6.1 Annual GW Sampling	Draft 75 days after completion of Sampling
Task 6.2 Quarterly GW Sampling	Draft 75 days after completion of Sampling
Task 6.3 Two Rounds GW Sampling	Draft 75 days after completion of Sampling
Task 7 UHOT ECP Report	
Task 7.1 UHOT ECP Addendum Report	Draft closure report due 75 days after start
Task 8 Community Relations	Quarterly support to meetings

4.3 Submittal Quantities

Provide the number of submittals shown in Table 4-2 to the addressees given in Section 4.2. No draft documents shall be released to the regulatory community until reviewed by the government.

Table 4-2 Submittal Guidance

	Draft Documents Hard/Electronic Copies	Draft Final/Final Documents	
KO/COR	1/1 each	1/1 each	
USAESCH	1/1	1/1	
CENAN/CENAB	2/2	2/2	
FTMM & Others	/4	5/7	7

4.4 Review Period: The contractor shall include at least a minimum 14 day review period for USACE and Fort Monmouth, and 90 day review period for the regulators.

4.5 Period of Performance: The Completion Date for this Task Order is September 2017.

5.0 MILESTONE PAYMENTS: (for firm fixed price tasks): Milestones will be considered met or completed when the required QC documentation has been submitted, QA completed and the submittal and/or product are accepted. Any payment vouchers submitted that do not coincide with the final accepted milestones or do not have the appropriate QC documentation will be rejected. All payments will be made utilizing an agreed upon Payment Milestone Schedule. The Contractor shall provide suggested milestones for payment. Milestones for payment shall be shown on the project schedule.

5.1 The following is a list of potential milestones for payment:

- Final Submittals: upon government acceptance, for example: Final WP
- Field Work: for defined units and activities completed and QA review and acceptance, for

example: Final QC density data package.

- Meetings: after completion of meetings with government acceptance of meeting minutes, for

example: Final PP meeting transcripts.

6.0 REFERENCES:

6.1 Refer to “Base Contract.”

6.2 Data Items Descriptions at the following website:

http://www.hnd.usace.Fort Monmouth.mil/engr/WERS.aspx .

7.0 GENERAL CONDITIONS: See the Base Contract Section C, Section 10 General Conditions and the following addendums:

7.1 This is a performance based task order. The inclusion of unit prices in the proposal shall in no way be construed to mean that the Government is procuring a specified number of units of any given service.

7.2 Government acceptance of the proposed technical approach and/or price does not relieve the Contractor from full responsibility for the viability, productivity, and efficiency of the approach used to meet the performance requirements of the PWS at the price proposed. The task order is for the provision of services that ultimately meet the performance requirements of this task. If the contractor must adjust its technical approach or perform more field work than anticipated in order to achieve the proposed performance goal then the contractor will do so with no change in task order price.

7.3 If the Government at its sole discretion chooses to modify the performance standard the parties to this task order will assess the impact on the estimated amount of field work required to achieve the new performance standards and will negotiate a price adjustment based upon the unit prices providing as price proposal supporting documentation

7.4 The Contractor attests that it applied due diligence in the research and development of its proposal has priced reasonable estimates of the site conditions and the associated risks into the price. The Contractor accepts full and sole responsibility for identifying and considering all factors that may affect the cost to execute the work. The act of signing this task order signifies that the Contractor has been given ample opportunity to assess the conditions under which the work will be performed and the Contractor either fully understands those conditions or has factored the risk into the price.

7.5 The Government provided the Contractor with historical documents and documents from previous site activities. The Contractor attests it interpreted the data utilizing an experienced understanding of how the data of this type is collected, analyzed, interpreted, and presented.

Attachment A
Performance Requirements Summary:

A.1 The Contractor shall meet the following performance requirements. Performance requirements are addressed in each task and summarized in the following Performance Requirements Summary. If discrepancies or ambiguity exists between the documents, the order of precedence is 1) the Task; 2) Performance Requirements Summary; 3) Performance Metrics

Table A-1 Performance Requirements Summary

Task	Objective	Performance Standard	Minimum Acceptable Criteria	Measurement / Monitoring	Incentive/ Disincentive
1	Attend a project kick-off meeting at FTMM. Prepare, submit and gain acceptance of a PMP that details how the contractor will implement work and comprehensive plans covering all aspects of site characterization, preparation of work plans, preparation of decision documents and project execution.	Prepare the PMP that details coordination of project activities to ensure that all stakeholders are kept informed of the project status, existing or potential problems, and any changes required to prudently manage the project and meet the needs of the Installation's project stakeholders and decision-makers.	Acceptance of PMP with two revisions required.	Review of PMP to verify that the minimum acceptable content has been provided and meets applicable guidance.	Satisfactory or greater Contractor Performance Assessment Reporting System (CPARS) rating/poor CPARS rating and/or re-performance of work at contractor's expense.
2	Prepare, submit and gain acceptance of 5 WPs, one (1) site wide UFP-QAPP and one (1) site wide Quality	Prepare the WP's in accordance with DID WERS-001.01 and other applicable	Acceptance of WP's, Site specific QASP and UFP-QAPP. Draft QASP reflects requirements	Review of WPs, Site specific QASP and UFP-QAPP to verify that the minimum acceptable content has been provided	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at

	Assurance Surveillance Plan **(**QASP) that are detailed and comprehensive plans covering all aspects of site characterization, risk assessment and methodology, and project execution. UFP-QAPP is only required for environmental sampling.	guidance, and Related Activities as appropriate and other Interim Guidance as appropriate.	of the WP and the Quality Control Plan (QCP) with one revision required.	and meets applicable guidance.	contractor's expense.
3a	Prepare, submit and gain acceptance of a Feasibility Studies for nine landfills thru the final deliverable with state regulator acceptance.	Prepare a CERCLA compliant submission with a review of alternatives, and to the extent possible to meet the requirements of N.J. A.C. 7:26 E Technical Requirements for Site Remediation and receive acceptance by the state regulators.	USACE and FTMM acceptance of submission with two revisions. One additional revision that will be acceptable to NJDEP.	Review by Government using guidance cited to determine acceptability.	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.
3b	Prepare, submit and gain acceptance of a Proposed Plan (PP) for nine landfills.	Prepare CERCLA compliant PP submission and receive acceptance by the state regulators.	USACE and FTMM acceptance of submission with two revisions. One additional revision that will be	Review by Government using guidance cited to determine acceptability.	Preparation of a Proposed Plan report for 9 Landfills at Fort Monmouth (FTMM)

			acceptable to NJDEP.		
3c	Prepare, submit and gain acceptance of a Decision Documents for nine landfills.	Prepare a CERCLA compliant Decision Documents submission and receive acceptance by the state regulators.	USACE and FTMM acceptance of submission with two revisions. One additional revision that will be acceptable to NJDEP.	Review by Government using guidance cited to determine acceptability.	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense
3d	Implement the Decision Document which should meet the closure requirements for nine landfills (such as capping).	Perform a remedy and achieve closure of nine (9) landfills and receive acceptance by the state regulators.	USACE and FTMM acceptance of remedy as well as approval by NJDEP.	Review by Government using guidance cited to determine acceptability.	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.
4	Conduct a remedial investigation(s) at new sites (listed below) in accordance with CERCLA, as amended, characterizing the nature and extent of contamination meeting the project DQOs and to the extent possible to meet the requirements of N.J. A.C. 7:26 E Technical Requirements for Site Remediation	Conduct a RI/FS and receive acceptance by the state regulators.	USACE and FTMM acceptance of RI/FS. Acceptance of the RI/FS by NJDEP regulators.	Review by Government using guidance cited to determine acceptability.	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.
4a	Prepare a summary RI/FS report for all sites and obtain regulator approval	Prepare the RI/FS report and receive acceptance by	NJDEP acceptance of the final RI/FS report.	Review by Government using guidance cited to determine	Satisfactory or greater CPARS rating/poor CPARS rating

	by the NJDEP.	the state regulators		acceptability.	and/or re-performance of work at contractor's expense.
4b	For other sites where the delineation has been completed by Fort Monmouth, the contractor shall prepare feasibility studies at sites in accordance with CERCLA, as amended, characterizing the nature and extent of contamination meeting the project DQOs and to the extent possible to meet the requirements of N.J. A.C. 7:26 E Technical Requirements for Site Remediation	USACE and FTMM acceptance of FS. Acceptance of the FS by NJDEP regulators.	USACE and FTMM acceptance of FS. Acceptance of the FS by NJDEP regulators.	Review by Government using guidance cited to determine acceptability.	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.
5	Complete investigations and report findings to address NJDEP comments on ECP Phase II SI report for various sites.	Conduct field sampling activities, prepare reports and receive acceptance by the state regulators.	USACE and FTMM acceptance of reports with two revisions. One additional revision that will be acceptable to NJDEP.	Review by Government using guidance cited to determine acceptability.	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense
6	At the direction of USACE, the contractor shall implement sampling of groundwater, prepare reports and submit reports for regulatory	Conduct field sampling activities, prepare reports and receive acceptance by the state regulators.	USACE and FTMM acceptance of reports with two revisions. One additional revision that will be acceptable to	Review by Government using guidance cited to determine acceptability.	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

	NJDEP review		NJDEP		
6a	Complete sampling of groundwater, prepare reports and submit reports for regulatory NJDEP review and comments	Conduct field sampling activities, prepare reports and receive acceptance by the state regulators.	USACE and FTMM acceptance of reports with two revisions. One additional revision that will be acceptable to NJDEP	Review by Government using guidance cited to determine acceptability.	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.
6b	Complete the installation and sampling of additional groundwater monitoring wells, prepare reports and submit reports for regulatory NJDEP review and comments	Conduct field activities, prepare reports and receive acceptance by the state regulators.	USACE and FTMM acceptance of field efforts and reports with two revisions. One additional revision that will be acceptable to NJDEP.	Review by Government using guidance cited to determine acceptability.	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.
7	Develop an ECP Addendum based on investigations performed by FTMM to address internal Fort Monmouth comments on a draft ECP UHOT report.	Prepare a draft final report based on information received from Fort Monmouth, and receive acceptance by the state regulators.	USACE and FTMM acceptance of draft final report with two revisions. One additional revision that will be acceptable to NJDEP	Review by Government using guidance cited to determine acceptability.	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.
7a	Perform an investigation/and or complete remediation of UHOTs on a per tank basis as directed by USACE. This optional task that will be exercised subject to the direction of	Conduct an investigation of Underground Heat Oil Tanks using standard geophysical methods, collect soil and groundwater	UHOT closure and acceptance by NJDEP on a per tank basis.	Review by Government using guidance cited to determine acceptability.	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

	USACE. For costing purposes please review the information provided below.	samples as necessary. Perform removal and closure			

		consistent with NJDEP regulations			
8	Develop a database of electronic information (in MS Access) which includes all soil, sediment, surface water and groundwater data based on investigations performed by FTMM to date. This database and GIS system will have the capability to run site specific reports, review and print out site specific maps (from M2 thru M68) with site specific coverages and be able to compare information (and post data) compared to applicable EPA and NJDEP criteria. Performance Standard: Prepare of draft and final database/GIS system with acceptance by the USACE and Fort Monmouth.	Prepare of draft and final database/GIS system with acceptance by the USACE and Fort Monmouth.	USACE and FTMM acceptance of draft and final with two versions.	Review by Government using guidance cited to determine acceptability.	Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.
9	Successfully three public meetings and support the FTMM with community relations.	Successfully three public meetings and support the FTMM with community relations.	Acceptance of meeting materials with two revisions and acceptance of transcripts in one revision. Meetings held are organized;	Acceptance of required materials for meetings. Government will attend and evaluate the contractor's attendance, participation and	Satisfactory or greater CPARS rating/poor CPARS rating..

			and professional in nature. Contractor personnel in attendance are thoroughly familiar with the project. Zero letters of reprimand, grievances, or formal complaints.	professional demeanor.	

Attachment B
PERFORMANCE METRICS

B.1 Performance Metrics for Performance Assessment Record (PAR)

	Exceptional	**Very Good**	**Satisfactory**	**Marginal**	**Unsatisfactory**
PAR Category: Quality of Product or Service					
Performance indicator: Document reviews					
Draft Plans, Reports, and documents [Plans, documents and reports are considered draft until accepted as final by the Government]	All contract-milestone documents accepted as submitted	No substantive comments (i.e. limited to grammar, spelling, terminology) to any of the documents, but a few exceptions were noted and corrected	Contractor met Acceptance Criteria	One or more documents required revisions to be resubmitted for approval prior to proceeding. Two backchecks were required on one or more documents before original comments were resolved satisfactorily.	One or more documents did not comply with contract requirements, or one or more documents required more than two backchecks before original comments were resolved satisfactorily, or more than one document was rejected.
Performance indicator: Project Execution					
Process Compliance	Zero Corrective Action Requests (CAR) or 948s	{2} CARs/948s for non-critical violations to WP requirements	Contractor met Acceptance Criteria	{6} CARs/948s for non-critical violations and/or {2} CARs/948 for critical violations	{>6} CARS for non-critical violations and/or {>2} CARs/948s for critical violations, or any unresolved CARs

	Exceptional	**Very Good**	**Satisfactory**	**Marginal**	**Unsatisfactory**
Project Execution	Zero letters of reprimand, grievances, or formal complaints AND one or more unsolicited letters of commendation		Contractor met Acceptance Criteria	{One} letter of reprimand, grievance or formal complaint that was resolved through negotiation	More than {one} letter of reprimand, grievance or formal complaint that were resolved through negotiation
Task Completion			Contractor met Acceptance Criteria		Final data and QC documentation submitted but not accepted
PAR Category: Schedule					
Performance indicator: Timely completion of tasks					
Final Plans and Reports, project milestones, T.O. invoices	All document submittals and task order milestones and invoices complete and accepted by T.O date, project closed out/final invoice approved ahead of schedule	Project closed out/final invoice accepted ahead of schedule	Project closed out/final invoice accepted on T.O. date	Project closed out/final invoice accepted within 30 calendar days after T.O. date.	Project closed out/final invoice accepted more than 30 calendar days after T.O. date.
Project status reports accurate			Yes		No
Performance indicator: Impacts to schedule					
Impacts caused by Contractor			Yes		No

	Exceptional	Very Good	Satisfactory	Marginal	Unsatisfactory
or other causes identified, in writing to HNC CO/ PM, in a timely manner to apply acceptable corrective actions.					
PAR Category: Cost Control (Not Applicable for Firm Fixed Price)					
Performance indicator: No unauthorized cost overruns					
Unauthorized cost overruns			No		Yes
Total Project Costs	Total contract invoices less than 98% of T.O. authorized amount	Total contract invoices greater than 98% but less than 99.99%of T.O. authorized amount	Total contract invoices between 99.99% and 100% of T.O. authorized amount	Total contract invoices greater than 100% but less than 105% of T.O. authorized amount	Total contract invoices greater than or equal to 105% of T.O. authorized amount
Performance indicator: Monthly cost report					
Monthly cost reports accurate			Yes		No
Performance indicator: Impacts to cost					
Impacts caused by Contractor or other causes identified, in writing to HNC CO/PM, in a timely manner to apply acceptable corrective actions.			Yes		No
PAR Category: Business Relations					
Performance indicator: Met contractual obligations					

	Exceptional	**Very Good**	**Satisfactory**	**Marginal**	**Unsatisfactory**
Corrective Actions taken were timely and effective (Refer to CARs issued to Contractor)			Yes		No
Performance indicator: Professional and Ethical Conduct					
Meetings and correspondences with Public, project delivery team and other stakeholders	Zero letters of reprimand, grievances, or formal complaints AND one or more unsolicited letters of commendation		Contractor met Acceptance Criteria	One letter of reprimand, grievance or formal complaint that was resolved through negotiation	More than one letter of reprimand, grievance or formal complaint that were resolved through negotiation OR removal of one or more project personnel as a results of a letter of reprimand, grievance or formal complaint.
Performance indicator: Customer has overall satisfaction with work performed					
Customer survey results for rating period	4.0-5.0	3.0-3.9	2.0-2.9	1.0-1.9	<1.0
Performance indicator: Personnel responsive and cooperative					
Key personnel responsive, and cooperative	Always		Most Times		Almost Never
PAR Category: Management of Key Personnel and Resources					
Performance indicator: Personnel knowledgeable and effective in their areas of responsibility					
Personnel assigned to tasks	All personnel proposed by Contractor were assigned to		All personnel proposed by Contractor were assigned to project; some	All personnel proposed by Contractor were assigned to project; some	All personnel proposed by Contractor were assigned to project, some

	Exceptional	Very Good	Satisfactory	Marginal	Unsatisfactory
	project; some personnel were substituted by higher qualified individuals.		personnel were substituted by equally qualified individuals.	personnel were substituted by equally qualified individuals, Letter of reprimand received for personnel conduct from HNC.	personnel were substituted by lesser qualified individuals or HNC requested, in writing, removal of assigned personnel for poor performance.
Performance indicator: Personnel able to manage resources efficiently					
Instances when resource management had negative impact on project execution	0	1-2	3-4	5-6	>6
PAR Category: Safety					
Performance indicator: Accidents and Violations					
*No Class A Accidents, Contractor at fault	0 No class A accidents IAW AR 385-40	No class A accidents IAW AR 385-40	Contractor met Acceptance Criteria	{<2} non-explosive related Class C accidents, or {1} non-explosive Class B accident, IAW AR 385-10	{1} Any Class A accident IAW AR-385-10, or Any explosive related accident.
*Major safety violations	0 accidents/injuries No safety violations	0 accidents/injuries No safety violations		{2} non-explosive safety violations.	{>1} any violation of procedures for handling, storage, transportation, or use of explosives IAW the WP, and all Federal,

	Exceptional	Very Good	Satisfactory	Marginal	Unsatisfactory
					State and local laws/ordinances.
*Minor safety violations	No safety violations	1 safety violation		{3} safety violations	{>3} safety violations

Classes of Accidents:

- **Class A:** Fatality or permanent total disability (Government Civilian, Military Personnel, and/or Contractor), or >$2,000,000 property damage.

- **Class B:** Permanent partial disability or impatient hospitalization of 3 or more persons (Government Civilian, Military Personnel, and/or Contractor), $500,000< $2,000,000 property damage.

- **Class C:** Lost Workday (Contractor) or Lost Time (Government Civilians), $50,000< $500,000 property damage.

- **Class D:** $2000 < $50,000 property damage.

* From Section C of Solicitation Number W912DY-04-R-0003, Amendment 000 W912DY-08-R-0016, Amendment 0007 (may be included but are not limited to these).

The following guidelines are provided for issuing ratings that are subjective in nature, these ratings will be supported by the weight of evidence documented during the government's surveillance efforts:

Exceptional: Performance *meets* contractual requirements and *exceeds many* to the Government's benefit. The contractual performance of the element or sub-element being assessed was accomplished with *few minor problems* for which corrective actions taken by the Contractor were *highly effective*.

Very Good: Performance *meets* contractual requirements and *exceeds some* to the Government's benefit. The contractual performance of the element or sub-element being assessed was accomplished with *some minor problems* for which corrective actions taken by the Contractor were *effective*.

Satisfactory: Performance *meets* contractual requirements. The contractual performance of the element or sub-element contains *some minor problems* for which corrective actions taken by the Contractor *appear or were satisfactory*.

Marginal: Performance *does not meet all* contractual requirements. The contractual performance of the element or sub-element being assessed reflects a *serious problem* for which the Contractor has *not yet identified corrective actions*. The Contractor's proposed actions appear only *marginally effective or were not fully implemented.*

Unsatisfactory: Performance *does not meet most* contractual requirements and *recovery is not likely* in a timely manner. The contractual performance of the element or sub-element contains *serious problems* for which the Contractor's corrective actions *appear or were ineffective.*

Attachment C

PRICE SPREADSHEET

Fort Monmouth BRAC Site

Task, Title, Type	Task Pricing	Unit Price	Units	Number of Units	Total
1, Kick Off Meetings, PMP, QASP	FFP		LS		
Additional Meetings	FUP		EA	2	
2, RI/FS Work Plans (5), UFP-QAPP and QASP	FFP		LS		
3, Performance of Landfill Feasibility Studies and Preparation of RI/FS Reports					
3.1 Feasibility Studies of Landfills					
3.1.1 FS M2 Landfill	FFP		LS		
3.1.2 FS M3 Landfill	FFP		LS		
3.1.3 FS M4 Landfill	FFP		LS		
3.1.4 FS M5 Landfill	FFP		LS		
3.1.5 FS M8 Landfill	FFP		LS		
3.1.6 FS M12 Landfill	FFP		LS		
3.1.7 FS M14 Landfill	FFP		LS		
3.1.8 FS M18 Landfill	FFP		LS		
3.1.9 FS M25 Landfill	FFP		LS		
3.2 RI/FS Reports for Landfills					
3.2.1 RI/FS M2 Landfill	FFP		LS		
3.2.2 RI/FS M3 Landfill	FFP		LS		
3.2.3 RI/FS M4 Landfill	FFP		LS		
3.2.4 RI/FS M5 Landfill	FFP		LS		
3.2.5 RI/FS M8 Landfill	FFP		LS		
3.2.6 RI/FS M12 Landfill	FFP		LS		
3.2.7 RI/FS M14 Landfill	FFP		LS		
3.2.8 RI/FS M18 Landfill	FFP		LS		
3.2.9 RI/FS M25 Landfill	FFP		LS		
3.3 Proposed Plan for Landfills					
3.3.1 Proposed Plan for M2 Landfill	FFP		LS		
3.3.2 Proposed Plan for M3 Landfill	FFP		LS		
3.3.3 Proposed Plan for M4 Landfill	FFP		LS		
3.3.4 Proposed Plan for M5 Landfill	FFP		LS		

3.3.5 Proposed Plan for M8 Landfill	FFP		LS		
3.3.6 Proposed Plan for M12 Landfill	FFP		LS		
Task, Title, Type	Task Pricing	Unit Price	Units	Number of Units	Total
3.3.7 Proposed Plan for M14 Landfill	FFP		LS		
3.3.8 Proposed Plan for M18 Landfill	FFP		LS		
3.3.9 Proposed Plan for M25 Landfill	FFP		LS		
3.4 Decision Documents for Landfills					
3.4.1 Decision Documents for Landfill M2	FFP		LS		
3.4.2 Decision Documents for Landfill M3	FFP		LS		
3.4.3 Decision Documents for Landfill M4	FFP		LS		
3.4.4 Decision Documents for Landfill M5	FFP		LS		
3.4.5 Decision Documents for Landfill M8	FFP		LS		
3.4.6 Decision Documents for Landfill M12	FFP		LS		
3.4.7 Decision Documents for Landfill M14	FFP		LS		
3.4.8 Decision Documents for Landfill M18	FFP		LS		
3.4.9 Decision Documents for Landfill M25	FFP		LS		
3.5 (Optional) Implementation of Presumptive Remedy of Landfills					
3.5.1 Implement Remedy at M2 Landfill	CPFF		LS		
3.5.2 Implement Remedy at M3 Landfill	CPFF		LS		
3.5.3 Implement Remedy at M4 Landfill	CPFF		LS		
3.5.4 Implement Remedy at M5 Landfill	CPFF		LS		
3.5.5 Implement Remedy at M8 Landfill	CPFF		LS		
3.5.6 Implement Remedy at M12 Landfill	CPFF		LS		
3.5.7 Implement Remedy at M14 Landfill	CPFF		LS		
3.5.8 Implement Remedy at M18 Landfill	CPFF		LS		
3.5.9 Implement Remedy at M25 Landfill	CPFF		LS		
4, RI/FS at Various Sites					
4.1 RI/FS Field Activities at Various Sites					
4.1.1 RI Activities at FTMM-22	FFP		LS		
4.1.2 RI Activities at FTMM-53	FFP		LS		
4.1.3 RI Activities at FTMM-59	FFP		LS		
4.1.4 RI Activities at FTMM-68	FFP		LS		
4.2 RI/FS Reports at Various Sites					
4.2.1 RI/FS Report at FTMM-22	FFP		LS		

4.2.2 RI/FS Report at FTMM-53	FFP		LS		
4.2.3 RI/FS Report at FTMM-59	FFP		LS		
4.2.4 RI/FS Report at FTMM-68	FFP		LS		
4.3 PP at Various Sites					
4.3.1 PP at FTMM-22	FFP		LS		
4.3.2 PP at FTMM-53	FFP		LS		
4.3.3 PP at FTMM-59	FFP		LS		
4.3.4 PP at FTMM-68	FFP		LS		
4.4 DD at Various Sites					
4.4.1 DD at FTMM-22	FFP		LS		
4.4.2 DD at FTMM-53	FFP		LS		
4.4.3 DD at FTMM-59	FFP		LS		
4.4.4 DD at FTMM-68	FFP		LS		
5, RI/FS at Additional Sites					
5.1 RI/FS Reports at Additional Sites					
5.1.1 RI/FS Report at FTMM-54	FFP		LS		
5.1.2 RI/FS Report at FTMM-55	FFP		LS		
5.1.3 RI/FS Report at FTMM-56	FFP		LS		
5.1.5 RI/FS Report at FTMM-61	FFP		LS		
5.1.6 RI/FS Report at FTMM-64	FFP		LS		
5.1.7 RI/FS Report at FTMM-66	FFP		LS		
5.2 Proposed Plan at Additional Sites					
5.2.1 Proposed Plan at FTMM-54	FFP		LS		

5.2.2 Proposed Plan at FTMM-55	FFP		LS		
5.2.3 Proposed Plan at FTMM-56	FFP		LS		
5.2.4 Proposed Plan at FTMM-61	FFP		LS		
5.2.5 Proposed Plan at FTMM-64	FFP		LS		
5.2.6 Proposed Plan at FTMM-66	FFP		LS		
5.3 Decision Documents at Additional Sites					
5.3.1 Decision Documents at FTMM-54	FFP		LS		
5.3.2 Decision Documents at FTMM-55	FFP		LS		
5.3.3 Decision Documents at FTMM-56	FFP		LS		
5.3.4 Decision Documents at FTMM-61	FFP		LS		
5.3.5 Decision Documents at FTMM-64	FFP		LS		
5.3.6 Decision Documents at FTMM-66	FFP		LS		
5.4 Investigations/Reporting to Augment ECP Phase II SI Report					
5.4.1 Parcel 28	FFP		LS		
5.4.2 Parcel 38	FFP		LS		
5.4.3 Parcel 39	FFP		LS		
5.4.4 Parcel 49	FFP		LS		
5.4.5 Parcel 57	FFP		LS		
5.4.6 Parcel 61	FFP		LS		
5.4.7 Parcel 69	FFP		LS		
5.4.8 Reporting	FFP		LS		
6, (Optional) Groundwater Sampling and Reporting					
6.1 Groundwater Sampling and Reporting (Annually)	FFP		LS		
6.2 Groundwater Sampling and Reporting (Quarterly)	FFP		LS		
6.3 Groundwater Sampling and Reporting (Two Rounds)	FFP		LS		
6.4 Installation of 10 Groundwater Wells (30 feet bgs)	FFP		LS		
7, UHOT ECP Phase Effort					
7.1 UHOT ECP Phase Addendum Report	FFP		LS		

8, Community Relations Support (assume 9 meetings)	FFP		LS		
8.1 (Optional) Community Relations Meeting Support	FUP		LS		

All FUPs are optional and may be exercised in increments of one or more units.

Appendix A

Applicable and Relevant Documentation

1. U.S. Army BRAC, 2007. Environmental Condition of Property Report – Fort Monmouth, Monmouth County, New Jersey. Final. January 29, 2007.
2. U.S. Army BRAC, 2007. Site Investigation Work Plan - Fort Monmouth, Monmouth County, New Jersey. Final. September 25, 2007.
3. Cabrera Services, Inc., 2007. Historical Site Assessment and Addendum to Environmental Conditions of Property Report, Fort Monmouth, Eatontown, New Jersey. January 2007.
4. Fort Monmouth Base Realignment and Closure Plans, Analysis, and Integration Office. December 8, 2006.
5. New Jersey Administrative Code. Technical Requirements for Site Remediation (N.J.A.C. 7:26E). July 2005.
6. U.S. Environmental Protection Agency (USEPA), 2002. Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils [Draft Subsurface Vapor Intrusion Guidance]. Office of Solid Waste and Emergency Response, Washington D.C. USEPA530-F-02-052.
7. New Jersey Department of Environmental Protection (NJDEP), 2005. Vapor Intrusion Guidance. Prepared by staff in the NJDEP Site Remediation and Waste Management Program (SRWMP) and the Division of Science, Research and Technology (DSRT). October 2005.
8. NJDEP, 2005. Field Sampling Procedures Manual.
9. Malcolm Pirnie, Inc., 2006. Final Historical Records Review Fort Monmouth, Fort Monmouth, New Jersey.
10. Fort Monmouth, 2006. Stormwater Pollution Prevention Plan (SPPP) Public Complex Permit (R-11), Main Post and Charles Wood Areas. March 2006.
11. Tetra Tech EM, Inc., 2005. Final Remedial Action Report for the 800, 700, and 400 Areas, U.S. Army Installation Fort Monmouth, Fort Monmouth, New Jersey. October 2005.
12. Versar, Inc., 2003. Remedial Investigation Report - M-18 Landfill Site. Prepared for U.S. Army DPW, Fort Monmouth, New Jersey. October 2003.
13. Cabrera Services, Inc., 2007. Radiological Scoping Survey Plan, Fort Monmouth, Eatontown, New Jersey. June 2007.
14. Roy F. Weston, Inc., 1993. Underground Storage Tank Closure and Site Investigation Report, Building 1122, NJDEPE UST Registration No. 81533-199. October 28, 1993.
15. Roy F. Weston, Inc., 1995. Site Investigation Report. December 1995.

Section E - Inspection and Acceptance

INSPECTION AND ACCEPTANCE TERMS

Supplies/services will be inspected/accepted at:

CLIN	INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
0001	Destination	Government	Destination	Government
000101	Destination	Government	Destination	Government
000102	Destination	Government	Destination	Government
000103	Destination	Government	Destination	Government
000104	Destination	Government	Destination	Government
000105	Destination	Government	Destination	Government
000106	Destination	Government	Destination	Government
000107	Destination	Government	Destination	Government
000108	Destination	Government	Destination	Government
000109	Destination	Government	Destination	Government
000110	Destination	Government	Destination	Government
000111	Destination	Government	Destination	Government
000112	Destination	Government	Destination	Government
000113	Destination	Government	Destination	Government
000114	Destination	Government	Destination	Government
000115	Destination	Government	Destination	Government
000116	Destination	Government	Destination	Government
000117	Destination	Government	Destination	Government
000118	Destination	Government	Destination	Government
0005	Destination	Government	Destination	Government

Section F - Deliveries or Performance

DELIVERY INFORMATION

CLIN	DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
0001	POP 30-SEP-2012 TO 30-SEP-2017	N/A	US ARMY ENGINEERING & SUPPORT CENTER NO CONTACT SPECIFIED CEHNC-CT 4820 UNIVERSITY SQUARE HUNTSVILLE AL 35816-1822 256-895-1110 FOB: Destination	W912DY
000101	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000102	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000103	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000104	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000105	POP 30-SEP-2012 TO 30-SEP-2012	N/A	N/A FOB: Destination	
000106	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000107	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000108	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000109	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000110	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000111	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000112	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	

000113	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000114	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000115	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000116	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000117	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
000118	POP 30-SEP-2012 TO 30-SEP-2017	N/A	N/A FOB: Destination	
0005	POP 30-SEP-2012 TO 30-SEP-2017	N/A	US ARMY ENGINEERING & SUPPORT CENTER NO CONTACT SPECIFIED CEHNC-CT 4820 UNIVERSITY SQUARE HUNTSVILLE AL 35816-1822 256-895-1110 FOB: Destination	W912DY

Section G - Contract Administration Data

ACCOUNTING AND APPROPRIATION DATA

AA: 21220500000 088130 3230CJ6L6070000000000 E314 01110
AMOUNT: $123,175.60
CIN W31RYO227106200001: $123,175.60

AB: 21220500000 088130 32306B82GH70000000000 E314 01110
AMOUNT: $123,175.60
CIN W31RYO227106200002: $123,175.60

AC: 21220500000 088130 3230FLL60570000000000 E314 01110
AMOUNT: $123,175.60
CIN W31RYO227106200003: $123,175.60

AD: 21220500000 088130 3230G2FG1L70000000000 E314 01110
AMOUNT: $123,175.60
CIN W31RYO227106200004: $123,175.60

AE: 21220500000 088130 32300H29F070000000000 E314 01110
AMOUNT: $123,175.60
CIN W31RYO227106200005: $123,175.60

AF: 21220500000 088130 32300BB34570000000000 E314 01110
AMOUNT: $123,175.60
CIN W31RYO227106200006: $123,175.60

AG: 21220500000 088130 32302963K870000000000 E314 01110
AMOUNT: $123,175.60
CIN W31RYO227106200007: $123,175.60

AH: 21220500000 088130 3230L7218170000000000 E314 01110
AMOUNT: $123,175.60
CIN W31RYO227106200008: $123,175.60

AJ: 21220500000 088130 32304118DK70000000000 E314 01110
AMOUNT: $166,225.37
CIN W31RYO227106200009: $166,225.37

AK: 21220500000 088130 3230G4D93270000000000 E314 01110
AMOUNT: $123,175.60
CIN W31RYO227106200010: $123,175.60

AL: 21220500000 088130 3230B2F0H270000000000 E314 01110
AMOUNT: $166,225.37
CIN W31RYO227106200011: $166,225.37

AM: 21220500000 088130 32308G3H2970000000000 E314 01110
AMOUNT: $126,846.21
CIN W31RYO227106200012: $126,846.21

AN: 21220500000 088130 32306GDG5D70000000000 E314 01110
AMOUNT: $126,846.21
CIN W31RYO227106200013: $126,846.21

AP: 21220500000 088130 3230B3L43H70000000000 E314 01110
AMOUNT: $126,846.21

CIN W31RYO227106200014: $126,846.21

AQ: 21220500000 088130 32300KD9J470000000000 E314 01110
AMOUNT: $155,653.38
CIN W31RYO227106200015: $155,653.38

AR: 21220500000 088130 32307CJ4B270000000000 E314 01110
AMOUNT: $126,846.21
CIN W31RYO227106200016: $126,846.21

AS: 21220500000 088130 3230DB346D70000000000 E314 01110
AMOUNT: $126,846.21
CIN W31RYO227106200017: $126,846.21

AT: 21220500000 088130 3230L69G1870000000000 E314 01110
AMOUNT: $166,225.37
CIN W31RYO227106200018: $166,225.37

APPENDIX B
FIELD FORMS

(This is a placeholder only; field forms are provided in the Sampling and Analysis Plan)

APPENDIX C
HISTORICAL INFORMATION

APPENDIX C-1
GENERAL HISTORICAL INFORMATION FOR FORT MONMOUTH

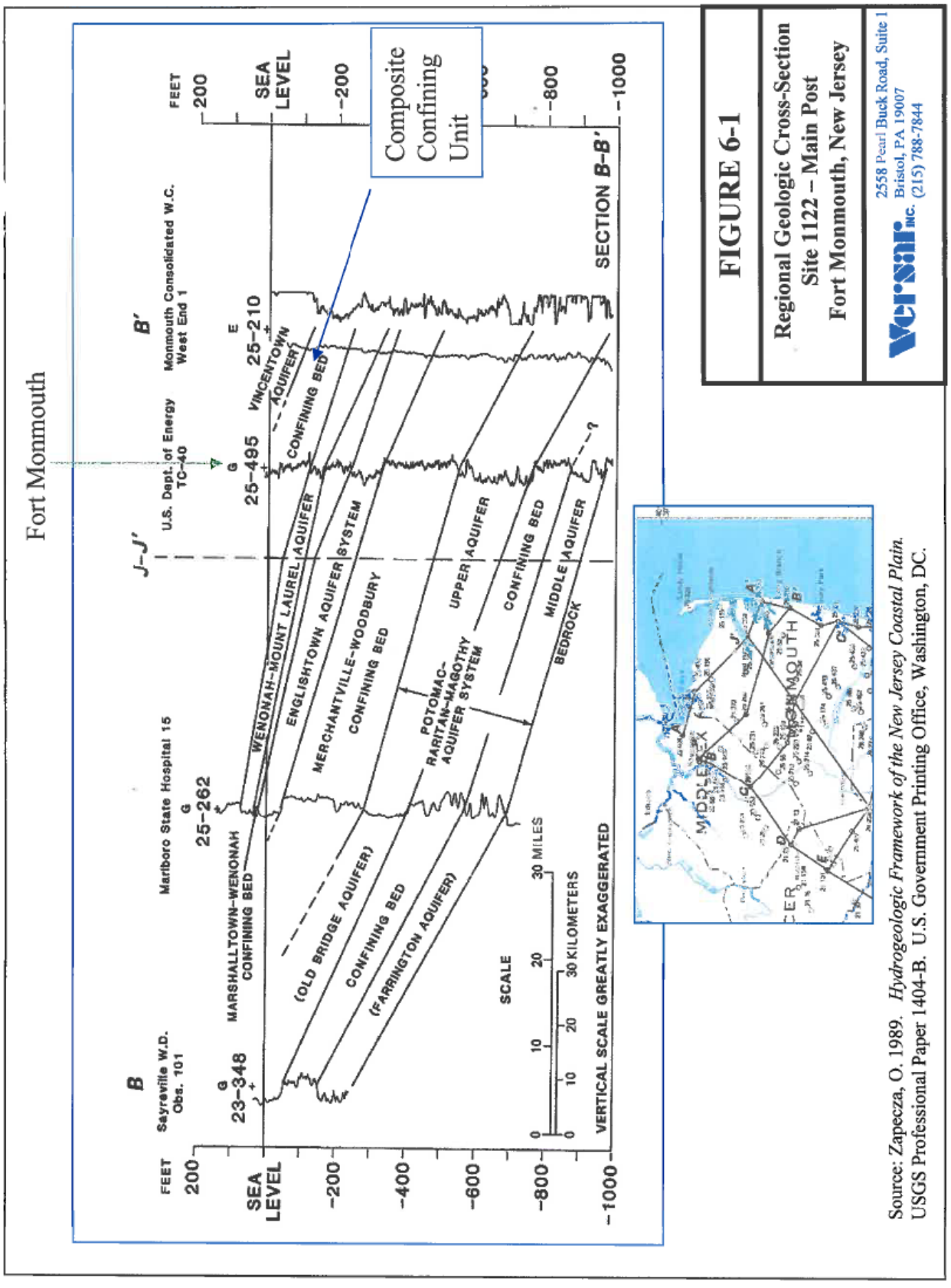

Fort Monmouth
B
Sayreville W.D. Obs. 101
G 23-348
B'
Marlboro State Hospital 15
G 25-262
J-J'
U.S. Dept. of Energy TO-40
G 25-495
Monmouth Consolidated W.C. West End 1
E 25-210
FEET
200
SEA LEVEL
-200
-400
-600
-800
-1000
MARSHALLTOWN-WENONAH CONFINING BED
WENONAH-MOUNT LAUREL AQUIFER
ENGLISHTOWN AQUIFER SYSTEM
MERCHANTVILLE-WOODBURY CONFINING BED
(OLD BRIDGE AQUIFER)
CONFINING BED
(FARRINGTON AQUIFER)
POTOMAC-RARITAN-MAGOTHY AQUIFER SYSTEM
VINCENTOWN AQUIFER
CONFINING BED
UPPER AQUIFER
CONFINING BED
MIDDLE AQUIFER
BEDROCK
?
SCALE
0 10 20 30 MILES
0 10 20 30 KILOMETERS
VERTICAL SCALE GREATLY EXAGGERATED
Composite Confining Unit
SECTION B-B'
MIDDLESEX
MONMOUTH
Source: Zapecza, O. 1989. Hydrogeologic Framework of the New Jersey Coastal Plain. USGS Professional Paper 1404-B. U.S. Government Printing Office, Washington, DC.
FIGURE 6-1
Regional Geologic Cross-Section
Site 1122 – Main Post
Fort Monmouth, New Jersey
Versar INC.
2558 Pearl Buck Road, Suite 1
Bristol, PA 19007
(215) 788-7844

TABLE 1
SUMMARY OF MEASURED HYDRAULIC CONDUCTIVITY VALUES
MAIN POST

Site	Well ID	Total Depth		Hyd. Conductivity (ft/day)	Hyd. Conductivity (ft/day)
Various Building Areas					
Bldg. 296	296MW01	15		6.90000000	6.90000000
Bldg. 290	290MW01	12.5		3.56000000	3.56000000
Bldg. 1122	1122MW02	15		0.84900000	0.84900000
Bldg. 1122	1122MW04	14		3.64000000	3.64000000
Bldg. 1122	1122MW03	14		7.10000000	7.10000000
Bldg. 108	108MW01	13		3.70000000	3.70000000
Bldg. 1122	1122MW05	15		4.38000000	4.38000000
Bldg. 1122	1122MW01	18		3.00000000	3.00000000
Bldg. 296	296MW02	12.5		2.47000000	2.47000000
Bldg. 290	290MW02	11.5		0.34200000	
Bldg. 296	296MW06	12.5		2.46000000	2.46000000
Bldg. 296	296MW03	12.5		14.30000000	
Bldg. 296	296MW08	12.5		6.04000000	6.04000000
Bldg. 296	296MW07	12.5		0.35000000	
Bldg. 80, 166	80MW03	12		6.30000000	6.30000000
Bldg. 296	296MW04	10		1.83000000	1.83000000
Bldg. 108	108MW03	13		31.70000000	
Bldg. 80, 166	80MW05	12		2.06000000	2.06000000
Bldg. 80, 166	80MW01	13		2.00000000	2.00000000
Bldg. 283	283MW03	20		4.38000000	4.38000000
Bldg. 283	283MW01	25		4.06000000	4.06000000
			Averages:	5.30671429	3.80876471
				(all)	(removed 2 highest + 2 lowest)
M-12 Landfill Area					
M-12 Landfill	M12MW24	18		3.34000000	3.34000000
M-12 Landfill	M12MW25	18		10.80000000	10.80000000
M-12 Landfill	M12MW22	18		0.79600000	0.79600000
M-12 Landfill	M12MW19	18		40.70000000	40.70000000
M-12 Landfill	M12MW16	14.5		0.58900000	0.58900000
M-12 Landfill	M12MW17	14.5		208.00000000	
M-12 Landfill	M12MW20	18		2.35000000	2.35000000
M-12 Landfill	M12MW21	18		3.69000000	3.69000000
M-12 Landfill	M12MW18	14.5		1.20000000	1.20000000
M-12 Landfill	M12MW23	18		97.80000000	97.80000000
M-12 Landfill	M12MW26	18		0.08990000	
			Averages:	33.57771818	17.91833333
				(all)	(removed 1 highest and 1 lowest)
M-18 Landfill Area					
M-18 Landfill	MP18MW25	14.5		3.09000000	3.09000000
M-18 Landfill	MP18MW24	14.5		2.89000000	2.89000000
			Averages:	2.99000000	

TABLE 1
SUMMARY OF MEASURED HYDRAULIC CONDUCTIVITY VALUES
MAIN POST

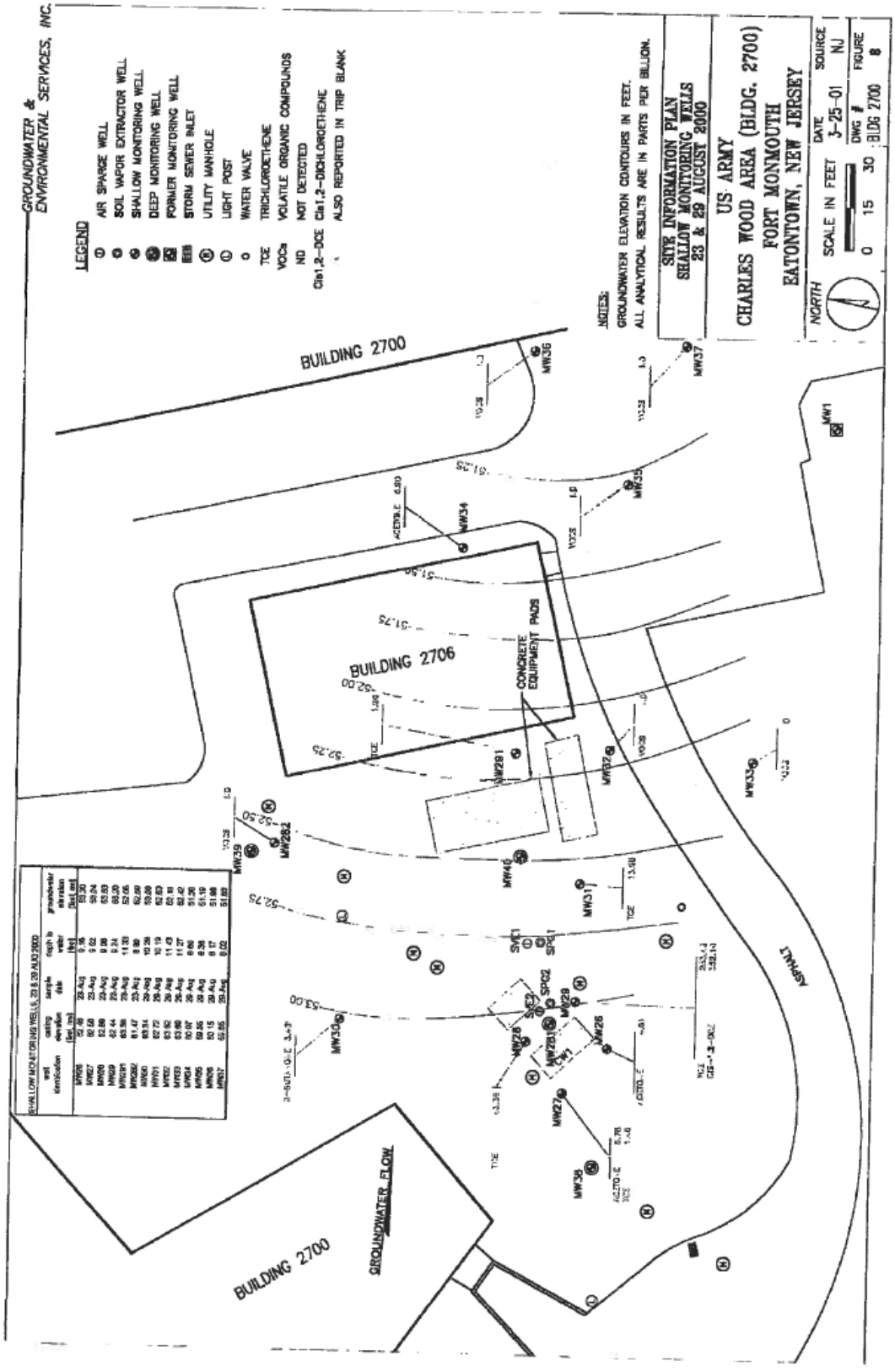
Site	Well ID	Total Depth		Hyd. Conductivity (ft/day)	Hyd. Conductivity (ft/day)
M-2 Landfill Area					
M-2 Landfill	M2MW13	20		0.00000217	0.00000217
M-2 Landfill	M2MW23	20		0.00000217	0.00000217
M-2 Landfill	M2MW18	20		0.00000176	0.00000176
M-2 Landfill	M2MW20	50		0.00000514	0.00000514
M-2 Landfill	M2MW12	50		0.00000124	0.00000124
			Averages:	**0.00000250**	**0.02496**
				(all)	**(multiplied by 10,000)***
		* NOTE: Pump test report suggests that these are too low by several orders of magnitude.			
				KEY	
					Hydraulic Conductivity
				=	Greater than 10 feet/day
				=	Between 5 - 10 feet/day
				=	Between 1 - 5 feet/day
				=	Between 0.01 - 1 feet/day
				=	Less than 0.01 feet/day

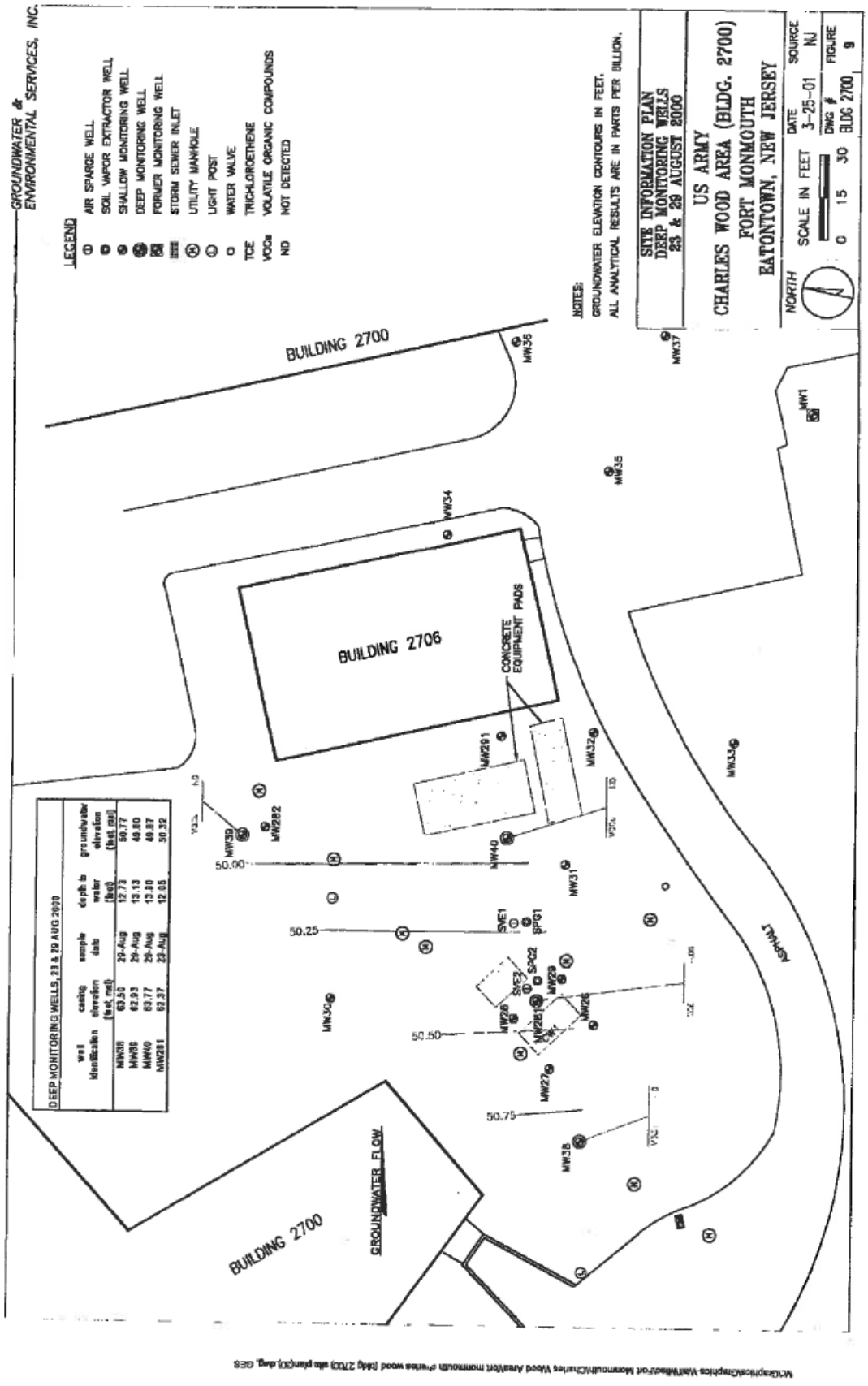
Table 2-2
Ambient Levels of Selected Metals and Other Analytes in Soil

Parameter	N	Detects	MDL (mg/kg)	Mean (mg/kg)	Median (mg/kg)	Minimum (mg/kg)	Maximum (mg/kg)	90th Percentile (mg/kg)	95th Percentile (mg/kg)	Geometric Mean (mg/kg)
Metals										
Aluminum	95	95	20	6734	6800	424	23100	10800	12300	5425
Antimony	95	0	6	NA	NA	NA	NA	NA	NA	NA
Arsenic	95	86	1	7.9	5.2	0.50	83.1	13.6	15.7	4.7
Barium	95	62	20	36.0	28.3	10.0	154	65.8	83.7	27.3
Beryllium	95	15	0.5	0.36	0.29	0.25	1.80	0.68	0.76	0.33
Cadmium	95	5	0.5	0.36	0.29	0.25	2.70	0.32	0.85	0.32
Calcium	95	61	500	1312	995	250	21600	2000	3810	797
Chromium	95	95	1	18.7	11.8	1.1	171	34.7	39.8	12.9
Cobalt	95	7	5	3.5	2.9	2.5	32.0	3.2	6.7	3.1
Copper	95	86	2.5	15.0	9.3	1.3	93.0	33.3	41.3	9.7
Iron	95	95	10	11909	8830	735	68900	21100	35700	8448
Lead	95	86	10	59.7	37.6	5	344	144	179	37.5
Magnesium	95	56	500	1056	673	250	13800	1870	2860	664
Manganese	94	94	1.5	111	62.4	2.6	1030	206	423	60.1
Mercury	95	40	0.1	0.18	0.06	0.05	6.10	0.21	0.33	0.09
Nickel	94	42	4	5.2	2.4	2.0	16.9	12.3	13.9	4.1
Potassium	94	45	500	1022	310	250	22300	1750	2090	568
Selenium	94	0	1	NA	NA	NA	NA	NA	NA	NA
Silver	94	3	1	0.68	0.6	0.50	6.30	0.65	0.65	0.61
Sodium	94	0	500	NA	NA	NA	NA	NA	NA	NA
Thallium	94	2	1	0.67	0.6	0.50	1.70	1.15	1.25	0.64
Vanadium	94	89	5	21.1	16	2.5	202	35.5	46.3	15.8
Zinc	94	91	2	53.4	39.9	1.0	259	106	157	36.4
PAHs										
Benzo(a)anthracene	94	54	0.029	0.14	0.04	0.01	1.82	0.43	0.57	0.04
Benzo(a)pyrene	94	48	0.037	0.14	0.02	0.01	1.8	0.42	0.67	0.04
Benzo(b)fluoranthene	94	49	0.04	0.35	0.19	0.05	4.09	0.66	1.24	0.23
Benzo(b+k)fluoranthene	95	47	0.08	0.35	0.19	0.05	4.1	0.66	1.2	0.23
Dibenzo(a,h)anthracene	94	9	0.037	0.03	0.01	0.01	0.29	0.02	0.13	0.01
Indeno(1,2,3-c,d)pyrene	94	33	0.018	0.07	0.01	0.01	0.57	0.23	0.37	0.02
Chrysene	94	53	0.022	0.15	0.05	0.01	1.78	0.47	0.7	0.05

Notes:
Source - BEM Systems, Inc., 1998
N = Number of samples
MDL = Method detection limit

APPENDIX C-2
HISTORICAL INFORMATION FOR FTMM-22


GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
LEGEND
AIR SPARGE WELL
SOIL VAPOR EXTRACTOR WELL
SHALLOW MONITORING WELL
DEEP MONITORING WELL
FORMER MONITORING WELL
STORM SEWER INLET
UTILITY MANHOLE
LIGHT POST
WATER VALVE
TCE TRICHLOROETHENE
VOCs VOLATILE ORGANIC COMPOUNDS
ND NOT DETECTED
Cis1,2-DCE Cis1,2-DICHLOROETHENE
ALSO REPORTED IN TRIP BLANK
NOTES:
GROUNDWATER ELEVATION CONTOURS IN FEET.
ALL ANALYTICAL RESULTS ARE IN PARTS PER BILLION.
SITE INFORMATION PLAN
SHALLOW MONITORING WELLS
23 & 29 AUGUST 2000
US ARMY
CHARLES WOOD AREA (BLDG. 2700)
FORT MONMOUTH
EATONTOWN, NEW JERSEY
NORTH
SCALE IN FEET
0 15 30
DATE 3-25-01
DWG # BLDG 2700
SOURCE NJ
FIGURE 8
BUILDING 2700
BUILDING 2706
CONCRETE EQUIPMENT PADS
GROUNDWATER FLOW
ASPHALT
MW1
MW25
MW26
MW27
MW28
MW29
MW30
MW31
MW32
MW33
MW34
MW35
MW36
MW37
MW39
MW40
MW281
MW282
SVE1
SPG1
SPG2
SHALLOW MONITORING WELLS, 23 & 29 AUG 2000



M:\Graphical\Graphics-Mxd\Maps\Fort Monmouth\Charles Wood Area\Ext Monmouth Charles wood (bldg 2700) site plan(3).dwg, GES

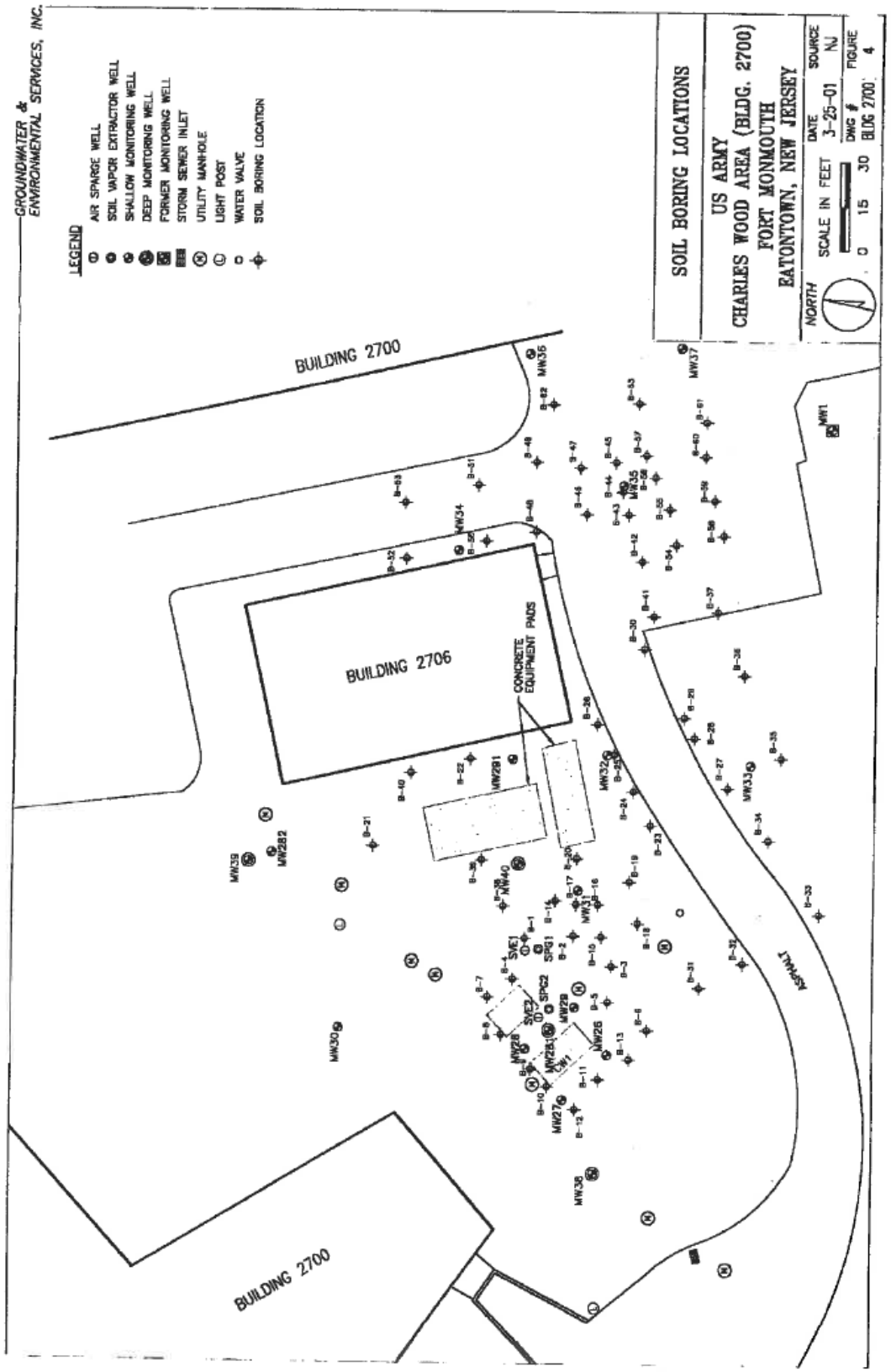

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
LEGEND
AIR SPARGE WELL
SOIL VAPOR EXTRACTOR WELL
SHALLOW MONITORING WELL
DEEP MONITORING WELL
FORMER MONITORING WELL
STORM SEWER INLET
UTILITY MANHOLE
LIGHT POST
WATER VALVE
SOIL BORING LOCATION
SOIL BORING LOCATIONS
US ARMY
CHARLES WOOD AREA (BLDG. 2700)
FORT MONMOUTH
EATONTOWN, NEW JERSEY
NORTH
SCALE IN FEET
0 15 30
DATE 3-25-01
SOURCE NJ
DWG # BLDG 2700
FIGURE 4
BUILDING 2700
BUILDING 2706
CONCRETE EQUIPMENT PADS
BUILDING 2700
ASPHALT
M:\Graphics\Graphics-Work\Misc\Fort Monmouth\Charles wood Aerial\fort monmouth charles wood (bldg 2700) site plan(3).dwg, GES

TABLE 1

SOIL SAMPLING RESULTS - DECEMBER 1994

WASTEWATER TREATMENT LIME PIT, CW-1
CHARLES WOOD AREA, FORT MONMOUTH, NEW JERSEY

Sample ID.			CW01-SB-26-A02	CW01-SB-27-A02	CW01-SB-28-A02	CW01-SB-29-A02
Sample Depth:			7-9	7-9	7-9 ft, bgs	7-9 ft
Sampling Date:			12/19/94	12/19/94	12/19/94	12/19/94
	Units	Criteria[1]				
VOLATILES						
Acetone	mg/kg	50	ND	ND	0.057 B	0.120 B
SEMI-VOLATILES						
di-n-butyl phthalate	mg/kg	100	0.081	0.086	0.077	0.13 JB
bis(2-ethylhexyl) phthalate	mg/kg	49	0.075	0.09	ND	ND
benzo(a)pyrene	mg/kg	0.66	ND	ND	ND	0.073
benzo(b)fluoranthene	mg/kg	0.9	ND	ND	ND	0.07 J
PESTICIDES/PCBs	mg/kg	ND	ND	ND	ND	ND

Notes:
ns: not specified
ND: not detected
1: IGW or RDC, whichever is more stringent
J: estimated concentration
Source: Roy F. Weston, Inc. *November 1995 Site Investigation Report*

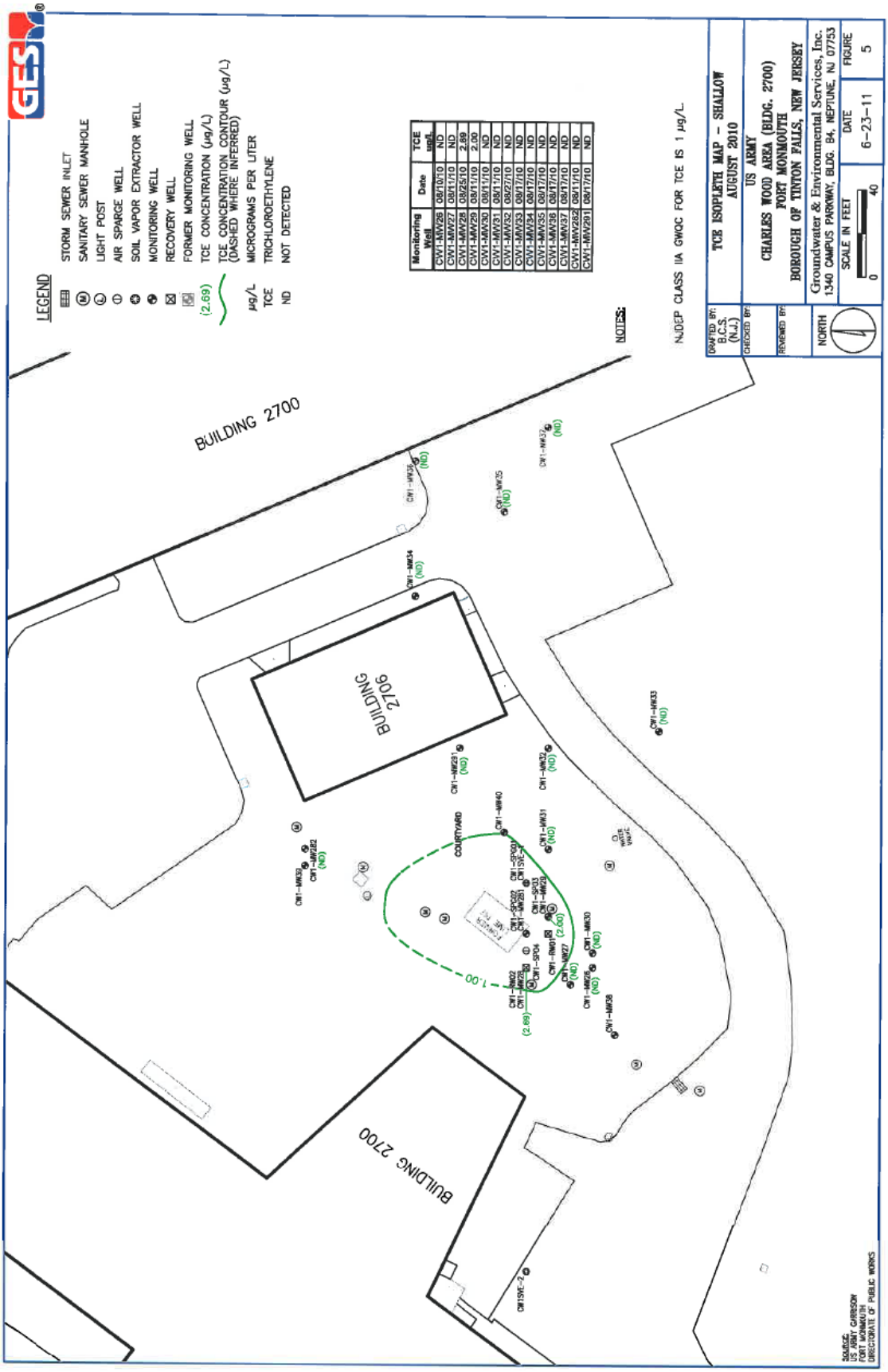
TABLE 3

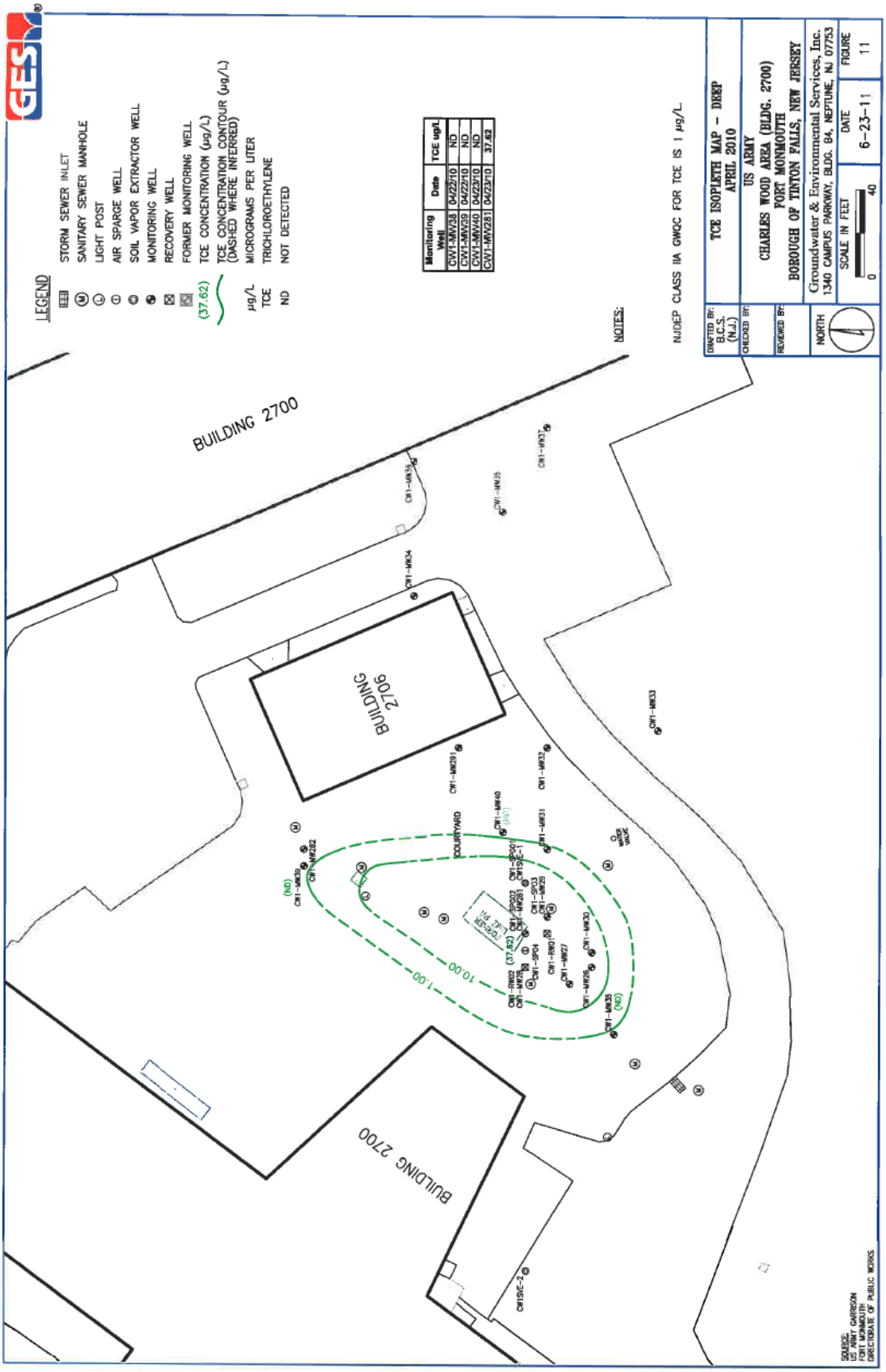
SOIL SAMPLING RESULTS - MAY 1996

WASTEWATER TREATMENT LIME PIT, CW-1
CHARLES WOOD AREA, FORT MONMOUTH, NEW JERSEY

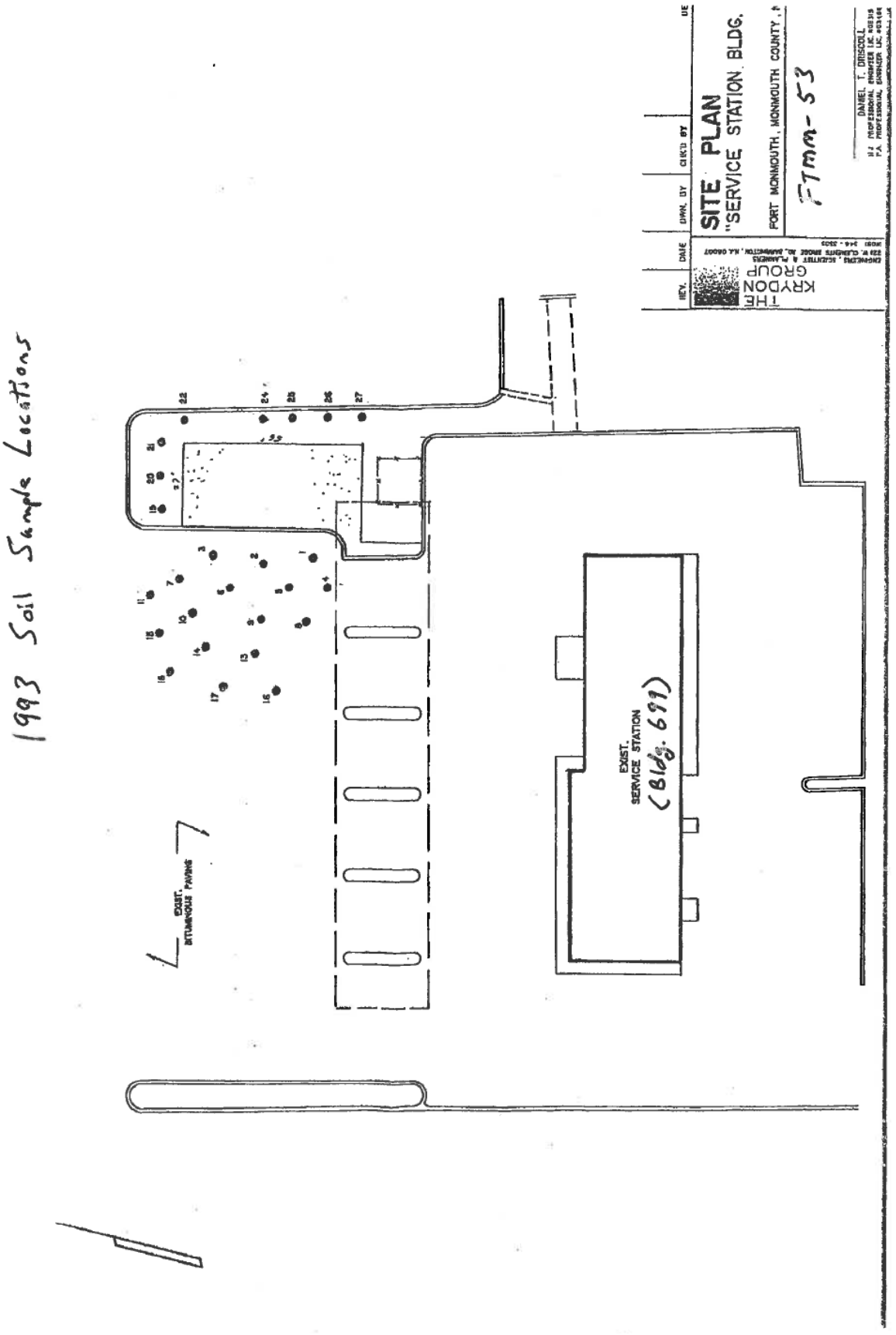
Sample ID:			CW01-SB281-A02	CW01-SB281-A03	CW01-SB282-A02	CW01-SB282-A03	CW01-SB291-A02	CW01-SB291-A03
Sampling Depth:			18.8-19.4	32.0-39.2	6.0-8.0	38.0-40.0	6.0-7.3	32.0-32.4
Sampling Date:			05/01/96	05/01/96	05/02/96	05/02/96	05/03/96	05/03/96
	Units	IGW						
Total Solids	%	ns	73.2	84.9	81.6	84.3	87.7	78.6
VOLATILES								
Acetone	mg/kg	50	2.4	0.012 J	ND	0.051	ND	8.6
Carbon disulfide	mg/kg	ns	50	ND	ND	ND	ND	ND
Chloroform	mg/kg	1	ND	ND	ND	0.015	ND	ND
Trichloroethene	mg/kg	1	7.8	ND	ND	ND	ND	ND
Toluene	mg/kg	1	0.020	ND	ND	ND	ND	ND
Tetrachloroethene	mg/kg	1	0.013	ND	ND	ND	ND	ND

otes:
s: not specified
D: not detected
W: Impact to Groundwater Soil Cleanup Criteria
oncentrations in bold type exceed their respective Impact to Groundwater Soil Cleanup Criteria.
ource: Roy F. Weston, Inc. *June 1996 Supplemental Site Investigation Report*


LEGEND
STORM SEWER INLET
SANITARY SEWER MANHOLE
LIGHT POST
AIR SPARGE WELL
SOIL VAPOR EXTRACTOR WELL
MONITORING WELL
RECOVERY WELL
FORMER MONITORING WELL
TCE CONCENTRATION CONTOUR (µg/L)
TCE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
µg/L MICROGRAMS PER LITER
TCE TRICHLOROETHYLENE
ND NOT DETECTED
Monitoring Well | Date | TCE ug/L
CW1-MW26 | 08/10/10 | ND
CW1-MW27 | 08/11/10 | ND
CW1-MW28 | 08/25/10 | 2.89
CW1-MW29 | 08/11/10 | 2.00
CW1-MW30 | 08/11/10 | ND
CW1-MW31 | 08/11/10 | ND
CW1-MW32 | 08/27/10 | ND
CW1-MW33 | 08/17/10 | ND
CW1-MW34 | 08/17/10 | ND
CW1-MW35 | 08/17/10 | ND
CW1-MW36 | 08/17/10 | ND
CW1-MW37 | 08/17/10 | ND
CW1-MW282 | 08/11/10 | ND
CW1-MW291 | 08/17/10 | ND
NOTES:
NJDEP CLASS IIA GWQC FOR TCE IS 1 µg/L
BUILDING 2700
BUILDING 2706
BUILDING 2700
COURTYARD
1.00
TCE ISOPLETH MAP - SHALLOW
AUGUST 2010
US ARMY
CHARLES WOOD AREA (BLDG. 2700)
FORT MONMOUTH
BOROUGH OF TINTON FALLS, NEW JERSEY
Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, BLDG. B4, NEPTUNE, NJ 07753
DRAFTED BY: B.C.S. (W.J.)
CHECKED BY:
REVIEWED BY:
NORTH
SCALE IN FEET
0
40
DATE
6-23-11
FIGURE
5
SOURCE:
US ARMY GARRISON
FORT MONMOUTH
DIRECTORATE OF PUBLIC WORKS


LEGEND
STORM SEWER INLET
SANITARY SEWER MANHOLE
LIGHT POST
AIR SPARGE WELL
SOIL VAPOR EXTRACTOR WELL
MONITORING WELL
RECOVERY WELL
FORMER MONITORING WELL
TCE CONCENTRATION (µg/L)
(37.62) TCE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
µg/L MICROGRAMS PER LITER
TCE TRICHLOROETHYLENE
ND NOT DETECTED
Monitoring Well | Date | TCE ug/L
CW1-MW38 | 04/22/10 | ND
CW1-MW39 | 04/22/10 | ND
CW1-MW40 | 04/23/10 | ND
CW1-MW28I | 04/23/10 | 37.62
NOTES:
NJDEP CLASS IIA GWQC FOR TCE IS 1 µg/L.
TCE ISOPLETH MAP - DEEP
APRIL 2010
US ARMY
CHARLES WOOD AREA (BLDG. 2700)
FORT MONMOUTH
BOROUGH OF TINTON FALLS, NEW JERSEY
Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, BLDG. B4, NEPTUNE, NJ 07753
DRAFTED BY: B.C.S. (N.J.)
CHECKED BY:
REVIEWED BY:
NORTH
SCALE IN FEET
0 40
DATE 6-23-11
FIGURE 11
BUILDING 2700
BUILDING 2706
COURTYARD
10.00
1.00
SOURCE:
US ARMY GARRISON
FORT MONMOUTH
DIRECTORATE OF PUBLIC WORKS

APPENDIX C-3
HISTORICAL INFORMATION FOR FTMM-53


1993 Soil Sample Locations
SITE PLAN
"SERVICE STATION BLDG.
FORT MONMOUTH, MONMOUTH COUNTY
FTMM-53
THE KRYDON GROUP
EXIST. SERVICE STATION (Bldg. 691)
EXIST. BITUMINOUS PAVING

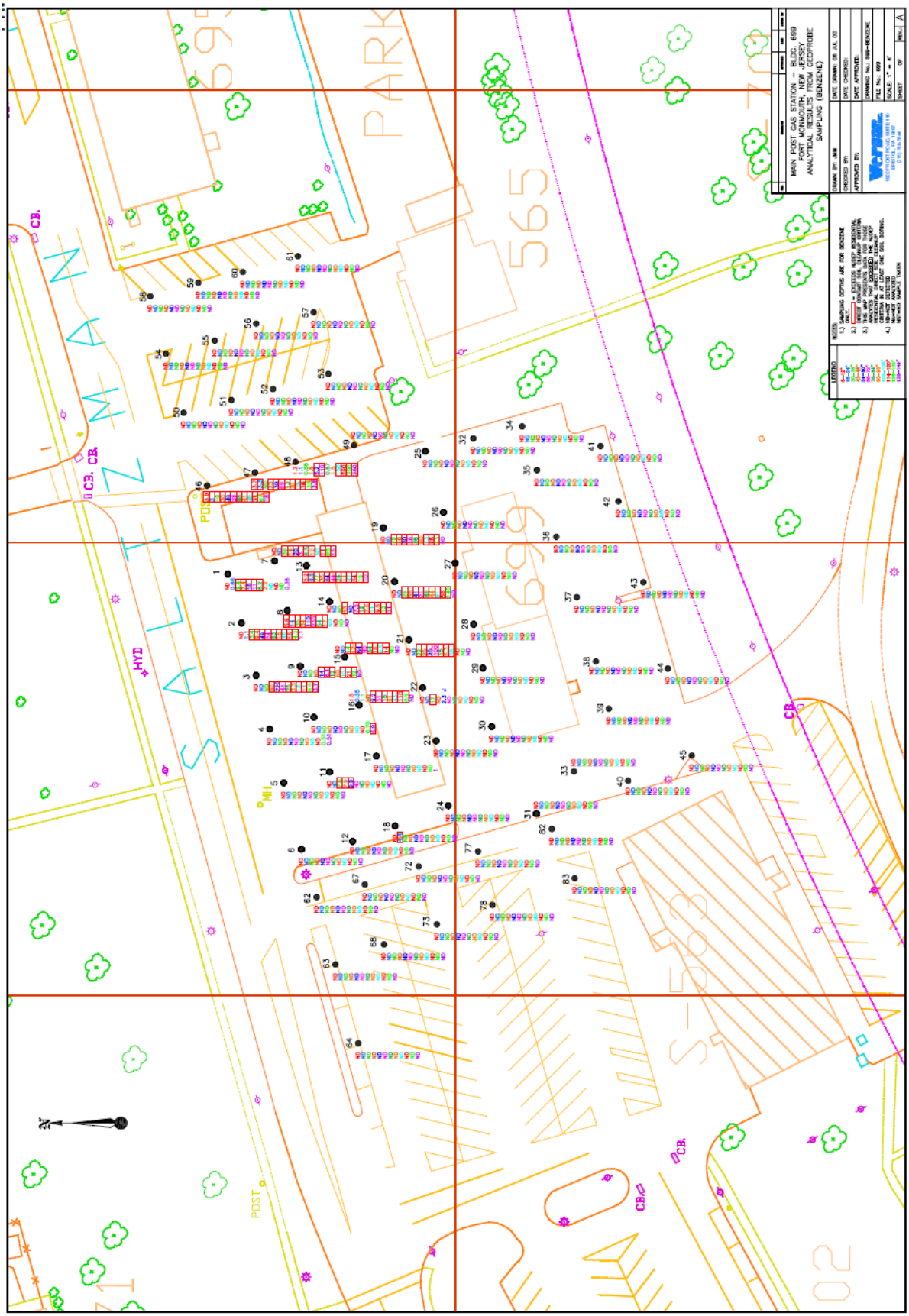
10/11/93
93018RAWP/FTMON

TABLE 3
Soil Analysis Summary Data – FTmm-53
May 30, 1993

SAMPLE	BENZENE	TOLUENE	XYLENES	ETHYLBENZENE	LEAD	TICs	VOCs*
3701	14	200	500	100	ND	814	1451
3702	5.3	77	292	33	8.89	347.3	675
3703	~10	16	470	63	ND	693	1331
3704	~.73	37	142	28	9.58	287	743.2
3705	9	98	233	36	8.79	376	590
3706	ND	40	147.9	22	9.40	209	442.8
3707	22	220	510	68	8.54	820	1465
3708	~12	140	349	54	12.0	543	980
3709	~5.8	60	139	20	11.4	219	364.3
3710	54	470	900	140	ND	1584	2481
3711	32	300	570	90	9.06	992	1892
3712	ND	100	314	50	12.5	464	912
3713	ND	110	326	51	16.6	487	968
3714	ND	92	287	43	9.2	422	870
3715	~9.3	180	470	78	8.79	728	1288
3716	ND	59	199	32	6.60	290	577.6
3717	ND	51	200	29	8.33	280	657
3718	90	680	1200	200	9.30	2170	2877
3719	20	230	500	77	6.12	827	1242
3720	~3.7	66	184	27	17.9	279	516
3721	ND	71	257	36	ND	364	714
3722	~9.4	200	540	80	17.2	820	1277
3723	60	530	1000	160	11.2	1354	2137
3724	ND	26	130	18	ND	174	493
3725	ND	25	85	15	ND	125	300.7
3726	ND	ND	ND	ND	ND	ND	ND
3727	ND	ND	ND	ND	ND	ND	ND

Results reported in milligrams per kilogram; mg/kg.

* -Does not include J and B compounds.


MAIN POST GAS STATION - BLDG. 699
FORT MONMOUTH, NEW JERSEY
ANALYTICAL RESULTS FROM GEOPROBE
SAMPLING (BENZENE)
NOTES
LEGEND
NORTH
HYD
CB.
POST
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PARK
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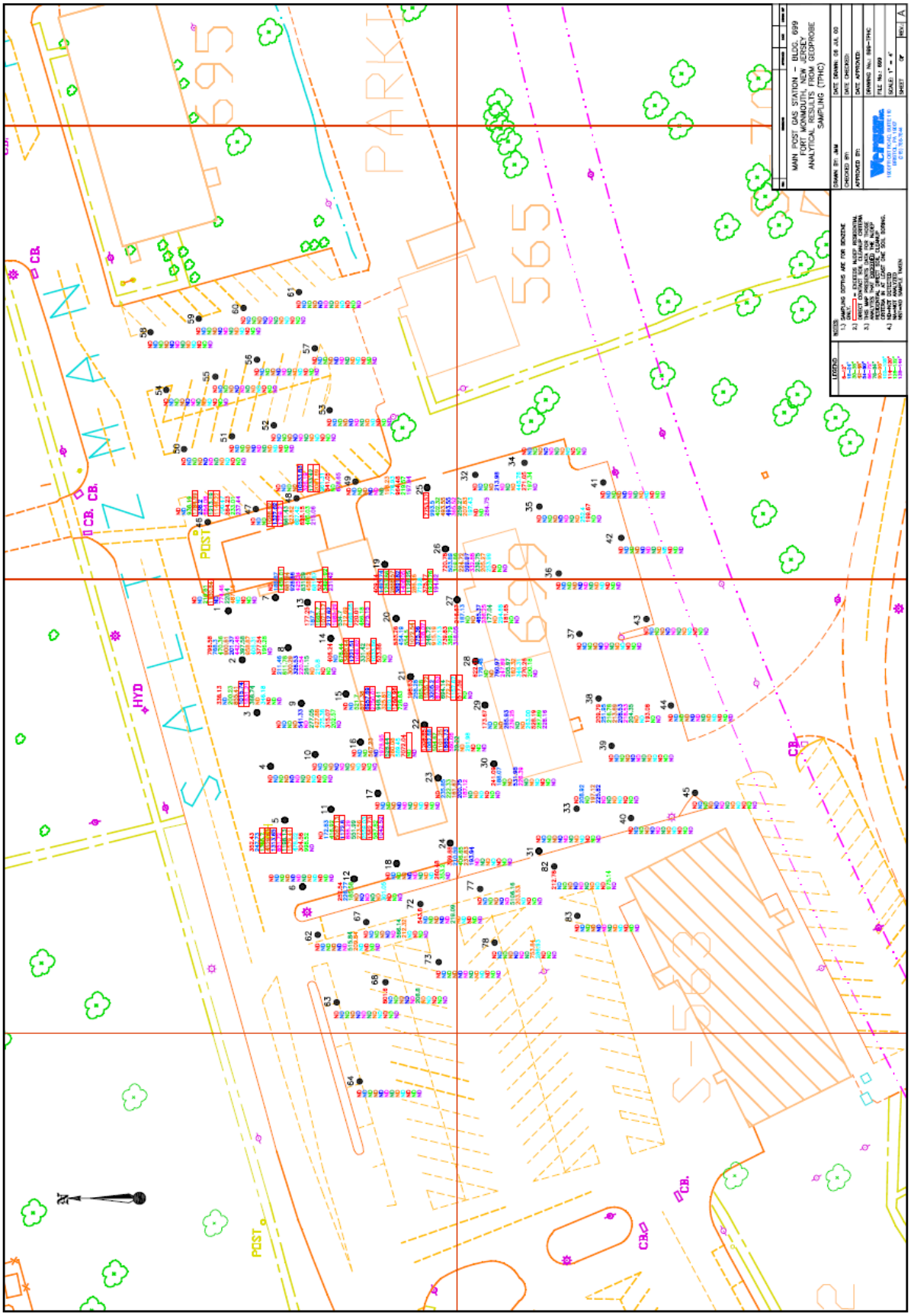
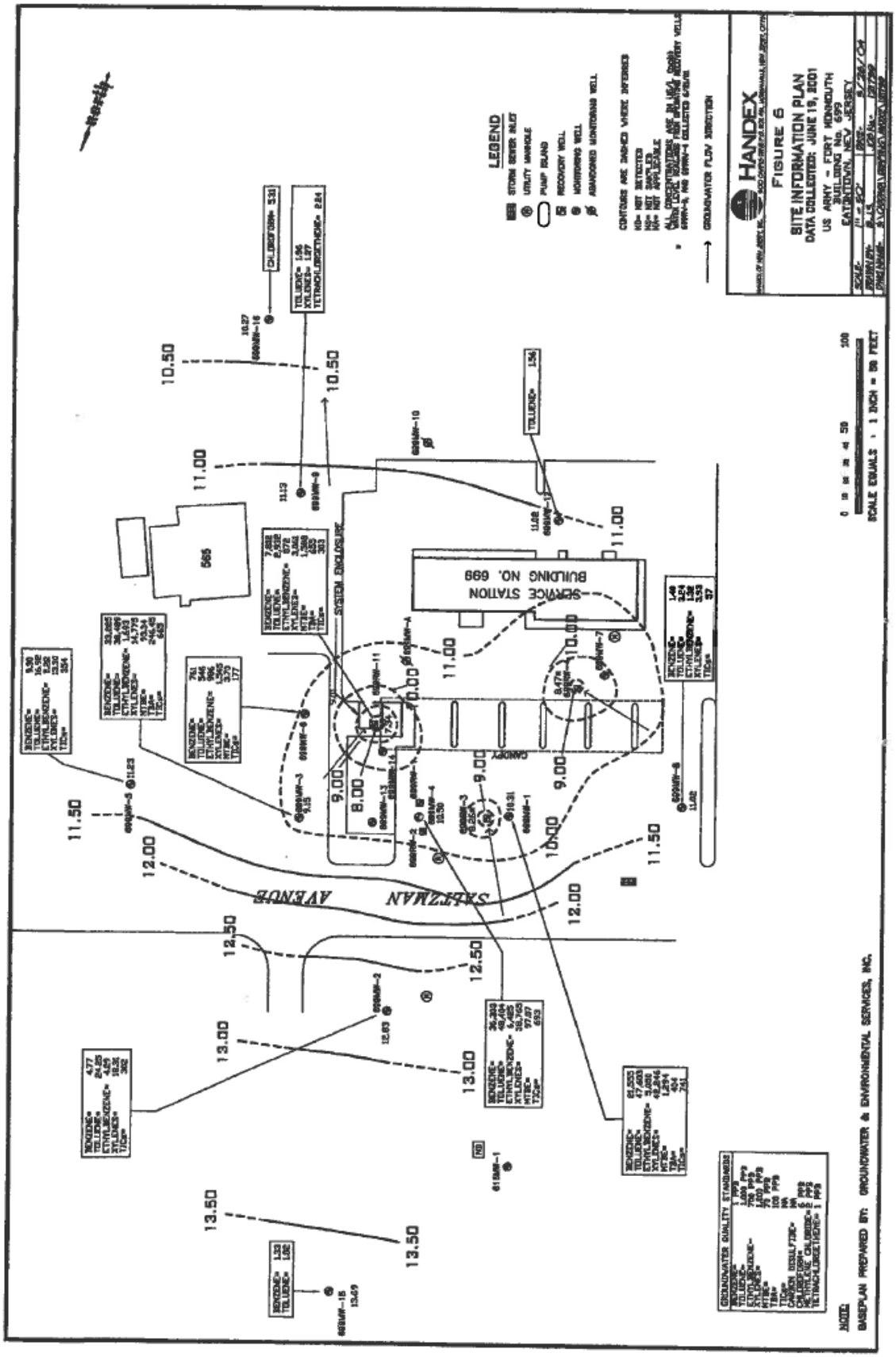
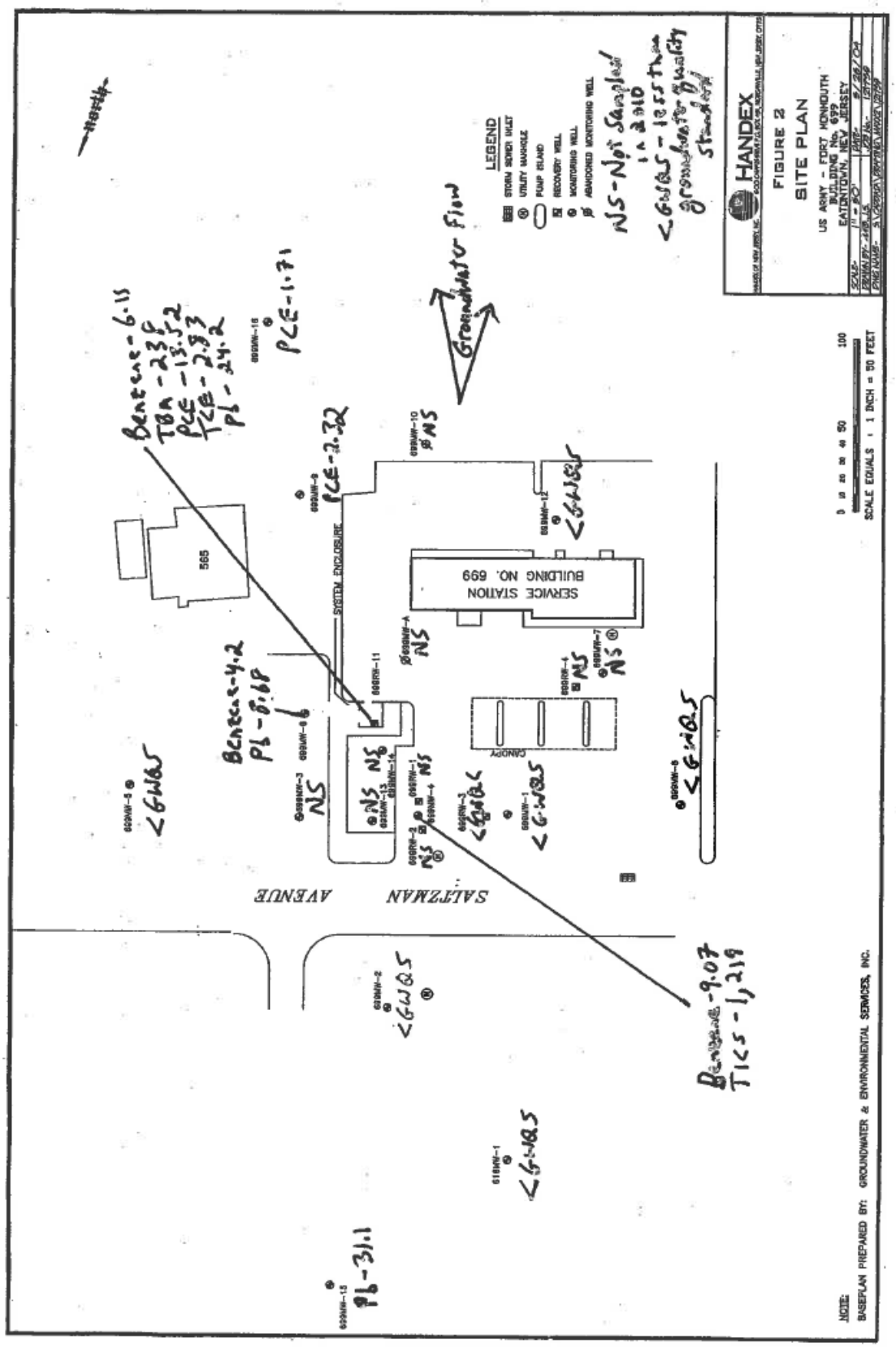
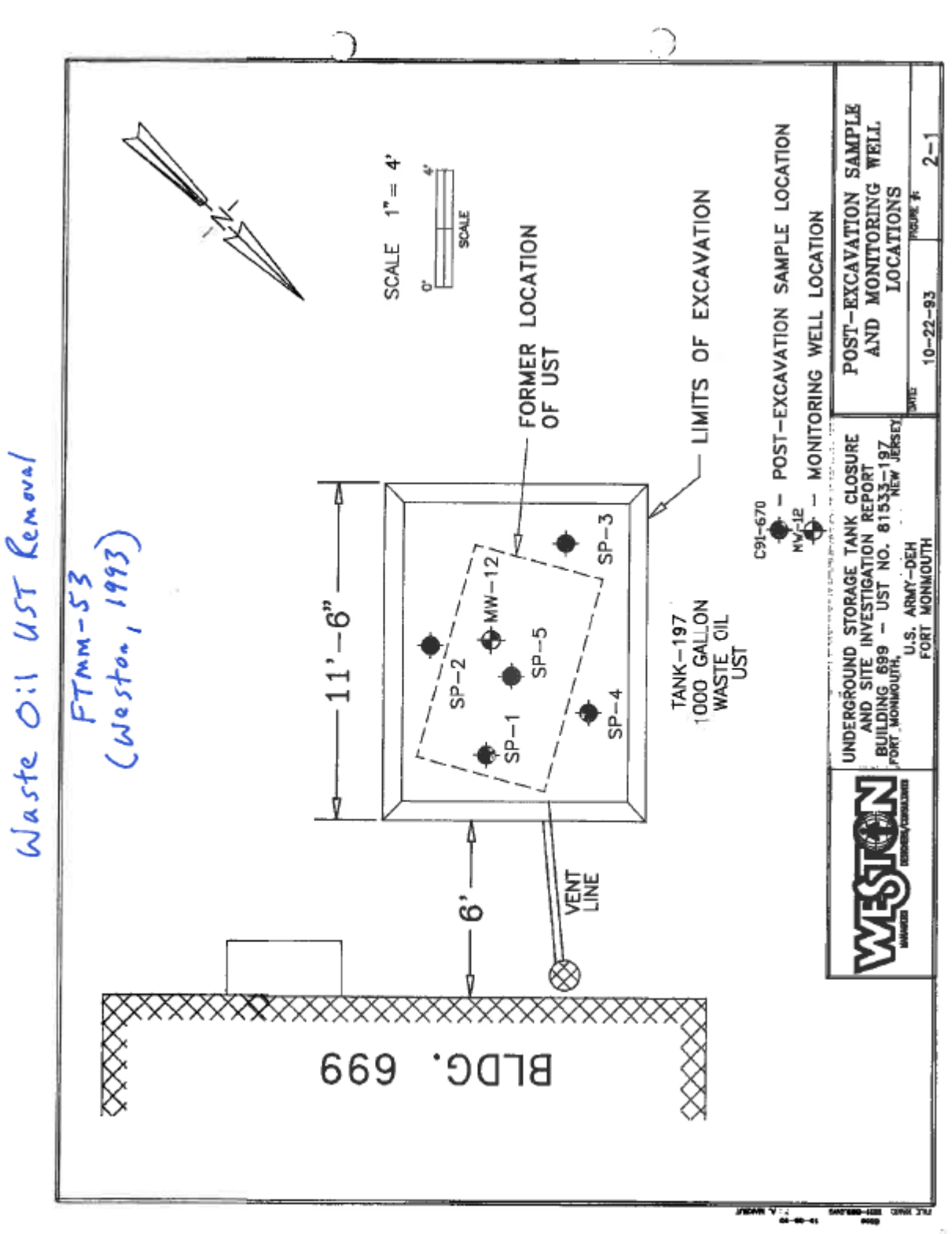

MAIN POST GAS STATION - BLDG. 699
FORT MONMOUTH, NEW JERSEY
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (TPHC)
LEGEND
NOTES
PARKING
CB.
POST
HYD


LEGEND
STORM SEWER INLET
UTILITY MANHOLE
PUMP ISLAND
RECOVERY WELL
MONITORING WELL
ABANDONED MONITORING WELL
GROUNDWATER FLOW DIRECTION
HANDEX
FIGURE 6
SITE INFORMATION PLAN
DATA COLLECTED: JUNE 19, 2001
US ARMY - FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY
SERVICE STATION
BUILDING NO. 699
565
SALTZMAN AVENUE
CANOPY
SCALE EQUALS 1 INCH = 50 FEET
BASEPLAN PREPARED BY: GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
NOTE:


LEGEND
STORM SEWER INLET
UTILITY MANHOLE
PUMP ISLAND
RECOVERY WELL
MONITORING WELL
ABANDONED MONITORING WELL
HANDEX
FIGURE 2
SITE PLAN
US ARMY - FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY
SERVICE STATION
BUILDING NO. 699
565
SYSTEM ENCLOSURE
CANOPY
SALTZMAN AVENUE
SCALE EQUALS 1 INCH = 50 FEET
NOTE:
BASEPLAN PREPARED BY: GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
Benzene-6.15
TBA-2.36
PCE-13.52
TCE-2.93
PI-24.2
PCE-1.71
Groundwater flow
NS-Not Sampled in 2010
GWQS-Groundwater Quality Standard
GWQS Exceedances in 2010
FTMM-53
Benzene-4.2
PI-8.18
PCE-2.32
Benzene-9.07
TICs-1,219
PI-31.1


Waste Oil UST Removal
FTMM-53
(Weston, 1993)
SCALE 1" = 4'
SCALE
FORMER LOCATION OF UST
LIMITS OF EXCAVATION
11'-6"
6'
VENT LINE
BLDG. 699
TANK-197
1000 GALLON
WASTE OIL
UST
SP-1
SP-2
SP-3
SP-4
SP-5
MW-12
C91-670
MW-12
– POST-EXCAVATION SAMPLE LOCATION
– MONITORING WELL LOCATION
POST-EXCAVATION SAMPLE AND MONITORING WELL LOCATIONS
10-22-93
2-1
UNDERGROUND STORAGE TANK CLOSURE
AND SITE INVESTIGATION REPORT
BUILDING 699 – UST NO. 81533-197
FORT MONMOUTH, NEW JERSEY
U.S. ARMY-DEH
FORT MONMOUTH
WESTON

WESTON

WASTE OIL UST
FTMM-53

TABLE 3-1

SUMMARY OF ANALYTICAL RESULTS
POST-EXCAVATION SOIL SAMPLES
UST REGISTRATION NO. 81533-197
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

SAMPLE ID NO.		SP1	SP2	SP3	SP4	SP5	PROPOSED NJDEPE SUBSURFACE CLEANUP CRITERIA
LABORATORY ID NO.		7030.6	7030.7	7030.8	7030.9	7030.10	
MATRIX		SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE TYPE		FE	FS	FS	FS	FS	
SAMPLE COLLECTION DATE		1/6/92	1/6/92	1/6/92	1/6/92	1/6/92	
ANALYTICAL PARAMETER	UNITS						mg/kg
TPHC	mg/kg	6090	11600	2800	ND	15	NC*
BASE NEUTRAL COMPOUNDS	mg/kg						
2-CHLOROPHENOL		0.64J	0.57J	ND	ND	ND	50
4-CHLORO-3-METHYL PHENOL		0.59J	0.84J	ND	ND	ND	100
DI-N-BUTYLPHTHALATE		0.95JB	1.2JB	ND	0.88JB	0.054JB	100
PYRENE		0.62J	0.79J	1.3J	ND	ND	500
BIS(2-ETHYLHEXYL)PHTHALATE		2.6JB	2.3JB	2.9JB	0.24JB	0.23JB	100
2-METHYNAPHTHALENE		ND	0.81J	4.5	ND	ND	NC
ACENAPHTHENE		ND	0.38J	ND	ND	ND	100

n:\FORTMONM\Task 669

3-2

WESTON

TABLE 3-1

SUMMARY OF ANALYTICAL RESULTS (CONTINUED)
POST-EXCAVATION SOIL SAMPLES
UST REGISTRATION NO. 81533-197
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

SAMPLE ID NO.		SP1	SE2	SP3	SP4	SP5	PROPOSED NJDEPE SUBSURFACE CLEANUP CRITERIA
LABORATORY ID NO.		7030.6	7030.7	7030.8	7030.9	7030.10	
MATRIX		SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE TYPE		FS	FS	FS	FS	FS	
SAMPLE COLLECTION DATE		1/6/92	1/6/92	1/6/92	1/6/92	1/6/92	
ANALYTICAL PARAMETER	UNITS						mg/kg
BASE NEUTRAL COMPOUNDS	mg/kg						
PHENANTHRENE		ND	0.21J	0.84J	ND	ND	NC
NAPHTHALENE		ND	ND	1.7J	ND	ND	100
FLUORENE		ND	ND	0.38J	ND	ND	100
FLUORANTHENE		ND	ND	ND	ND	0.16J	500
VOLATILE ORGANIC COMPOUNDS	mg/kg						
METHYLENE CHLORIDE		0.094	0.068	0.14	0.13	0.13	10
1,1,2-TRICHLOROETHANE		0.13	0.11	0.17	0.12	0.15	50
M & P XYLENES		ND	0.023J	ND	ND	ND	NC
PHENOLS	mg/kg	ND	21.0	ND	ND	ND	NC

m:\FORTMONMM\Task.699

3-3

WESTON

TABLE 3-1

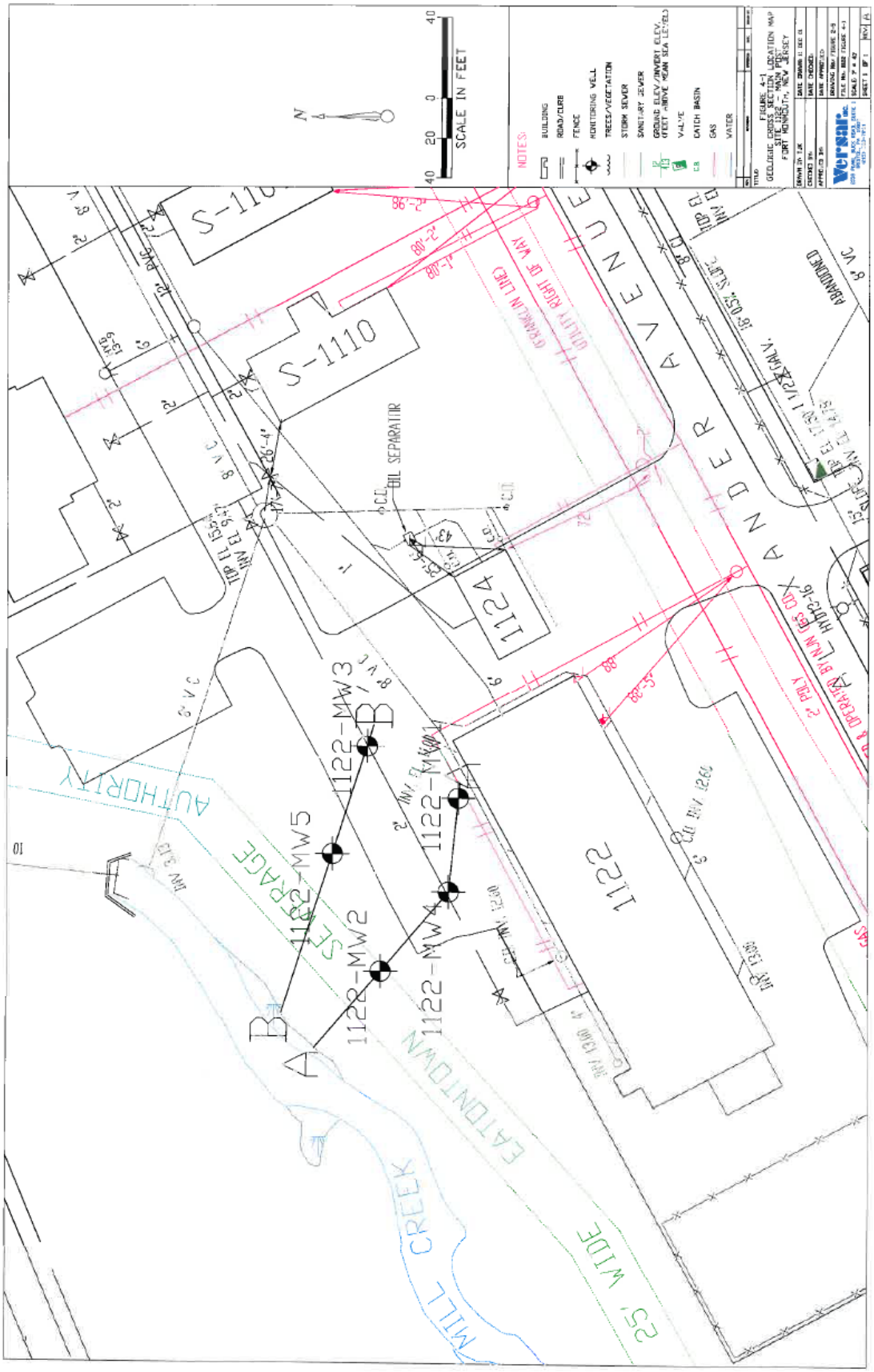
SUMMARY OF ANALYTICAL RESULTS (CONTINUED)
POST-EXCAVATION SOIL SAMPLES
UST REGISTRATION NO. 81533-197
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

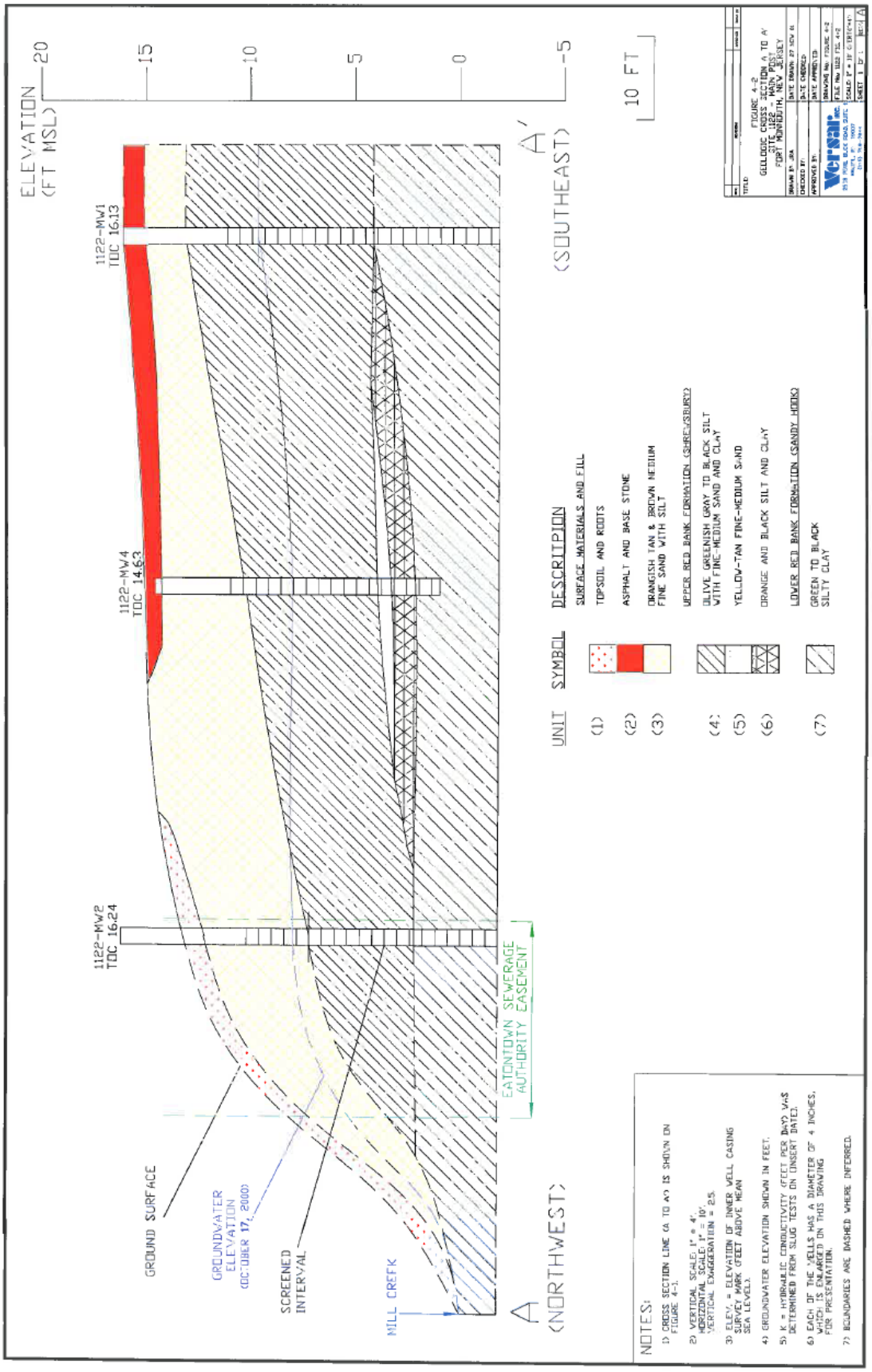
SAMPLE ID NO.		SP1	SP2	SP3	SP4	SP5	PROPOSED NJDEPE SUBSURFACE CLEANUP CRITERIA
LABORATORY ID NO.		7030-6	7030.7	7030.8	7030.9	7030.10	
MATRIX		SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE TYPE		FS	FS	FS	FS	FS	
SAMPLE COLLECTION DATE		1/6/92	1/6/92	1/6/92	1/6/92	1/6/92	
ANALYTICAL PARAMETER	UNITS						mg/kg
PRIORITY POLLUTANT METALS	mg/kg						
ANTIMONY		ND	ND	ND	ND	ND	NC
ARSENIC		ND	2.3	ND	ND	ND	NC
BERYLLIUM		0.187	0.423	0.108	0.190	0.310	NC
CADMIUM		0.01	0.02	0.04	0.02	0.04	NC
CHROMIUM		21.7	32.7	NC	16.7	27.4	
COPPER		6.0	8.3	7.6	4.6	7.7	NC
LEAD		12.0	332.7	18.4	4.6	9.5	NC
ZINC		15.1	62.5	18.4	14.4	30.4	NC

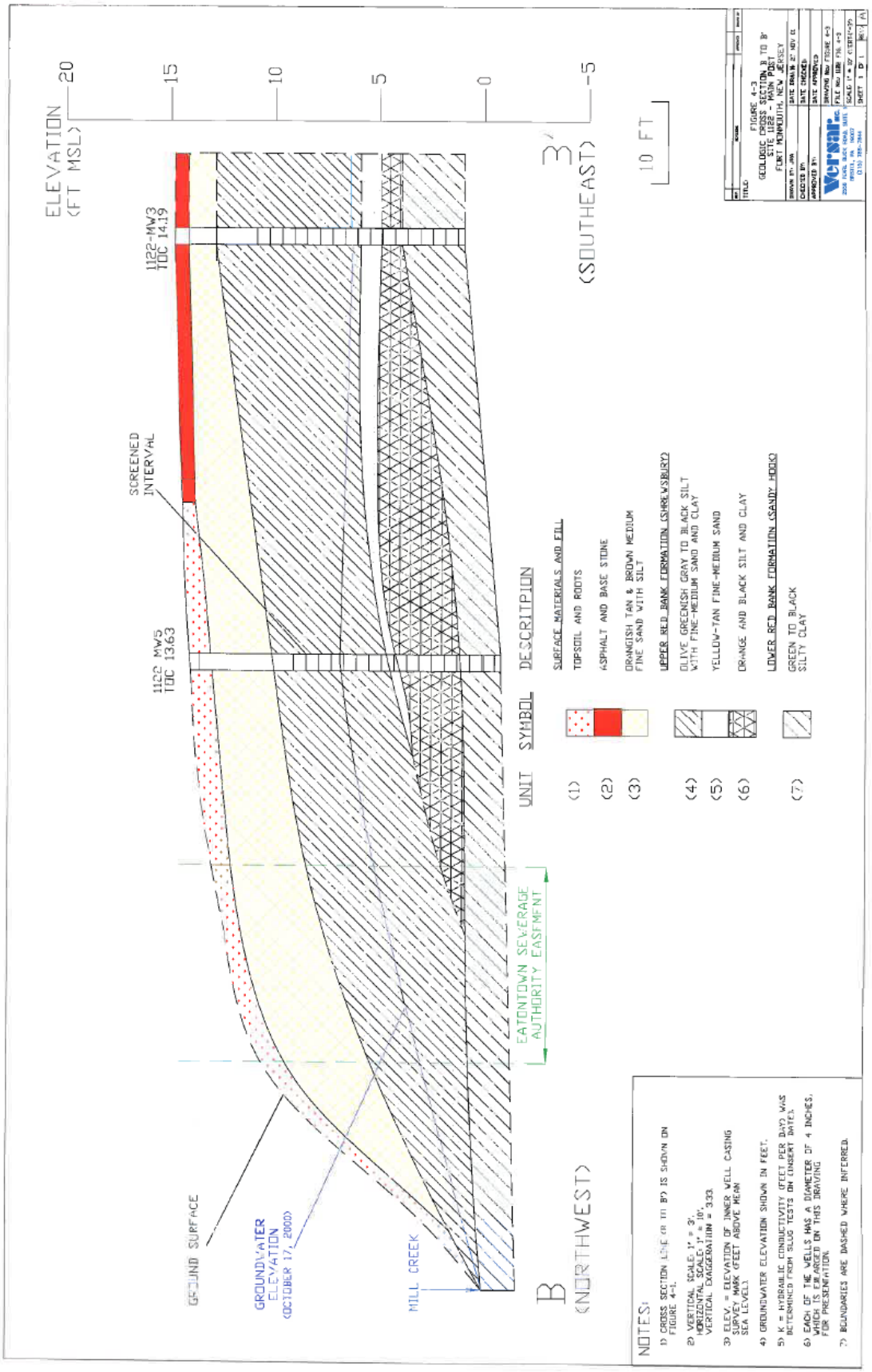
3-4

m:\FORTMONMO\Task 699

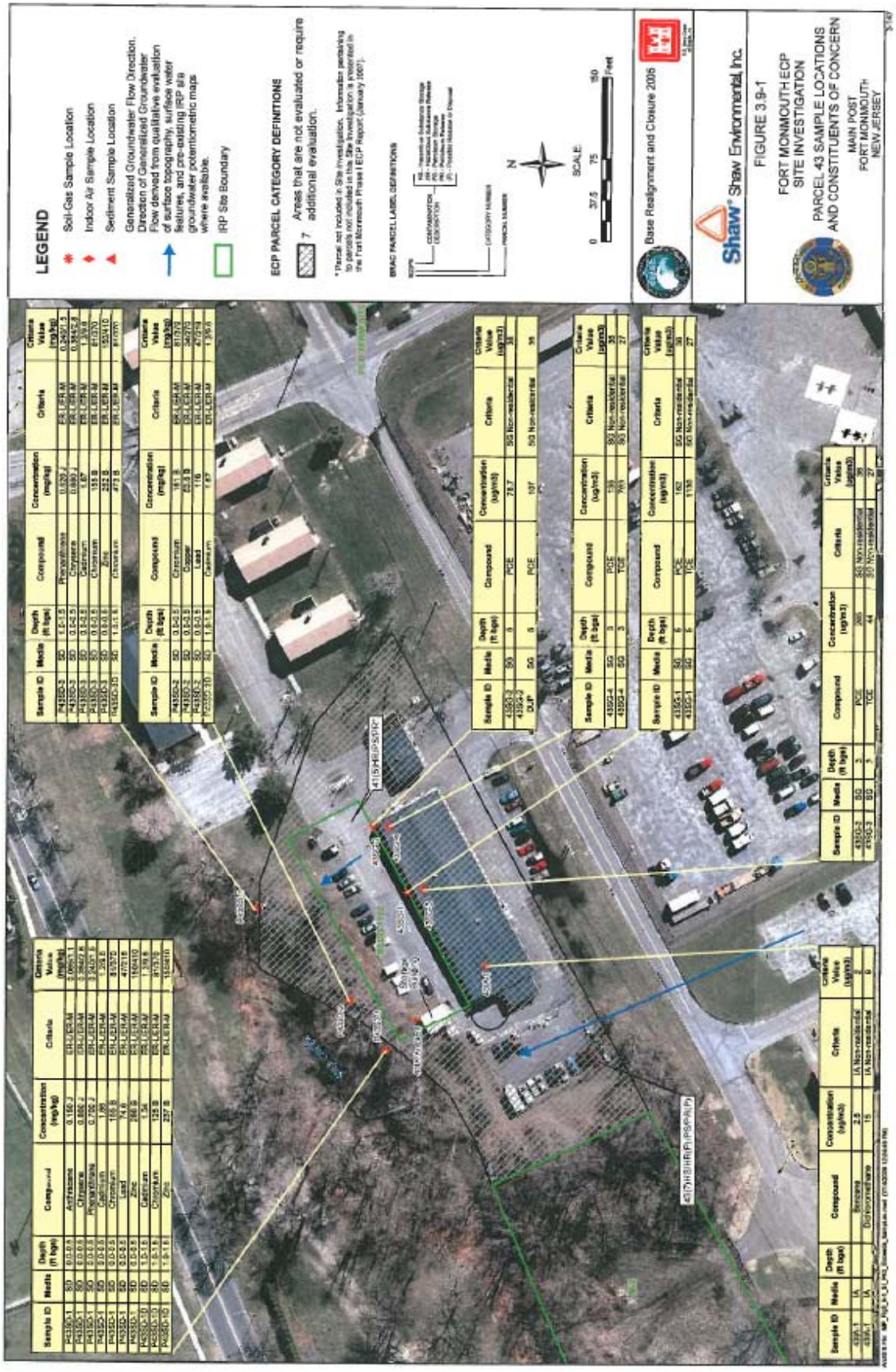
APPENDIX C-4
HISTORICAL INFORMATION FOR FTMM-59

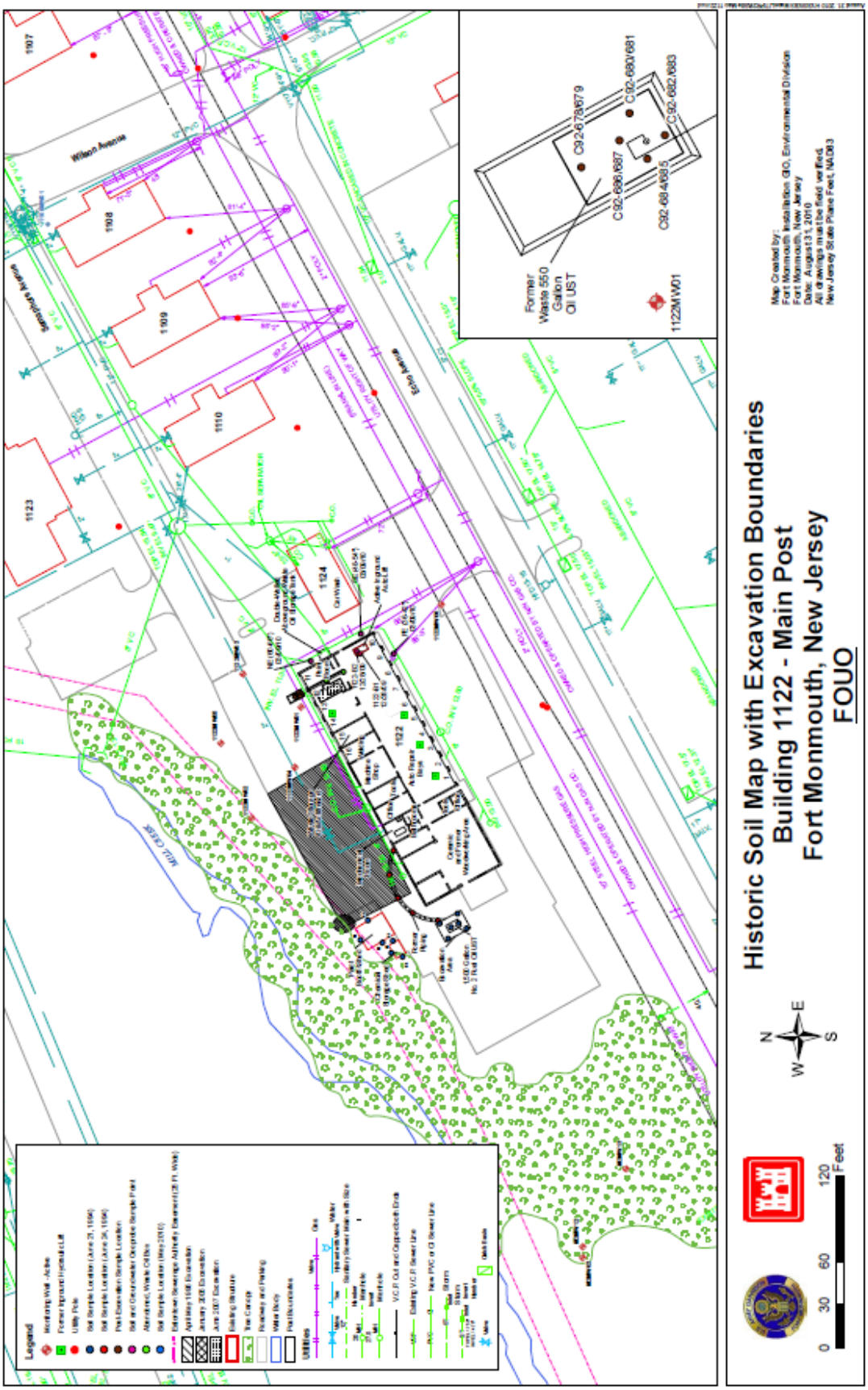

SCALE IN FEET
NOTES:
BUILDING
ROAD/CURB
FENCE
MONITORING WELL
TREES/VEGETATION
STORM SEWER
SANITARY SEWER
VALVE
CATCH BASIN
GAS
WATER
S-1110
1124
1122
1122-MW1
1122-MW2
1122-MW3
1122-MW4
1122-MW5
OIL SEPARATOR
ABANDONED
AUTHORITY
SEEPAGE
EATONTOWN
MILL CREEK
52' WIDE

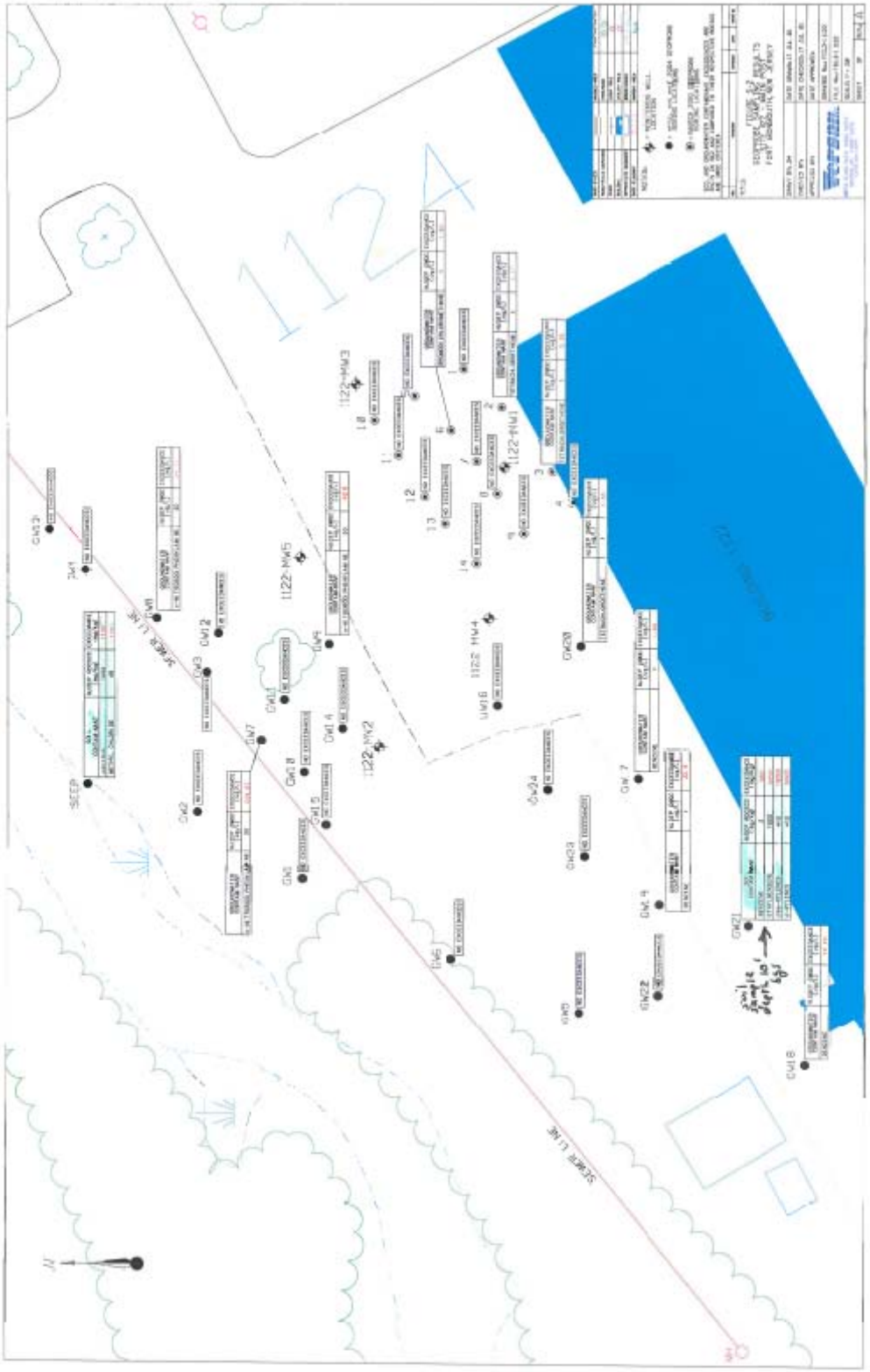

ELEVATION (FT MSL)
20
15
10
5
0
-5
A
(NORTHWEST)
A'
(SOUTHEAST)
10 FT
1122-MW1 TOC 16.13
1122-MW4 TOC 14.63
1122-MW2 TOC 16.24
GROUND SURFACE
GROUNDWATER ELEVATION (OCTOBER 17, 2000)
SCREENED INTERVAL
MILL CREEK
EATONTOWN SEWERAGE AUTHORITY EASEMENT
UNIT
SYMBOL
DESCRIPTION
(1) SURFACE MATERIALS AND FILL
TOPSOIL AND ROOTS
ASPHALT AND BASE STONE
(2)
(3) ORANGISH TAN & BROWN MEDIUM FINE SAND WITH SILT
UPPER RED BANK FORMATION (SHREWSBURY)
(4) OLIVE GREENISH GRAY TO BLACK SILT WITH FINE-MEDIUM SAND AND CLAY
(5) YELLOW-TAN FINE-MEDIUM SAND
(6) ORANGE AND BLACK SILT AND CLAY
LOWER RED BANK FORMATION (SANDY HOOK)
(7) GREEN TO BLACK SILTY CLAY
NOTES:
1) CROSS SECTION LINE (A TO A') IS SHOWN ON FIGURE 4-1.
2) VERTICAL SCALE: 1" = 4'. HORIZONTAL SCALE: 1" = 10'. VERTICAL EXAGGERATION = 2.5.
3) ELEV. = ELEVATION OF INNER WELL CASING SURVEY MARK (FEET ABOVE MEAN SEA LEVEL).
4) GROUNDWATER ELEVATION SHOWN IN FEET.
5) K = HYDRAULIC CONDUCTIVITY (FEET PER DAY) WAS DETERMINED FROM SLUG TESTS ON (INSERT DATE).
6) EACH OF THE WELLS HAS A DIAMETER OF 4 INCHES, WHICH IS ENLARGED ON THIS DRAWING FOR PRESENTATION.
7) BOUNDARIES ARE DASHED WHERE INFERRED.
FIGURE 4-2
GEOLOGIC CROSS SECTION A TO A'
FORT MONMOUTH, NEW JERSEY
Versar, Inc.

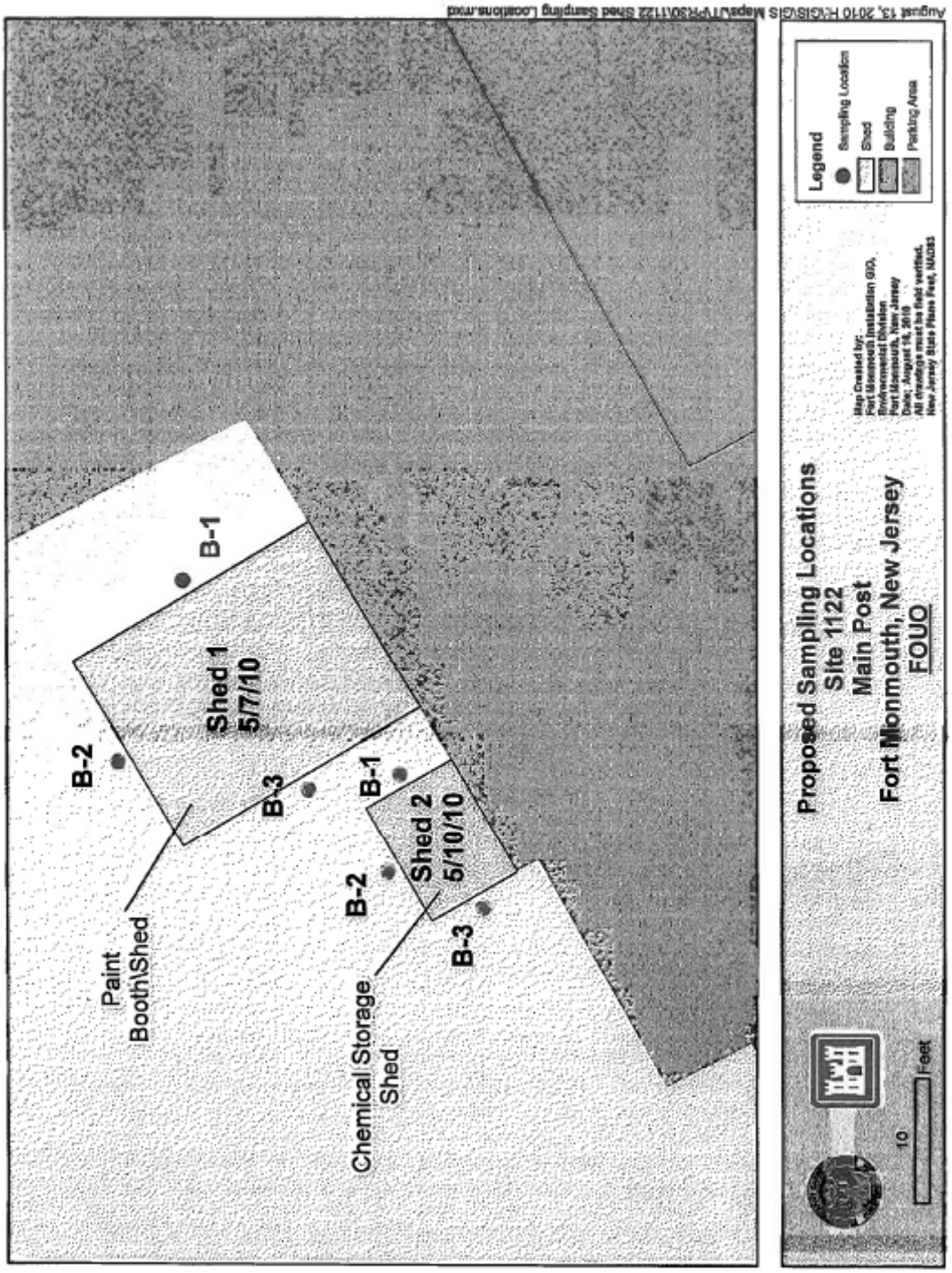

ELEVATION (FT MSL)
20
15
10
5
0
-5
10 FT
3'
B
(NORTHWEST)
B'
(SOUTHEAST)
1122-MW3
TOC 14.19
1122-MW5
TOC 13.63
SCREENED INTERVAL
GROUNDWATER ELEVATION (OCTOBER 17, 2000)
GROUND SURFACE
MILL CREEK
EATONTOWN SEWERAGE AUTHORITY EASEMENT
UNIT
SYMBOL
DESCRIPTION
(1) SURFACE MATERIALS AND FILL
TOPSOIL AND ROOTS
ASPHALT AND BASE STONE
(2) ORANGISH TAN & BROWN MEDIUM FINE SAND WITH SILT
(3) UPPER RED BANK FORMATION (SHREWSBURY)
(4) OLIVE GREENISH GRAY TO BLACK SILT WITH FINE-MEDIUM SAND AND CLAY
(5) YELLOW-TAN FINE-MEDIUM SAND
(6) ORANGE AND BLACK SILT AND CLAY
LOWER RED BANK FORMATION (SANDY HOOK)
(7) GREEN TO BLACK SILTY CLAY
NOTES:
1) CROSS SECTION LINE OF (B TO B') IS SHOWN ON FIGURE 4-1.
2) VERTICAL SCALE, 1" = 3'.
HORIZONTAL SCALE, 1" = 10'.
VERTICAL EXAGGERATION = 3.33.
3) ELEV. = ELEVATION OF INNER WELL CASING SURVEY MARK (FEET ABOVE MEAN SEA LEVEL).
4) GROUNDWATER ELEVATION SHOWN IN FEET.
5) K = HYDRAULIC CONDUCTIVITY (FEET PER DAY) WAS DETERMINED FROM SLUG TESTS ON (INDICATE DATES).
6) EACH OF THE WELLS HAS A DIAMETER OF 4 INCHES, WHICH IS ENLARGED ON THIS DRAWING FOR PRESENTATION.
7) BOUNDARIES ARE DASHED WHERE INFERRED.
FIGURE 4-3
GEOLOGIC CROSS SECTION B TO B'
SITE 1122 MAIN POST
FORT MONMOUTH, NEW JERSEY
Versar


S-1109
S-1110
1123
1124
1121
1122
ALEXANDER AVENUE
1122-MW1
1122-MW2
1122-MW3
1122-MW4
1122-MW5
MILL CREEK
NOTES:
GROUNDWATER ELEVATION CONTOUR
CONTOUR INTERVAL IS 1 FEET
GROUNDWATER FLOW DIRECTION
FIGURE 4-4b
GROUNDWATER CONTOUR MAP (SEPT 00)
SITE 1122 - MAIN POST
FORT MONMOUTH, NEW JERSEY


LEGEND
Soil-Gas Sample Location
Indoor Air Sample Location
Sediment Sample Location
Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
IRP Site Boundary
ECP PARCEL CATEGORY DEFINITIONS
Areas that are not evaluated or require additional evaluation.
BRAC PARCEL LABEL DEFINITIONS
SCALE
0 37.5 75 150 Feet
N
Base Realignment and Closure 2005
Shaw Shaw Environmental, Inc.
FIGURE 3.9-1
FORT MONMOUTH ECP
SITE INVESTIGATION
PARCEL 43 SAMPLE LOCATIONS
AND CONSTITUENTS OF CONCERN
MAIN POST
FORT MONMOUTH
NEW JERSEY


Historic Soil Map with Excavation Boundaries
Building 1122 - Main Post
Fort Monmouth, New Jersey
FOUO
Former Waste 550 Gallon Oil UST
C92-678/679
C92-680/681
C92-682/683
C92-684/685
C92-686/687
1122MW01
Legend
Wilson Avenue
Sherrill Drive
Gibbs Avenue
Hope Road
Arctic Circle
0 30 60 120 Feet




August 13, 2010 H:\GIS\GIS Maps\JT\R30\1122 Shed Sampling Locations.mxd
B-1
Shed 1
5/7/10
B-2
B-3
B-1
Shed 2
5/10/10
B-2
B-3
Paint
Booth\Shed
Chemical Storage
Shed
Legend
Sampling Location
Shed
Building
Parking Area
Proposed Sampling Locations
Site 1122
Main Post
Fort Monmouth, New Jersey
FOUO
10
Feet

Building 1122
Soil Boring Investigation
Paint Booth Shed 1
May 7, 2010

Constituent	NJDEP Residential Soil Remediation Standards	Shed1/B1 0-6"	Shed1/B1 66-72"	Shed1/B2 0-6"	Shed1/B2 84-90"	Shed1/B3 0-6"	Shed1/B3 60-62"
Volatile Organic Compounds (VOCs)							
Tentatively Identified	*500*	NA	83.4 J	NA	46.4 J	NA	420 J
Semi-Volatile Organic (SVOCs)							
2-methylnapthalene	*230*	ND	5.1	ND	3.61	ND	ND
Benzo[b]fluorathene	*0.6*	ND	ND	ND	ND	1.19 D J	ND
Benzo[a]pyrene	*0.2*	ND	ND	ND	ND	2.04 D J	ND
Benzo[g,h,i]perylene	*380,000*	ND	ND	ND	ND	1.16 D J	ND
Chrysene	*62*	ND	ND	ND	ND	2.85	ND
Fluoranthene	*2,300*	0.59 D J	ND	ND	ND	5.24 D	ND
Napthalene	*6*	ND	ND	ND	0.86	ND	ND
Phenanthrene	*NLE*	ND	6.27	ND	2.22	2.74 D J	0.84
Pyrene	*1,700*	0.47 D J	ND	ND	ND	4.07 D	ND
Tentatively Identified	*500*	368.7 D J	139.7 J	130.03 J	257.9 J	780 D J	130.8 J
Pesticides							
4,4'-DDD	*3*	0.0044	NA	ND	NA	0.0067	NA
4,4'-DDE	*2*	0.012	NA	0.0031	NA	0.0107	NA
4,4'-DDT	*2*	0.0253	NA	0.0082	NA	0.0154	NA
Dieldrin	*0.04*	ND	NA	0.0031	NA	ND	NA
gamma-Chlordane	*0.2*	ND	NA	ND	NA	0.0026	NA
Heptachlor epoxide	*0.07*	0.0015	NA	ND	NA	ND	NA
PCBs							
Arochlor 1260		ND	NA	0.064	NA	0.09	NA

Results reported in mg/kg
E - Result exceeds calibration limit
D - Result from dilution
J - Estimated Concentration between Reporting Limit and Method Detection Limit
NA - Not Analyzed
ND - Non-detect

Building 1122
Soil Boring Investigation
Paint Booth Shed 1
May 7, 2010
(Continued)

Constituent	NJDEP Residential Soil Remediation Standards	Shed1/B1 0-6"	Shed1/B1 66-72"	Shed1/B2 0-6"	Shed1/B2 84-90"	Shed1/B3 0-6"	Shed1/B3 60-62"
Metals							
Aluminium	*78,000*	4,260	15,800	2,480	15,200	3,190	18,600
Antimony	*31*	1.56	ND	ND	1.19	1.71	1.21
Arsenic	*19*	2.65	8.65	1.62	11.2	3.12	9.47
Barium	*16,000*	14	25.7	10.7	29.1	8.24	26.9
Beryllium	*16*	0.265	1.82	0.123	1.19	0.259	1.48
Cadmium	*78*	1.48	1.31	0.506	0.823	0.59	1.02
Calcium	*NLE*	1,030	302	259	416	401	316
Chromium	*NLE*	23.3	162	13.6	128	28.1	160
Cobalt	*1,600*	2.59	1.08	0.606	0.455	1.28	0.533
Copper	*3,100*	14.5	4.06	9.65	5.02	6.81	6.33
Iron	*NLE*	24,200	47,200	10,400	32,200	9,360	39,400
Lead	*400*	545	8.91	138	6.25	2,840	7.82
Magnesium	*NLE*	886	6,400	380	4,040	1,310	5,440
Manganeese	*11,000*	108	22.2	34.2	31.1	36.4	39.2
Mercury	*23*	0.227	0.016	0.028	0.02	0.159	ND
Nickel	*1,600*	5.44	7.32	3.47	4.67	2.99	5.99
Potassium	*NLE*	1,300	14,700	740	6,780	1,710	10,400
Selenium	*390*	ND	ND	ND	ND	ND	ND
Silver	*390*	3.06	5	1.44	3.45	1.29	4.24
Sodium	*NLE*	ND	ND	ND	ND	ND	439
Thallium	*5*	ND	ND	ND	ND	ND	ND
Vanadium	*78*	13.5	82 j	9.1	65.8	17.2	81.3
Zinc	*23,000*	1,500	47.4	90.6	32.6	2,180	47.4

Results reported in mg/kg
E - Result exceeds calibration limit
D - Result from dilution
J - Estimated Concentration between Reporting Limit and Method Detection Limit
NA - Not Analyzed
ND - Non-detect

Building 1122
Soil Boring Investigation
Chemical Storage Shed 2
May 10, 2010

Constituent	NJDEP Residential Soil Remediation Standards	Shed2/B1 0-6"	Shed2/B1 60-66"	Shed2/B2 0-6"	Shed2/B2 72-78"	Shed2/B3 0-6"	Shed2/B3 54-60"
Volatile Organic Compounds (VOCs)							
Tentatively Identified	*500*	NA	20.580 J N	NA	ND	NA	ND
Semi-Volatile Organic (SVOCs)							
Benzo[b]fluorathene	*0.6*	0.25 J	NA	0.24 J	NA	2.48 D J	NA
Benzo[k]fluorathene	*6*	ND	NA	ND	NA	2.55 D J	NA
Benzo[a]pyrene	*0.2*	0.11 J	NA	ND	NA	1.03 D J	NA
Chrysene	*62*	0.14 J	NA	ND	NA	1.58 D J	NA
Fluoranthene	*2,300*	0.28 J	NA	0.22 J	NA	2.74 D	NA
Phenanthrene	*NLE*	ND	NA	ND	NA	1.27 D J	NA
Pyrene	*1,700*	0.21 J	NA	0.17 J	NA	2.17 D J	NA
Tentatively Identified	*500*	ND	NA	138.93 J	NA	774 D J	NA
Pesticides							
4,4'-DDD	*3*	0.0189	NA	0.0021	NA	0.0051	NA
4,4'-DDE	*2*	0.0214	NA	0.0119	NA	0.0278	NA
4,4'-DDT	*2*	0.0476	NA	0.0168	NA	0.0356	NA
Chlordane	*0.2*	0.0152	NA	ND	NA	ND	NA
Heptachlor epoxide	*0.07*	ND	NA	0.0022	NA	ND	NA

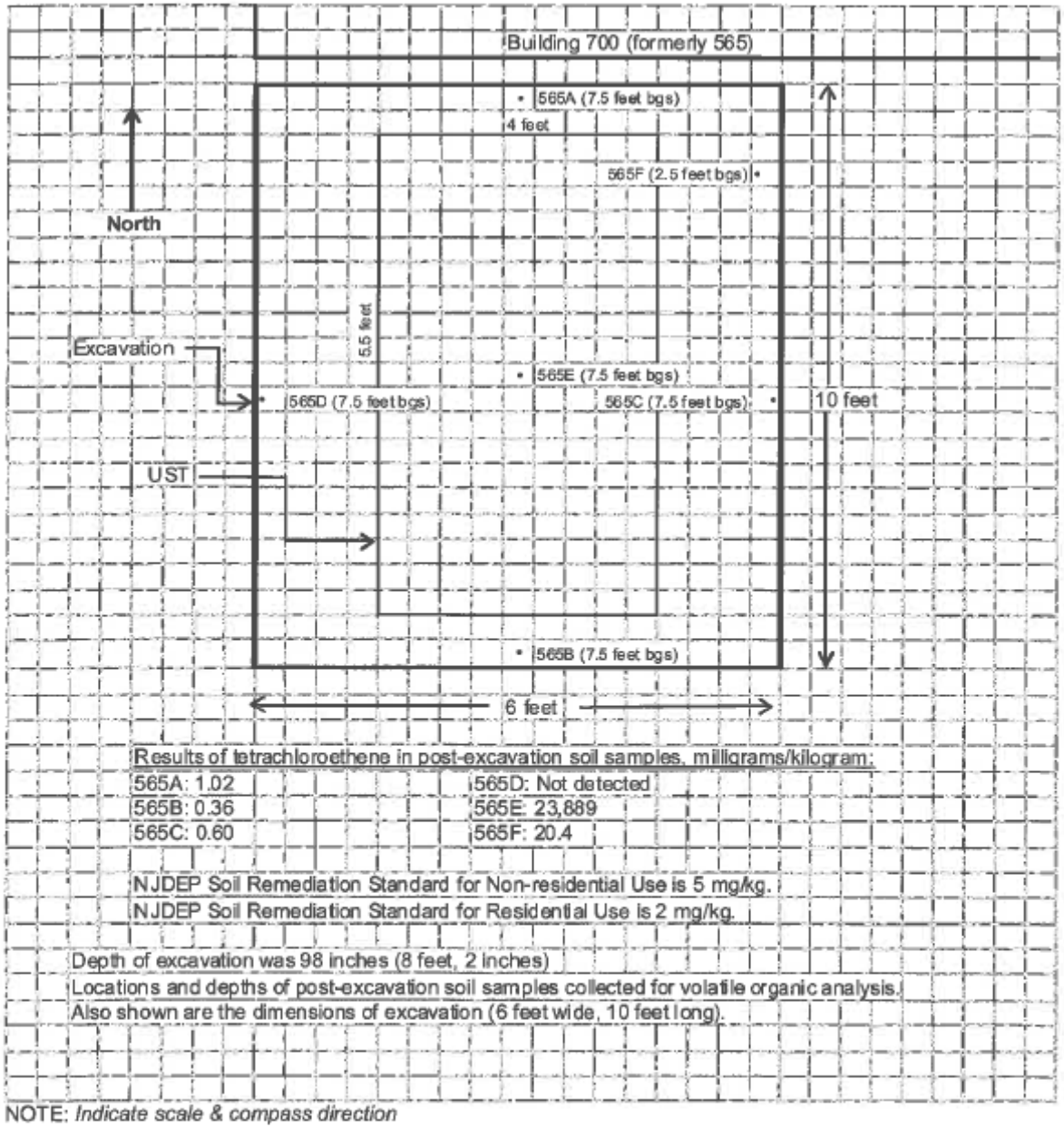
Results reported in mg/kg
E - Result exceeds calibration limit
D - Result from dilution
J - Estimated Concentration between Reporting Limit and Method Detection Limit
NA - Not Analyzed
ND - Non-detect

Building 1122
Soil Boring Investigation
Chemical Storage Shed 2
May 10, 2010
(Continued)

Constituent	NJDEP Residential Soil Remediation Standards	Shed2/B1 0-6"	Shed2/B1 60-66"	Shed2/B2 0-6"	Shed2/B2 72-78"	Shed2/B3 0-6"	Shed2/B3 54-60"
Metals							
Aluminium	*78,000*	2,950	17,000	7,570	11,300	10,300	12,300
Antimony	*31*	1.05	0.81	ND	ND	1.69	1.41
Arsenic	*19*	2.9	9.27	4.1	4.53	7.61	3.24
Barium	*16,000*	9.66	25.2	18.8	33.5	35.6	21.5
Beryllium	*16*	0.192	1.46	0.404	1.27	0.773	1.35
Cadmium	*78*	0.335	0.968	0.517	0.671	0.749	0.727
Calcium	*NLE*	1050	440	357	517	2,400	237
Chromium	*NLE*	17.2	155	35.4	92.4	70.3	106
Cobalt	*1,600*	0.528	0.331	0.812	0.245	1.58	0.448
Copper	*3,100*	6.76	7.02	8.33	5.02	11	2.93
Iron	*NLE*	5,800	37,200	12,900	28,000	22,100	30,400
Lead	*400*	48.6	8.8	16.6	5.62	22.3	7.14
Magnesium	*NLE*	904	5,180	1,160	3,950	2,750	4,430
Manganeese	*11,000*	32.7	33.2	55.8	42.2	91.8	37
Mercury	*23*	0.028	0.025	0.04	ND	ND	0.052
Nickel	*1,600*	2.3	5.35	4.37	4.51	5.62	5
Potassium	*NLE*	1,160	9,730	2,110	8,050	5,220	9,680
Selenium	*390*	ND	ND	ND	ND	ND	ND
Silver	*390*	0.785	3.87	1.46	3.15	2.38	3.4
Sodium	*NLE*	ND	427	2,490	392	ND	362
Thallium	*5*	ND	ND	ND	ND	ND	ND
Vanadium	*78*	11.7	79.1	27.9	49.4	46.3	54.3
Zinc	*23,000*	119	51.1	93.3	32.4	414	33.4

Results reported in mg/kg
E - Result exceeds calibration limit
D - Result from dilution
J - Estimated Concentration between Reporting Limit and Method Detection Limit
NA - Not Analyzed
ND - Non-detect

APPENDIX C-5
HISTORICAL INFORMATION FOR FTMM-68



NOTE: *Indicate scale & compass direction*

REMARKS

Scale: Not to Scale (see map for dimensions)

BLDG # 700 (formerly 565)
DATE: April 11, 2011
SPILL TYPE: Leaking UST
RESPONDERS: J. Montgomery, F. Accorsi

APPENDIX D
ACCIDENT PREVENTION PLAN

(This is a placeholder only; the APP was prepared under separate cover)

APPENDIX E
SAMPLING AND ANALYSIS PLAN

(This is a placeholder only; the SAP was prepared under separate cover)