DEFENSE ENERGY SUPPORT CENTER
CONTRACT NO. SPO600-98-C-5305

4

WORK PLAN FOR SITE CLOSURE
TANK FARM 3

DEFENSE FUEL SUPPORT POINT – MELVILLE
PORTSMOUTH, RHODE ISLAND

August 2002

Prepared by

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Revision	Date	Prepared By	Approved By	Pages Affected
0	8/29/02	M. Weed	L. Kahrs	All

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1.0 INTRODUCTION

This Work Plan for Site Closure has been prepared on behalf of Defense Energy Support Center (DESC) for Tank Farm 3 at the former Defense Fuel Support Point (DFSP) Melville. The objective of this Work Plan is to present information pertaining to Tank Farm 3 (hereinafter referred to as "the site") including data collection, data evaluation, and data gap analysis, in order to obtain closure of the site and conveyance of the property to the United States Department of the Navy (the Navy) for re-use. Specifically, this Work Plan seeks to address the requirements of the Rhode Island Department of Environmental Protection (RIDEM) relative to the closure of the underground storage tanks (USTs) located at the site and activities associated with the storage and transfer of petroleum products.

Previous site investigations, analytical results, and other documents pertaining to Tank Farm 3 have been obtained and a compilation of past activities and site characterization results have been undertaken. From this compilation the current condition of the site, with respect to soil, groundwater, and non-aqueous phase liquid (NAPL), has been identified. This current condition was determined by reviewing the most recent data collection that has occurred onsite, comparing any detected contaminants with the appropriate RIDEM criteria for each media, and by determining the presence of NAPL. This review has led to the identification of apparent data gaps, questions, and potential issues relative to the closure of the site. In order to answer these questions and address these issues, additional sampling may be needed. It is the intent of this Work Plan to present both the Navy and RIDEM with an overall strategy for closure of this site, obtain agreement between DESC, the Navy, and RIDEM concerning this strategy, and implement any additional data acquisition that may be needed. Once these data needs are assessed and filled, the site conditions will be reassessed, any required responses will be performed, and the site will be conveyed back to the Navy for re-use.

1.1 Purpose

In April 2002, DESC provided RIDEM with a letter outlining our approach towards closure of DFSP Melville. Specifically, this letter described our overall approach for each of the sites (Tank Farms 1, 2, and 3 and the Terminal Area). This letter also provided a detailed approach to meet the requirements of RIDEM at Tank Farm 3.

In consultation with the Navy, and in an effort to move the project along, the Work Plan for Site Closure is submitted for your information. The purpose of this Work Plan is to provide RIDEM with a description of the approach and strategy at Tank Farm 3. This is the first of the four sites proposed for closure by DESC and the Navy.

Foster Wheeler Environmental Corporation (Foster Wheeler) proposes to utilize a risk-based approach at each site, with site-specific criteria developed for contaminants of concern and the current and foreseeable use of each site. The use of this approach is consistent with both the RIDEM Underground Storage Tank (UST) and the Remediation Regulations.

1.2 Organization

This Work Plan for Site Closure is divided into five sections, each covering a different aspect of the closure strategy.

- Section 2.0 – This section describes the background of Tank Farm 3. The site location, topography, geology, hydrogeology, current/future land use, regulatory setting, and environmental setting are discussed.

- Section 3.0 – This section describes the facility description and activity history at Tank Farm 3. The operational history of Tank Farm 3, recorded spills and releases, previous investigations, response actions, and closure activities are discussed in this section.

- Section 4 – This section describes the Conceptual Site Model (CSM) derived for the site. This CSM describes the potential primary and secondary sources of contamination at the site, the migration and transport mechanisms associated with these sources, and the potential intake routes of human and ecological receptors affected by these sources.

- Section 5 – This section describes the environmental status of the potential source areas associated with Tank Farm 3. It discusses those potential source areas that have been adequately addressed and those that have outstanding questions and issues.

- Section 6 – In this section, the proposed closure strategy for Tank Farm 3 is discussed. This closure strategy includes supplemental sampling and investigation, follow-up response action, institutional controls, and proposed soil and groundwater restrictions.

2.0 SITE BACKGROUND

2.1 Site Description and Surrounding Area Description

Tank Farm 3 is located in the southwestern portion of Portsmouth, Rhode Island, approximately 1 mile south of the DESC Melville Terminal. Figure 2-1 presents the site location map. The 40-acre site is adjoined by the Navy's Defense Highway to the northwest, Raytheon's Submarine Signal Division plant to the northeast, Bayview Estates (residential condominiums) to the southeast, and undeveloped woodlands to the southwest. Other nearby features include: Tank Farm 4 (located 700 feet south of the site); a playground and recreational camp site (located 300 feet southwest of the site); Narragansett Bay (located 100 feet northwest of the site); and the Lawton Valley Reservoir (located 2,000 feet southeast of the site). The Lawton Valley Reservoir is a drinking water supply for the City of Newport and the Towns of Middleton and Portsmouth, and is located hydraulically upgradient of the site to the southeast.

The site consists of five 1.18 million gallon concrete underground storage tanks (Tanks 32 to 36) and two 2.1 million gallon steel underground storage tanks (Tanks 69 and 70) (Figure 2-2). Throughout the history of the site, these tanks were used to store aviation fuels (JP-4, JP-5, and JP-8) and marine diesel fuel. All tanks are cylindrical in shape and are located approximately 5 feet below grade.

The tank farm is covered with grass, paved access roads, and miscellaneous transfer pump and control chambers. An outdoor electrical transformer is located in the southwest portion of the site and an indoor electrical transformer is located in the electrical control house (structure 227). Underground petroleum distribution lines interconnect the underground storage tanks. These fuel lines are located approximately 4 feet below grade and run underground to the DFSC's Melville Terminal located one mile north of the site.

Ring drains, which act as a groundwater underdrainage system to prevent excessive hydrostatic uplift pressures on the bottom of the tanks, are located around each of the underground storage tanks. The ring drains around Tanks 32 to 36 are reportedly 6 feet above the bottoms of the tanks. Ring drains around Tanks 69 and 70 have not been identified, however, it is believed that these ring drains are similar in design to the ones associated with Tanks 32 to 36. The ring drains connect to a common 12-inch drainage pipe, which discharges via gravity to an oil/water separator located in the northwest portion of the site.

The oil/water separator's design flow rate is 250 gallons per minute, and discharges to Lawton Brook, approximately 100 feet upstream of Narragansett Bay. This outfall (#005) is regulated by a RIPDES permit. A 5,000 gallon underground storage tank is located adjacent to the oil/water separator which is used to store floating petroleum product that may accumulate in the oil/water separator.

Table 2-1 summarizes the UST system and the contents of each tank prior to closure activities, conducted both in 1997 and 2000.

2.2 Topography

The site slopes from a high area of approximately 100 feet above MLW datum in the south central portion of the site, to a low of approximately 40 feet MLW on the northwest side of the site (along the Defense Highway), and to a low of approximately 10 feet MLW on the northeastern side of the site (along Lawton Brook). Lawton Brook flows northwesternly across the site and discharges into Narragansett Bay.

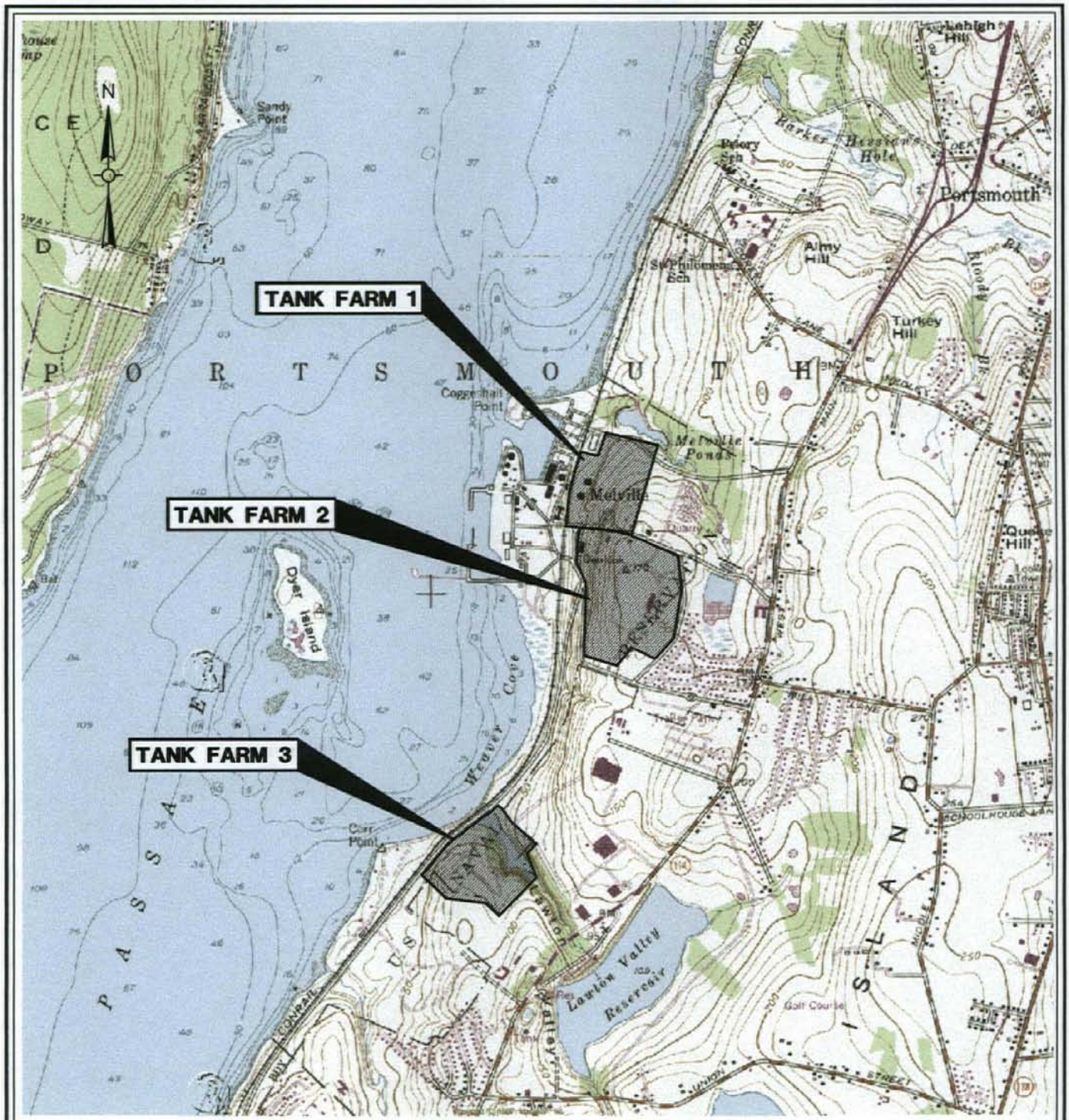

FIGURE 2-1

DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

SITE LOCATION MAP

SCALE: AS SHOWN

CADDFILE: DESC007.DWG

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

P E SEALS

Date	JUNE 1999
Scale	AS SHOWN
Designed by	E GRIFFIN
Drawn by	F MENICHELLI
Checked by	L KAHRS
Approved by	I KAHRS

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DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

TANK FARM 3
SITE PLAN

RAYTHEON'S SUBMARINE SIGNAL DIVISION

PROPERTY LINE

WETLAND/ RESERVOIR

WOODED AREA

BAYVIEW ESTATES

FENCE (TYPICAL)

LAWTON BROOK

WETLAND

TO MAIN TERMINAL

DAM

SW-3

OUTFALL # 005

SW-2

SW-1

UNDERGROUND UNDERDRAINAGE UTILITY LINE (TYP.)

STRUCTURE 227 ELECTRICAL CONTROL HOUSE

STRUCTURE 228 VALVE HOUSE

UNDERGROUND PETROLEUM DISTRIBUTION LINE (TYP.)

TANK 69

TANK 70

TANK 36

TANK 32

TANK 33

TANK 34

TANK 35

SEEPAGE OF PRODUCT FROM TANK

STORM DRAIN CULVERT

CATCH BASIN

STORMWATER COLLECTION PIT

APPROXIMATE SURFICIAL EXTENT OF AREA IMPACTED BY EARLY 1980'S JP-5 FUEL SPILL

5,000-GALLON UNDERGROUND STORAGE TANK

OIL/WATER SEPARATOR #4

OIL/WATER SEPARATOR #3

APPROXIMATE LOCATION OF FORMER SAND FILTER (BURNING PIT) (BASED ON 4/6/65 AERIAL PHOTO)

MANHOLE (TYPICAL)

RING DRAIN UNDERDRAINAGE SYSTEM (TYPICAL)

OUTDOOR ELECTRICAL TRANSFORMER

ELECTRICAL SUBSTATION

NARRAGANSETT BAY

DEFENSE HIGHWAY

PENN CENTRAL RAILROAD RIGHT OF WAY

UNDEVELOPED WOODLAND

LEGEND.

- 100 — GROUND SURFACE CONTOUR (BASED ON MEAN LOW WATER DATUM)
- SW-3 ▲ SURFACE WATER SAMPLING LOCATION
- GT-301 ⊕ MONITORING WELLS INSTALLED FOR GROUNDWATER TECHNOLOGY (SEPTEMBER OF 1992)
- B-3 ● TEST BORINGS PERFORMED BY GZA DRILLING, INC. BETWEEN DECEMBER 5 AND 7, 1995 OBSERVED BY GZA PERSONNEL
- GZ-301 ⊕ BORINGS PERFORMED AND MONITORING WELLS INSTALLED BY GZA DRILLING, INC. BETWEEN OCTOBER 1994 AND APRIL 1997, OBSERVED BY GZA PERSONNEL
- RW-301 ◆ PUMP TEST WELL INSTALLED BY D.L. MAHER DRILLING COMPANY BETWEEN JUNE 16 AND 17, 1997, OBSERVED BY GZA PERSONNEL
- SG3-15 ◑ SOIL GAS SAMPLING
- SS03 ESW1-5, MSW1-8 ● CONFIRMATORY SAMPLE LOCATIONS BY FOSTER WHEELER ENVIRONMENTAL
- TANK 33 — UNDERGROUND STORAGE TANK

NOTES.

1 BASE PLAN WAS DERIVED AND DIGITIZED BY FOSTER WHEELER ENVIRONMENTAL CORPORATION IN MAY 1999 FROM DRAWING ENTITLED "DFSC/TANK FARM 3 – SITE PLAN", PROJECT NO 31288.9, FIGURE NO 1, CAD FILE. TANK-3.DWG, VIEW TANK3-LARGE, DATED JANUARY 1998, BY GZA ENVIRONMENTAL, INC.

2 ORIGINAL BASE PLAN WAS DEVELOPED FROM A PLAN PROVIDED BY NAVAL FACILITIES ENGINEERING COMMAND ENTITLED "NAVAL COMPLEX NEWPORT, R.I. MELVILLE (SOUTH)", ORIGINAL SCALE 1"=400', DRAWING NO 944,208

3 THE LOCATIONS AND ELEVATIONS OF THE BORINGS WERE APPROXIMATELY DETERMINED BY SURVEY FROM EXISTING TOPOGRAPHIC AND MAN-MADE FEATURES. THE LOCATIONS OF THE TANKS WERE DETERMINED BY PACING FROM EXISTING TOPOGRAPHIC FEATURES. THE LOCATIONS OF THE UTILITY LINES WERE INTERPOLATED FROM A PLAN ENTITLED "FUEL DISTRIBUTION SYSTEM STORAGE TANKS 32-36, 69 & 70 AREA B PLOT PLAN", BY J.M. McCUSKER CO., DATED JUNE 11, 1954, DRAWING NO Y&DM 827332, ORIGINAL SCALE 1"=50' THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED

0 100 200
SCALE IN FEET

PROJECT NO

CADD FILE NO
DESC004.DWG

DRAWING NO
FIGURE
2-2
SHEET 1 OF 1

Table 2-1
Tank Farm 3 Underground Storage Tank System and Contents

Tank Nos	Tank Description	Tank Contents	Gauging Information		Insp. date (passed)	Certif. No.	Tank Conditions	Structural Integrity
			Product Thickness (ft)	Water Thickness (ft)				
32	concrete	JP-8	0	0	8/29/96	632	Thirty-two areas with spalled surfaces detected, efflorescence noted. Another area had spalled revealing the aggregate. The roof had not been coated. Surface cracks were noted in two areas.	GOOD
33	concrete	JP-8	0	0.05	8/29/96	633	Six areas with spalled surfaces detected, efflorescence noted. Floor coating was worn and disbonded. The roof area had not been coated. There was evidence of crazing or working cracks with the exception of efflorescence found around piping/fittings.	GOOD
34	concrete	JP-8	0	0.02	8/29/96	634	Thirteen areas with spalled surfaces detected, efflorescence and oil product were noted. Roof had not been coated, one working crack detected in roof.	GOOD
35	concrete	JP-8	0	0.02	12/20/96	657	Several cracks detected in floor and along chine area. Most of these cracks were weeping but no efflorescence. Two areas along chine that had weeping. Roof area was not coated and several cracks were noted.	GOOD
36	concrete	JP-8	0	0	12/20/96	658	Roof had not been coated. Several cracks noted in roof.	GOOD
69	steel	JP-5	0	0	8/29/96	631	No through holes or thinning detected in shell, support structures for shell in good condition, no pitting or deterioration of floor, weeping noted from pin holes in floor seams.	GOOD
70	steel	JP-5	0	0.11	8/9/96	625	No through holes or thinning detected in shell, support structures for shell in good condition, no pitting or deterioration of floor.	GOOD

Notes:
Tank Contents, Product Thickness, and Water Thickness were determined in November of 1998.
The Structural Integrity column is the overall designation relative to the structural integrity given by PCA Engineering, Inc. (PCA).
All tanks have been cleaned, mucked, washed, and ventilated. Tank is gas free and oil free. Tank is safe for workers, hot work, and abandonment.

The geology of the site consists of glacial till underlain by relatively shallow bedrock. The thickness of the glacial till ranges from 0 to 25 feet and was generally a medium dense to very dense unsorted mixture of gravel, sand, and silt, with occasional boulders. The till typically contains 20 to 30 percent silt. Bedrock beneath the site is predominantly metamorphosed shale, with varying amounts of sand/siltstone, conglomerate, schist, and phyllite. The upper 3 to 20 feet of bedrock is highly weathered and fractured. Generally the bedrock becomes less weathered with depth.

2.3 Generalized Geology and Hydrogeology

The geology at Tank Farm 3 is generally typified by highly fractured shale bedrock, overlain by a thin veneer of glacial till. The bedrock is Pennsylvanian in age and exhibits relatively horizontal bedding in the area of the site. Thickness of the overburden glacial material ranges from zero to seven feet in thickness. Bedrock outcrops can be observed in many areas of the site.

The construction of the Tank Farm involved "cut and cover" construction techniques, involving the removal of the bedrock material at the planned location of each tank. This material was either excavated or blasted to create a depression, and each tank constructed in place within this depression. Bedrock spoil material was usually placed around the constructed tank after construction, and additional fill material imported to cover each tank. The completed tank is not visible at grade and the upper portion lies approximately four to six feet below grade. Only the valve house, pump house, and vents are visible at grade.

The groundwater at the site predominately lies in the Pennsylvanian bedrock. It is recognized that rainwater and surface water infiltrate the overburden material, however a saturated zone is not present within this material. The saturated zone within the bedrock material ranges from one to thirty feet beneath grade. Groundwater fluctuates between five and nine feet at the site during the year.

In conjunction with the Tank Farm construction, each tank has a ring drain system to prevent hydraulic uplift forces on the UST. These ring drains encircle the bottom of each tank at a depth of approximately 25 feet below grade. These ring drains operate via gravity, as the Tank Farm lies at a relatively higher elevation compared to the surrounding topography. All collected groundwater is currently directed to an oil/water separator at the site, prior to discharge at the RIPDES outfall located at Lawton Brook.

In order to evaluate the extent of contamination onsite, a CSM approach was used. The CSM is used to gain a better understanding of the source, pathway, and receptor analysis that are needed to evaluate releases to the environment. A cross-sectional pictorial CSM of Tank Farm 3 showing a "cut and cover" tank and typical site geology is presented in Figure 2-3.

Figure 2-3 suggests that these ring drains constantly effect the local groundwater flow at the site. The observed groundwater levels at the site are constantly depressed, with a localized sink created around each UST. The CSM also suggests that these rings would convey any free liquids and dissolved contamination from around each tank and into the oil/water separator system onsite. The ring drain system has acted to minimize potential contamination from the site on a continuing basis.

2.4 Current/Future Land Use

The current land use of the site is industrial/commercial. The tanks at the site have been cleaned and certified gas free in the 1996. Presently, DESC has ceased operation and vacated the site.

The re-use scenario projected for Tank Farm 3 is also industrial/commercial as a restricted recreational open space.

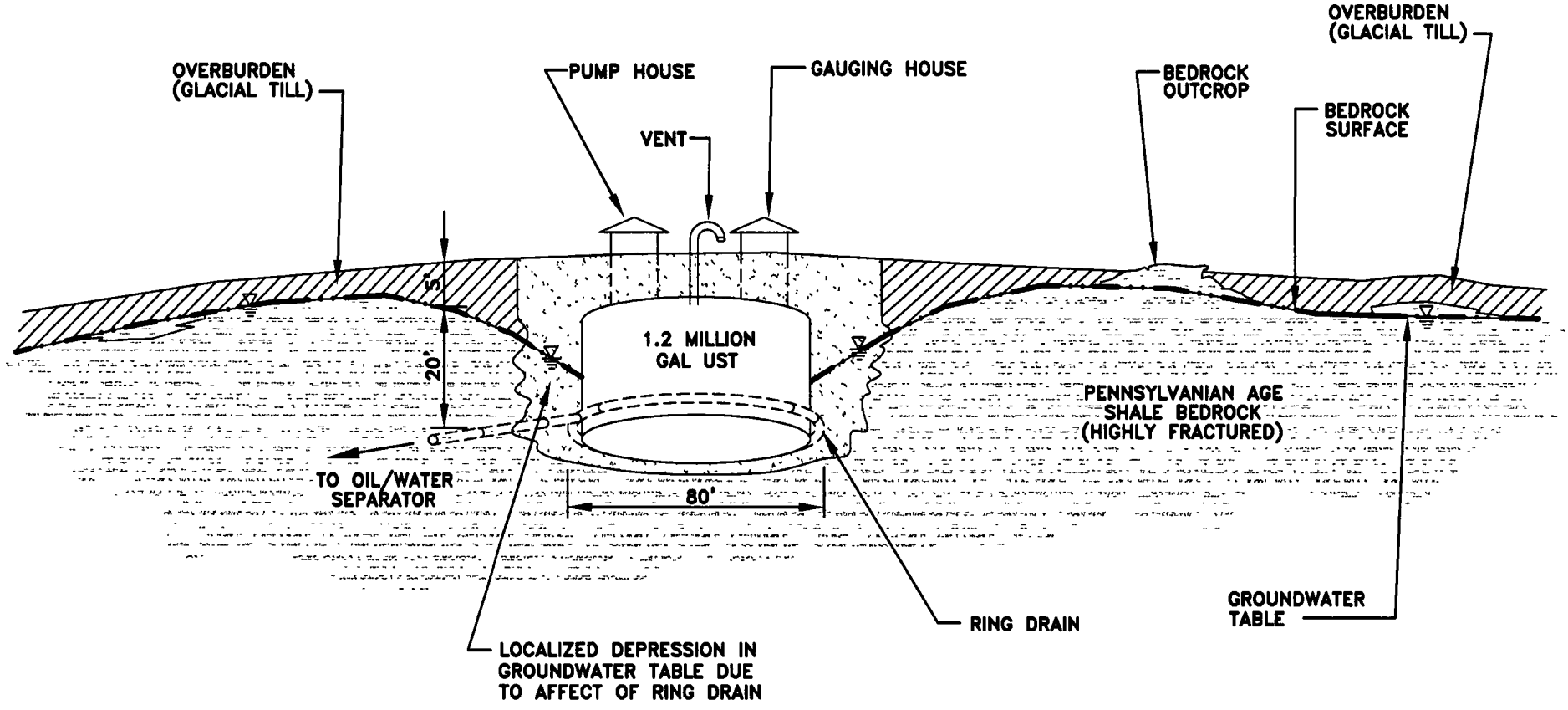


FIGURE 2-3

DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

GENERALIZED CROSS-SECTION OF TANK FARM 3 SHOWING "CUT AND COVER" TANK AND TYPICAL SITE GEOLOGY

NOT TO SCALE

CADDFILE: 10060000_A0013.DWG

2.5 Regulatory Setting

2.5.1 Regulatory Jurisdiction

The Tank Farm 3 property is owned by the Navy and, since 1974, DESC (formerly DFSC) has leased the property. Conditions of the lease stipulate that DESC meets all local, State, and Federal requirements for cleanup and closure of petroleum-related releases prior to conveyance of the property back to the Navy. For this reason, DESC seeks to meet the RIDEM UST requirements regarding the closure of the tank system at the Tank Farm 3 site.

It is also recognized that the Navy, RIDEM, and the United States Environmental Protection Agency (USEPA) have established a Federal Facilities Agreement (FFA) concerning the regulatory framework and responsibilities at this site. All work proposed in this Work Plan shall be done in consultation with the Navy in order to ensure that this work is consistent with the provisions of the FFA.

2.6 Environmental Setting

2.6.1 Groundwater Classification

The groundwater beneath the site has been classified by RIDEM as GA-NA (non-attainment). Groundwater classified as GA-NA is groundwater classified as GA (high resource value) but does not meet the standards established for the respective class due to presumed contamination associated with specific sources. The remaining properties in the vicinity of the site are classified as GA; groundwater resources that are known or presumed to be suitable for drinking water use without treatment. The tank farm and surrounding properties are serviced by a municipal water supply. It should be noted that the water service in the tank farm is only used for fire protection.

2.6.2 Surface Water Classification

The Lawton Valley Reservoir is located 2,000 feet southeast of the site. Lawton Brook has been classified by RIDEM as a Class A surface water body. Class A surface water bodies are suitable for drinking water supplies and all other water uses. Narragansett Bay is located 100 feet northwest of the site and (in the vicinity of the site) is classified as a Class SC water body. Class SC waters are saltwater bodies that are suitable for fish and shellfish habitat, but not for bathing or shellfish harvesting for human consumption.

2.7 Background Determination

Background concentrations are ambient concentrations that are present in the environment in areas that have not been influenced by human activities or concentrations present in the environment in the vicinity of the contaminated site which are a result of human activities unrelated to releases at the contaminated site. Background concentrations will be established for the following media onsite and Figure 2-2 presents the sampling and well locations associated with these media.

2.7.1 Soil

Arsenic is a naturally occurring toxic element, which is normally found in soils at concentrations ranging between 1 to 20 milligrams per kilogram, depending on the source rock type. Certain rock types found in Rhode Island can contain significant concentrations of arsenic-bearing minerals. The soil deposits overlying the bedrock in Rhode Island will have varying concentrations of arsenic depending on the parent rock and the mode of deposition. Man-made sources of arsenic include coal and coal ash,

agricultural chemicals (i.e., pesticides and herbicides), and chemicals used in the processing of animal hides.

In 1992, a composite sample was taken from soil borings GT-301 to GT-307. The concentration of arsenic (6 mg/kg) in this composite sample exceeded the RIDEM Industrial/Commercial Direct Exposure Criterion (3.8 mg/kg). Also, soil samples collected during the excavation of soil near Tank 35 exhibited exceedances of this Arsenic Criterion.

In order to evaluate background concentrations of arsenic in the soil onsite, additional soil sampling will be required. Additional soil samples will be collected in conjunction with the supplemental investigative activities described in this Work Plan.

2.7.2 Groundwater

Based upon localized groundwater flow at the site, wells GT-303, GT-304, and GT-305 are upgradient locations and are considered to be background wells for Tank Farm 3. These three wells were sampled in June of 1999. All analytes were below the RIDEM GA Groundwater Objectives.

2.7.3 Screening Criteria

In order to attain site closure, applicable soil and groundwater criteria will apply. These criteria are defined in RIDEM's *Remediation Regulations*.

2.7.3.1 Soil

The RIDEM *Remediation Regulations* specify that any soil contaminated as a result of a release of hazardous materials is to be remediated in accordance with the applicable Direct Exposure and Leachability Criteria. The Method 1 Industrial/Commercial Direct Exposure Criteria was used to compare to the analytical data obtained from soil samples taken across the site. This criteria was applicable because (Rule 8.02 A, *i,* 2a-d):

- the site is currently limited to industrial/commercial activity;
- access to the property is limited to individuals working or temporarily visiting the site;
- the current and reasonably foreseeable future human exposure to soils is not expected to occur beyond a depth of 2 feet bgs; and
- an environmental land use restriction is in effect with respect to the property (This restriction is proposed as part of this Work Plan).

Due to the GA-NA classification, the Method 1 GA Leachability Criteria were applied to the soil data. No samples exceeded these criteria.

Since Total Petroleum Hydrocarbons (TPH) can be a useful indicator of potential adverse impacts to human health, TPH Soil Objectives are also applied to the site (Direct Exposure and GA Leachability Criteria). The Method 1 Industrial/Commercial TPH Direct Exposure Objective and the Method 1 GA TPH Leachability Criterion were compared to the analytical data from the soil samples collected onsite. TPH was found to exceed both standards around Tank 35 where the surficial spill occurred. This exceedance, though, was 14 feet bgs, near the base of the tank, where further excavation was not practical.

2.7.3.2 Groundwater

As stated in RIDEM's *Remediation Regulations*, groundwater contaminated as a result of a release of hazardous materials located in a GA area shall be remediated to a concentration that meets the Method 1 GA Groundwater Objectives for each chemical detected on site. As stated previously, lead, naphthalene, and bis(2-ethylhexyl)phthalate are the three analytes that exceed the GA Groundwater Objectives in 1999.

3.0 FACILITY DESCRIPTION AND HISTORY

3.1 Facility History

The United States Navy has owned this property since at least the 1940s. Tanks 32 to 36 were installed in the early 1940s and Tanks 60 and 70 were installed in 1953 and 1954, respectively. The tank farm was operated by the Navy from the 1940s to 1974, and has been controlled by DESC ever since. Presently, DESC maintains contractual control of the facility, but has ceased operation at the property.

Tanks 32 to 36 were formerly used to store marine diesel fuel and were changed over to storing jet propulsion (JP)-5 jet fuel between 1978 and 1986, and then to JP-8 in 1994. Tanks 69 and 70 were formerly used to store JP-5 jet fuel and were changed over to storing JP-4 jet fuel in 1980 and 1993, respectively, and then back to JP-5 in 1994

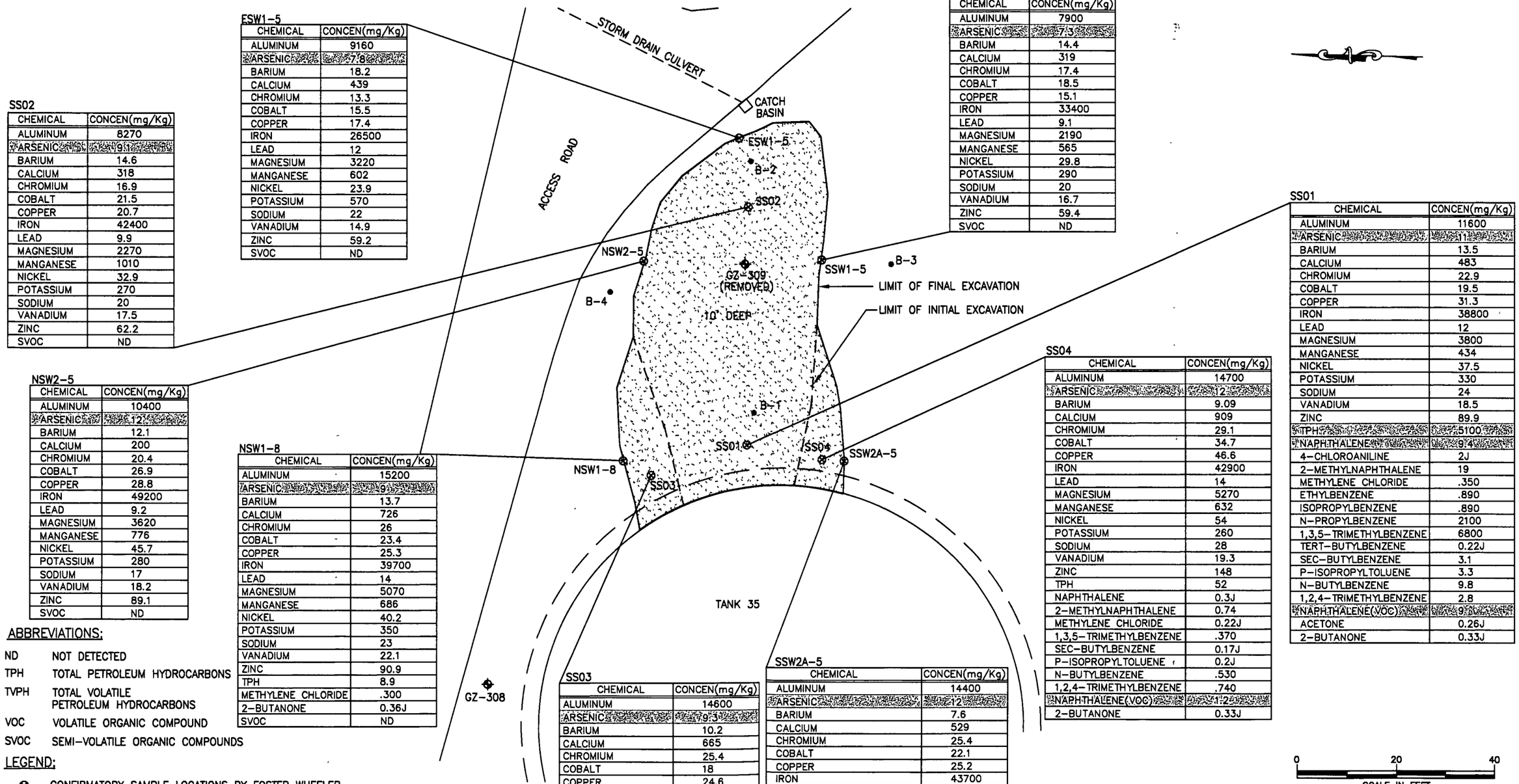
In addition to cleaning the tanks, the tank bottoms were periodically stripped to remove bottom sediments and water. Prior to 1974, the tank bottoms were reportedly pumped to a sand filter that was located northwest of Tank 32 (Figure 2-2). The filtered water was reportedly discharged to Narragansett Bay. Residual oil remaining in the sand filter was reportedly burned or scraped off and removed to an off-site "dump site". The sand filter was also apparently used in the past for the discharge of the groundwater from the ring drains (prior to the installation of the oil/water separator). Since 1974, the tank bottoms have reportedly been disposed of at off-site facilities. According to Navy records, the sand filter, along with some of the surrounding soils, were reportedly removed from the site around 1974. About this same time, the oil/water separator was installed at the site.

3.2 Spills and Releases

A confirmed release of JP-5 from Tank 35 occurred onto the surficial soil in the early 1980s after the tank was inadvertently overfilled. Approximately 50,000 to 60,000 gallons were spilled and about 4,000 gallons were recovered. GZA Environmental provided a Supplemental Investigation and Corrective Action Plan (CAP) to RIDEM concerning this release in February 1998. Foster Wheeler responded to RIDEM's comments on this CAP in the summer of 1999 and implemented the corrective action. On September 2, 1999, excavation began on the east side of the tank to remove soil contaminated by the previous surficial soil spill. During the excavation, approximately 1,200 cubic yards of soil were removed. On October 6, 1999, additional soil was removed (650 cubic yards) from the north wall, south wall, and bottom of the excavation closest to Tank 35 where TPH levels had exceeded RIDEM Residential TPH standards. To confirm that the limits of contamination had been reached, several test pits were dug in the vicinity of Tank 35 beyond the limits of final excavation (Figure 3-1). No visible or olfactory contamination was observed and all headspace readings were non-detect in all test pits.

In 1992, a petroleum leak was observed from Tank 70 and a Notice of Violation (NOV) was issued by RIDEM. The NOV required well installations and soil and groundwater testing in the vicinity of the tank leak. Seven monitoring wells were installed (GT-301 to GT-307) and soil and groundwater samples were collected and analyzed.

Interviews with previous workers at the tank farm, revealed that a sludge pit is buried in one area on the site. This pit consists of the tank cleaning wastes from Tanks 69 and 70 that were buried until the early 1970s. Additional investigation to locate this sludge pit is described later in this Work Plan.



ESW1-5

CHEMICAL	CONCEN(mg/Kg)
ALUMINUM	9160
ARSENIC	7.8
BARIUM	18.2
CALCIUM	439
CHROMIUM	13.3
COBALT	15.5
COPPER	17.4
IRON	26500
LEAD	12
MAGNESIUM	3220
MANGANESE	602
NICKEL	23.9
POTASSIUM	570
SODIUM	22
VANADIUM	14.9
ZINC	59.2
SVOC	ND

SSW1-5

CHEMICAL	CONCEN(mg/Kg)
ALUMINUM	7900
ARSENIC	7.3
BARIUM	14.4
CALCIUM	319
CHROMIUM	17.4
COBALT	18.5
COPPER	15.1
IRON	33400
LEAD	9.1
MAGNESIUM	2190
MANGANESE	565
NICKEL	29.8
POTASSIUM	290
SODIUM	20
VANADIUM	16.7
ZINC	59.4
SVOC	ND

SS02

CHEMICAL	CONCEN(mg/Kg)
ALUMINUM	8270
ARSENIC	9
BARIUM	14.6
CALCIUM	318
CHROMIUM	16.9
COBALT	21.5
COPPER	20.7
IRON	42400
LEAD	9.9
MAGNESIUM	2270
MANGANESE	1010
NICKEL	32.9
POTASSIUM	270
SODIUM	20
VANADIUM	17.5
ZINC	62.2
SVOC	ND

SS01

CHEMICAL	CONCEN(mg/Kg)
ALUMINUM	11600
ARSENIC	11
BARIUM	13.5
CALCIUM	483
CHROMIUM	22.9
COBALT	19.5
COPPER	31.3
IRON	38800
LEAD	12
MAGNESIUM	3800
MANGANESE	434
NICKEL	37.5
POTASSIUM	330
SODIUM	24
VANADIUM	18.5
ZINC	89.9
TPH	5100
NAPHTHALENE	9.4
4-CHLOROANILINE	2J
2-METHYLNAPHTHALENE	19
METHYLENE CHLORIDE	.350
ETHYLBENZENE	.890
ISOPROPYLBENZENE	.890
N-PROPYLBENZENE	2100
1,3,5-TRIMETHYLBENZENE	6800
TERT-BUTYLBENZENE	0.22J
SEC-BUTYLBENZENE	3.1
P-ISOPROPYLTOLUENE	3.3
N-BUTYLBENZENE	9.8
1,2,4-TRIMETHYLBENZENE	2.8
NAPHTHALENE(VOC)	9
ACETONE	0.26J
2-BUTANONE	0.33J

NSW2-5

CHEMICAL	CONCEN(mg/Kg)
ALUMINUM	10400
ARSENIC	12
BARIUM	12.1
CALCIUM	200
CHROMIUM	20.4
COBALT	26.9
COPPER	28.8
IRON	49200
LEAD	9.2
MAGNESIUM	3620
MANGANESE	776
NICKEL	45.7
POTASSIUM	280
SODIUM	17
VANADIUM	18.2
ZINC	89.1
SVOC	ND

NSW1-8

CHEMICAL	CONCEN(mg/Kg)
ALUMINUM	15200
ARSENIC	9.3
BARIUM	13.7
CALCIUM	726
CHROMIUM	26
COBALT	23.4
COPPER	25.3
IRON	39700
LEAD	14
MAGNESIUM	5070
MANGANESE	686
NICKEL	40.2
POTASSIUM	350
SODIUM	23
VANADIUM	22.1
ZINC	90.9
TPH	8.9
METHYLENE CHLORIDE	.300
2-BUTANONE	0.36J
SVOC	ND

SS04

CHEMICAL	CONCEN(mg/Kg)
ALUMINUM	14700
ARSENIC	12
BARIUM	9.09
CALCIUM	909
CHROMIUM	29.1
COBALT	34.7
COPPER	46.6
IRON	42900
LEAD	14
MAGNESIUM	5270
MANGANESE	632
NICKEL	54
POTASSIUM	260
SODIUM	28
VANADIUM	19.3
ZINC	148
TPH	52
NAPHTHALENE	0.3J
2-METHYLNAPHTHALENE	0.74
METHYLENE CHLORIDE	0.22J
1,3,5-TRIMETHYLBENZENE	.370
SEC-BUTYLBENZENE	0.17J
P-ISOPROPYLTOLUENE	0.2J
N-BUTYLBENZENE	.530
1,2,4-TRIMETHYLBENZENE	.740
NAPHTHALENE(VOC)	1.2
2-BUTANONE	0.33J

SS03

CHEMICAL	CONCEN(mg/Kg)
ALUMINUM	14600
ARSENIC	9.3
BARIUM	10.2
CALCIUM	665
CHROMIUM	25.4
COBALT	18
COPPER	24.6
IRON	42600
LEAD	13
MAGNESIUM	5220
MANGANESE	509
NICKEL	34.3
POTASSIUM	280
SODIUM	22
VANADIUM	18.4
ZINC	82
TPH	12
METHYLENE CHLORIDE	0.33
2-BUTANONE	0.32J
SVOC	ND

SSW2A-5

CHEMICAL	CONCEN(mg/Kg)
ALUMINUM	14400
ARSENIC	12
BARIUM	7.6
CALCIUM	529
CHROMIUM	25.4
COBALT	22.1
COPPER	25.2
IRON	43700
LEAD	10
MAGNESIUM	5300
MANGANESE	567
NICKEL	41.6
POTASSIUM	190
SODIUM	23
VANADIUM	18.3
ZINC	92.5
TPH	16
BIS(2-ETHYLHEXYL)PHTHALATE	0.19J
METHYLENE CHLORIDE	0.22J
2-BUTANONE	0.38J

ABBREVIATIONS:

ND	NOT DETECTED
TPH	TOTAL PETROLEUM HYDROCARBONS
TVPH	TOTAL VOLATILE PETROLEUM HYDROCARBONS
VOC	VOLATILE ORGANIC COMPOUND
SVOC	SEMI-VOLATILE ORGANIC COMPOUNDS

LEGEND:

- ⊗ CONFIRMATORY SAMPLE LOCATIONS BY FOSTER WHEELER
- • TEST BORINGS PERFORMED BY GZA DRILLING, INC. BETWEEN DECEMBER 5 AND 7, 1995, OBSERVED BY GZA PERSONNEL
- ⊕ BORINGS PERFORMED AND MONITORING WELLS INSTALLED BY GZA DRILLING, INC. BETWEEN OCTOBER 1994 AND APRIL 1997, OBSERVED BY GZA PERSONNEL.
- SHADING INDICATES EXCEEDANCE OF RIDEM DIRECT CONTACT STANDARD

NOTE: HIGHLIGHTED CHEMICALS INDICATE EXCEEDANCE OF RIDEM INDUSTRIAL/COMMERCIAL DIRECT EXPOSURE CRITERIA OR GA LEACHABILITY CRITERIA

FIGURE 3-1

DEFENSE FUEL SUPPORT POINT MELVILLE PORTSMOUTH, RHODE ISLAND

SOIL SAMPLING RESULTS NEAR TANK 35

SCALE: AS SHOWN

CAD FILE: 10060000_A006.DWG

3.3 Previous Investigations Performed at Tank Farm 3

Previous environmental investigations have been conducted at Tank Farm 3 by Envirodyne Engineers, Inc. in 1983, Groundwater Technology, Inc. (GTI) in 1992, GZA, Inc. (GZA) between 1994 and 1998, and Foster Wheeler from 1999 to 2001. The results of each of these investigations are summarized below.

- Initial Assessment Study [1983]

In March 1983, Envirodyne Engineers Inc. completed a Final Initial Assessment Study of 18 study areas at the Naval Education and Training Center (NETC) facility, including Tank Farm 3. This study was performed for the Navy to identify potential threats caused by past practices at naval facilities. The study did not include any soil or groundwater sampling but identified that tank bottom sludge may have been disposed of in a burning chamber (the sand filter) at Tank Farm 3 and recommended additional studies be performed.

- Progress Report on Initial Assessment Conducted in the Vicinity of Tank 70 Located In Tank Farm 3 [1992]

In September 1992, as a result of the recorded leak in Tank 70, RIDEM issued a NOV requiring well installation and soil/groundwater testing in the vicinity of the tank. Groundwater Technology, Inc., under contract to DESC, installed seven monitoring wells, GT-301 to GT-307.

During the drilling of these wells, soil samples were collected at five-foot intervals. They were screened using a FID, and one sample from each of the borings was submitted for analysis for BTEX. Also, one composite sample (GT-301 through GT-307) was analyzed for VOCs, SVOCs, metals, and PCBs. GTI's October 1992 Progress Report revealed:

- Low levels of BETX (<200 ppb) detected in the soil samples;
- The composite sample did not indicate elevated levels of SVOCs, metals, or PCBs relative to analytical method detection limits; and
- The composite sample exhibited an arsenic exceedance as compared to the RIDEM Industrial/Commercial Direct Contact Criterion.

In September 1992, groundwater samples were collected from wells GT-301 to GT-307, except for well GT-306, which was dry. One sample from each well was screened with a FID and analyzed for BTEX. GT-301 was also analyzed for VOCs. A composite sample from GT-301 and GT-302 was analyzed for SVOCs, PCBs, and metals. The following results were observed:

- The groundwater from well GT-305 exhibited a benzene concentration of 8.3 ppb vs. the 5 ppb RIDEM drinking water Maximum Contaminant Level (MCL); and
- The remaining wells exhibited BETX concentrations below their respective MCLs and aggregate VOC concentrations less than 4 ppb.

Wells GT-301 through GT-307 were gauged monthly from their installation to determine if NAPL appeared in the wells. As of 1995, no NAPL had been detected. However, gauging of these wells in November 1998 suggests that these wells exhibit 0.01 to 0.07 feet (0.12 inches to 0.84 inches) of NAPL.

- Environmental Site Investigation - Tank Farm 3 [1995]

In 1994, in response to the recommendations of the Final Initial Assessment Study, GZA Inc. conducted a Site Investigation at Tank Farm 3 to assess the extent of petroleum product in soil and groundwater at the facility. This investigation program included:

- the installation of 16 monitoring wells;
- the screening and analysis of soil samples collected during the drilling;
- the collection and analysis of 22 groundwater samples from the new and existing wells; and
- the collection and analysis of 3 surface water samples from Lawton Brook.

In October and November 1994, monitoring wells GZ-301 TO GZ-316 were installed. To the extent feasible, the boring locations were selected to obtain soil and groundwater samples from areas down-gradient of the USTs and from selected areas of potential concern (see Figure 2-2). During the drilling, soil samples were collected at five-foot intervals. These samples were screened for VOCs with a PID and a FID. One sample from each boring (the one with the highest reading) was submitted for analysis for TPH, TVPH, and VOCs. Also, the sample from boring GZ-314, was analyzed for PCBs. The results of the analysis indicated:

- Boring GZ-309 and GZ-310, from the area of the surficial spill, exhibited TPH concentrations of 800 and 3,200 ppm, and TVPH concentrations of 41 and 45 ppm. The individual VOC concentrations for these two samples were less than 310 ppb.
- Boring GZ-303 near Tank 32 (and the oil/water separator) at a depth of 17 to 19 feet (below the water table) exhibited a TPH concentration of 130 ppm, a TVPH concentration of 0.35 ppm, and less than 5 ppb of VOCs.
- The remaining samples exhibited TPH concentrations less than 55 ppm, TVPH concentrations less than 0.06 ppm, and no detectable levels of VOCs.

In January 1995, groundwater samples were collected from wells GT-301 through GT-307 (except for GT-306 which was dry) and wells GZ-301 through GZ-316. All samples were analyzed for TPH, TVPH, and VOCs. The sample from the well down-gradient of the outdoor transformer, GZ-314, was analyzed for PCBs. The results of the analyses indicated:

- Well GZ-310 (located down-gradient of the surficial spill) contained NAPL and exhibited a TPH concentration of 4,100 ppm, a TVPH concentration of 53,000 ppm, and the highest VOC concentration of 67 ppb naphthalene.
- Well GZ-307 (Tank 34) exhibited a TPH concentration of 18 ppm, a TVPH concentration of 9.6 ppm, and contained VOCs ranging from 4.6 to 7 ppb.
- Well GZ-311 (Tank 36) exhibited a TPH concentration of 5.1 ppm and a benzene concentration of 10 ppb, which exceeded the RIDEM GA Groundwater Objective of 5 ppb.
- The remaining wells exhibited TPH concentrations less than 2 ppm (range 0.26 to 1.7 ppm), TVPH concentrations ranging from 0.016 ppm to 0.51 ppm, and VOC concentrations ranging from 1 ppb to 10 ppb. Eight of the 22 wells (GZ-302, GZ-303, GZ-307, GZ-309, GZ-310, GZ-311, GT-302, and GT-310) exhibited some VOC detection.
- No PCBs were detected in GZ-314.

During this investigation, three surface water samples (SW-1, SW-2, and SW-3) were collected from Lawton Brook. These samples were analyzed for TPH, TVPH, and VOCs. The results indicated that

chlorinated VOCs were found in all 3 samples at concentrations ranging from 2 to 18 ppb. GZA indicated the identified VOCs were not typically associated with the fuels stored at the site and suggested they were from an off-site upgradient source.

From this investigation, GZA concluded:

- A separate phase of floating petroleum product was present on the groundwater table in an area associated with a surficial spill of the early 1980s, northeast of Tank 35. GZA recommended installing additional monitoring wells in the vicinity of this surficial spill to further evaluate the extent of soil and groundwater contamination in the area.
- Two other areas of groundwater contamination exist down-gradient of Tanks 34 and 36. In these areas, levels of TPH from 5 to 18 ppm and levels of VOCs less than 17 ppb were detected in groundwater. The groundwater from one monitoring well location, down-gradient of Tank 36, slightly exceeded the GA Groundwater Objective for benzene. GZA recommended installing additional monitoring wells down-gradient of these locations to further evaluate the extent of soil and groundwater contamination in the areas.

- Supplemental Site Investigation - Tank Farm 3 [1996]

In 1995, GZA conducted a Supplemental Site Investigation to further evaluate the soil and groundwater conditions in the vicinity of the early 1980s surficial spill, and down-gradient of Tanks 34 and 36. The program included:

- the drilling of 10 shallow soil borings;
- the installation of 12 groundwater monitoring wells; and
- the collection, screening and analysis of soil and groundwater samples.

Borings B-1 through B-10 and wells GZ-317 through GZ-328 were installed within the known extent of the surficial spill, near Tank 36, or surrounding Tank 34 (Figure 2-2). During the drilling, soil samples were taken at five-foot intervals and screened using a FID and a PID. Thirty-eight samples were submitted for TPH analysis. (Thirty-seven of these samples were from the soil borings located in the proximity of the early 1980s spill and the remaining sample was from well GZ-323, down-gradient of Tank 34.) The six samples generally exhibiting the highest PID and FID readings (i.e., B-1, B-2, B-6, B-10, GZ-323, and GZ-328) were also analyzed for VOCs and PAHs. The results of the analyses indicated:

- Borings B-1 (0-2' and 5-7') and B-2 (0-2'), from the area of the surficial spill, exhibited TPH concentrations greater than 1,000 ppm, compared to the RIDEM Residential Direct Contact standard of 500 ppm. Boring B-1 (5-7') also exhibited aggregate VOC and aggregate PAH concentrations of 137 ppm and 71 ppm, respectively.
- Borings B-5 and B-6 exhibited TPH concentrations of 350 to 940 ppm, and Boring GZ-323 (near Tank 34) exhibited a TPH concentration of 470 ppm.
- The remaining samples exhibited TPH concentrations less than 200 ppm, aggregate VOCs less than 0.3 ppm, and aggregate PAHs less than 3 ppm.

In January 1996, groundwater was sampled from wells GT-301 through GT-307 (except GT-306 which was dry) and GZ-301 through GZ-328. All of the samples were analyzed for PAHs. Also, wells GZ-307 (Tank 34), GZ-311 (Tank 36), and GZ-317 through GZ-328 were analyzed for VOCs, TPH and TVPH. The results of the analyses indicated:

- Wells GZ-310 and the nearby GZ-318 and GZ-325 (surficial spill) contained NAPL. GZ-318 and GZ-325 contained TPH at concentrations ranging from 200 to 230 ppm.
- Well GZ-323 (Tank 34) contained NAPL. Also, wells GZ-320 through GZ-322 exhibited low TVPH levels, from 0.16 to 0.80 ppm.
- Well GZ-311 and GZ-317 (Tank 36) did not contain concentrations of compounds greater than RIDEM GA Objectives.
- Well GZ-304 (Tank 33) indicated product thickness in the range of 0.3 to 0.15 feet and did not show any detection of PAHs.
- PAHs were detected in wells GZ-310, GZ-318, and GZ-325 from within the surficial spill, and GZ-323 near Tank 34. The aggregate PAH concentrations ranged from 133 to 1,100 ppb for these samples.
- TVPH was detected in 12 of the wells. Wells GZ-318, GZ-323, and GZ-325 contained TVPH concentrations ranging from 110 to 390 ppm, while the other 9 wells were less than 4.8 ppm.
- Low levels of VOCs were detected in wells GZ-318, GZ-323, GZ-324, and GZ-325. The aggregate VOC concentrations ranged from 18 to 262 ppb. Tetrachloroethene was detected in GZ-323 at a concentration of 5.4 ppb.

From this investigation, GZA concluded:

- NAPL was present in four separate and distinct areas of the site:
  - Near the early-1980s surficial spill (at GZ-310 and GZ-325) at thicknesses of 0.01 to 0.6 feet;
  - Down-gradient of the spill and fuel distribution line (at GZ-318) (less than 0.02 feet);
  - Down-gradient of Tank 33 (at GZ-304) with floating product thicknesses of 0.01 to 0.2 feet; and
  - Down-gradient of Tank 34 (at GZ-323) at thicknesses of 0.01 to 0.06 feet.
- Groundwater samples from the wells with NAPL exhibited high TPH and TVPH concentrations, low VOC concentrations, and slightly elevated PAH concentrations (with respect to RIDEM standards).
- Low levels of TVPH were present in the groundwater throughout most of the remainder of the tank farm. However, elevated levels of individual VOCs and PAHs were not present in these areas.
- Elevated levels of TPH soil contamination (greater than 1,000 ppm) were detected in the shallow soil samples collected in the vicinity of the surficial spill (between B-1 and B-2). In addition, one of the soil samples collected from this area exhibited elevated VOC and PAH concentrations. The depth of this soil contamination was apparently less than 9 feet and the length and width of this area was estimated to be 30 by 80 feet.
- It was GZA's opinion that the installed monitoring well network had adequately defined the extent of floating product contamination in the vicinity of the surficial spill and in the area of Tank 34, but not in the area of Tank 33 (GZ-304) and GZ-318. GZA, therefore, recommended a CAP be prepared to address the separate phase of petroleum product contamination at the site and the elevated TPH soil contamination. The preparation of the CAP required a pump test. GZA recommended this pump test and the installation of

additional wells down-gradient of Tank 33 and the underground fuel pipeline (in the vicinity of GZ-318) to examine NAPL in these areas.

- Soil Gas Survey [1997]

A soil gas survey was performed from May 19 to May 22, 1997 to evaluate soil conditions near the underground distribution lines in Tank Farm 3. The soil gas probe locations were designated SG3-1 to SG3-27 (see Figure 2-2). Vapor samples were screened for VOCs using a PID and a FID instrument. Of the 27 samples collected, only two provided PID and/or FID responses above detection limits (0.1 ppm). SG3-10 exhibited a PID response of 1.2 ppm and SG3-25 exhibited a PID response of 0.8 ppm and a FID response of 0.3 ppm. These data were interpreted as not suggesting significant releases of product from pipelines.

- Supplemental Site Investigation and Corrective Action Plan – Tank Farm 3 [1998]

In 1997, GZA undertook a supplemental investigation to examine the area down-gradient of Tank 33 and in the vicinity of GZ-318. This investigation program included the installation of six monitoring wells (GZ-329 to GZ-335) and the collection of soil and groundwater samples (Figure 2-2). During the drilling, soil samples were taken at five-foot intervals and screened for total VOCs with a PID and FID. Four samples, GZ-329 through GZ-332, were analyzed for TPH, PAHs, and VOCs. TPH was detected in GZ-330 (down-gradient of Tank 33) at 27 ppm and TPH, VOCs, and PAHs were not detected in the remaining wells.

On June 10, 1997 groundwater samples were taken from wells GZ-329 through GZ-332. They were analyzed for VOCs , TVPH, and TPH. A low level VOC (butylbenzene at 1.6 ppb) and TVPH (0.12 ppm) were detected in well GZ-329 and the remaining wells did not have any detected compounds.

GZA performed an aquifer pump test to evaluate relevant hydrogeologic properties of the bedrock aquifer. The work included (1) the installation of a groundwater recovery well and three adjoining monitoring wells; (2) the performance of a specific capacity test; (3) the performance of a 24-hour pump test followed by a 24-hour recovery test; and (4) analytical testing of the pumped groundwater. On June 16 and 17 of 1997, recovery well RW-301 was installed down-gradient of GZ-310 (Figure 2-2). This area represents the area where the thickest NAPL had been observed. In addition, it is in the immediate area of the early 1980s overfilling incident at Tank 35. Soil samples were taken at five-foot intervals and screened for total VOCs with a FID and PID. Three groundwater monitoring wells were also installed in proximity of RW-301 to facilitate measurements of water levels during the pump test.

GZA performed a short-duration specific capacity test on well RW-301 on June 25, 1997. The test involved pumping the well at various rates and recording the associated drawdown in the well. The well was pumped at a rate of 1.2 gallons per minute (gpm) for the first hour of the test, 2.4 gpm for the second hour, and then 4.3 gpm for the remainder of the test. The specific capacity data was plotted and revealed the short term safe yield of the well to be approximately 2 gpm and that this flow is apparently derived from the upper 11 feet of the water table. Little, if any, additional yield was observed when the drawdown exceeded 11 feet.

A 24-hour pump test was performed followed by a 24-hour recovery test between June 30 and July 2, 1997. The test was performed by pumping groundwater from RW-301 and recording the water level response in the surrounding monitoring wells. The pumping rate was maintained at a rate of approximately 2.1 gpm throughout the test. The water level data was recorded in 12 monitoring wells located within a 200-foot radius of the pump test well, and in background monitoring well GZ-314. The water levels were recorded frequently (i.e., once per minute) at the beginning of the test, and less

frequently thereafter. Plots of drawdown versus time and distance versus drawdown for the monitoring wells located within 120-feet of RW-301 revealed that the 2-gpm extraction rate caused a significant depression in the water table. The drawndown in these monitoring wells at the completion of the pump test generally ranged from 1 to 9 feet. As expected, the drawdown in the monitoring wells closet to RW-301 was generally greater than in the wells further away. A noticeable exception was in wells GZ-326 and GZ-327, where drawdown was significantly less than in wells located at similar distances from the pumping well. These data demonstrate that the bedrock has significant heterogeneity in some areas of the site.

After the completion of the pump test, a groundwater sample was collected from RW-301. It was analyzed for VOCs, SVOCs, hydrocarbon fingerprinting, TVPH, total iron and manganese, total suspended solids, and pH. No VOCs, PAHs, or TPH were detected. TVPH was estimated to be present at a level below the detection limit. Iron was detected at 11.5 ppm, and manganese at 2.2 ppm. A thin layer of NAPL (0.01 foot) was noted in the well during the test. Wells GZ-333 through GZ-335 also exhibited a thin layer of NAPL (0.01 foot) at this time.

This aquifer pump test demonstrated that pumping the groundwater from RW-301 at a rate of 2 gpm will cause a capture zone extending at least 100 feet laterally from the well. The water level response in nearby monitoring wells GZ-326 and GZ-327 was not as significant as other wells, but both these wells are located hydraulically upgradient of RW-301. GZA believes that the data demonstrates that RW-301 is appropriately situated to recover floating product in that area of the site. However, only 0.01 feet of the floating product accumulated in the recovery well during the pump test and the thicket product measured in the surrounding monitoring wells during the pump test was only 0.03 feet.

Based on the findings of this test, it was GZA's opinion that the low aquifer transmissivity of the bedrock at Tank Farm 3 significantly contributes to the apparent immobility of the separate phase product at the site. The product, where present, is most likely trapped in the highly weathered and fractured bedrock. Secondly, the results of the product thickness measurements indicated that although separate phase product is intermittently present in certain monitoring wells, it does not presently appear to be available in significant enough quantity to be recoverable during pumping. In addition, soil contaminated by the previous surficial fuel release from Tank 35 appears to be confined to an area between borings B-1 and B-2. Therefore, GZA developed a CAP that allowed for the collection of floating product that may occasionally appear in certain monitoring wells at Tank Farm 3 and the excavation of TPH contaminated soil in the area where a previous surficial release of fuel oil occurred.

- Tank Closure Assessment Report – Tank Farm 3 [1998]

Tank Farm 3 tank closure activities were conducted between August and December of 1996. Before the tanks were cleaned, representative samples were collected from all seven tanks for waste characterization. Most of the tanks were found to contain minimal amounts of JP-8 and JP-5 fuel oil and water.

After the removal of residual fuels and water, each tank was cleaned with a water soluble, biodegradable degreaser. The surfaces of each tank were washed with water after allowing the degreaser to penetrate. The washwater, sludge, oil, and other debris generated during cleaning was removed via pumps and vacuum trucks. Sandblasted grit was also generated when the epoxy coating of Tank 69 was blasted to facilitate its inspection. Also, along with cleaning the tanks, all accessible appurtenances associated with each tank (i.e., pumps, interior pipelines, and vaults) were cleaned.

Upon completion of the cleaning activities, each tank was inspected by a marine chemist to certify that each tank was "gas and oil free, safe for workers and hot work, and environmentally safe for closure". Each tank received this certification. Along with these gas free inspections, structural inspections were

also performed. These structural inspections were limited to the interior surfaces of the tank shell and bottom, due to inaccessibility (buried) of the exterior structures. The structural assessment revealed several cracks present on the floor of Tank 35 and groundwater was seen seeping through pinholes in the floor seam of Tank 69 into the tank.

In addition to cleaning and inspecting the tanks at Tank Farm 3, the fuel distribution pipelines associated with each tank and the transfer pipe loop were permanently decommissioned. The piping was accessed, purged, water washed, and flushed by propelling a Styrofoam plug with compressed air or nitrogen. The interior of the pipes were screened with a PID and an explosivity meter (LEL) for the presence of residual VOCs. The cleaning procedures were repeated in sections of the pipes where monitoring readings exceeded 25 ppm on the PID and 0.0% LEL. After completion of the pipeline cleaning, openings used to access and the clean the pipes were grouted and a blank flange was attached to prevent reuse.

The ring drain system was not cleaned or decommissioned. This cleaning and closure of the ring drains can only be accomplished after the decommissioning and reballasting of the tanks.

Based on the information and data obtained during the performance of the Tank Closure Assessment, GZA had the following conclusions and recommendations:

- Tanks 32 through 36, 69, and 70 were emptied and cleaned. No petroleum product has been stored in these tanks since they were cleaned.
- At the time of GZA's departure, water was observed in some of the tanks. Groundwater appears to be reentering the tanks through cracks or other structural deficiencies noted in the tank structural reports.
- If the tanks in Tank Farm 3 are not to be reused, they should be permanently decommissioned using procedures approved by RIDEM.
- Upon completion of the decommissioning and ballasting of the tanks, the ring drain system at Tank Farm 3 should be permanently closed.
- The separator associated with the ring drain system should be accessed, cleaned, and removed upon permanent decommissioning of the ring drain system.

- Results of Groundwater Sampling for Fuel Loading Area and Tank Farms 1, 2, and 3 [1999]

In June 1999, Foster Wheeler sampled monitoring wells GT-303 through GT-305, and GZ-302, GZ-303, GZ-305, GZ-309, GZ-314, GZ-315, GZ-316, GZ-318, GZ-319, GZ-322, GZ-325, GZ-326, GZ-327, GZ-328, and GZ-330. All wells were sampled for TPH, VOCs, and SVOCs. Well GZ-302 was also analyzed for total metals. The results of the analysis were:

- NAPL was measured in wells GZ-304, GZ-310, GZ-325, and GZ-335, at 0.01, 0.02, 0.03, 0.03 feet respectively.
- TPH concentrations were detected in all wells, at concentrations ranging from 0.1 to 81 ppm.
- Low level VOCs, ranging from 3 to 68 µg/l, were detected in wells GZ-309, GZ-318, GZ-325, and GZ-327.
- Seventeen out of the 18 wells sampled exhibited detectable levels of some SVOCs. GZ-325 contained naphthalene (115 µg/l) above the RIDEM GA Groundwater Objective of 20 µg/l.
- No exceedances of the RIDEM GA Groundwater Objectives for metals were seen in GZ-302.

- Tank Farm 3 Soil Removal Activities in the Vicinity of Tank 35 [2000]

The focus of this action was the removal of contaminated soil above RIDEM Method 1 Residential Direct Exposure Criteria in the area adjacent to Tank 35 where fuel was reportedly released onto the ground surface in the early 1980s. Samples from boring and groundwater wells in the vicinity of this tank have shown the presence of TPH and NAPL. The most consistent product level thickness detected on the groundwater table were in the vicinity of monitoring well GZ-310. NAPL has also been detected in wells GZ-335 and GZ-310 during the groundwater sampling event in 1999.

Well GZ-309 was removed to facilitate the excavation around Tank 35. On September 2, 1999, Foster Wheeler began excavation on the east side of Tank 35 where borings had indicated high TPH concentrations. An area approximately 30' x 70' x 10' deep was excavated and bedrock was encountered at 10 feet below grade. Approximately 1,200 cubic yards of soil were removed.

Soil samples were taken from the side wall and bottom of the excavated area for field screening of TPH using a Petroflag™ kit. Exceedances were noted in the north and south side walls closest to the tank, the east side wall, and the excavation floor closest to the tank. On October 6, 1999, an additional 650 cubic yards of soil was removed from the north and south walls, and the bottom of the excavation where the screening kits indicated exceedances of TPH (see Figure 3-1). Additional soil could not be removed due to the presence of the road, north of the excavation. To confirm that the limits of contaminated soil had been reached, several test pits were dug in the vicinity of Tank 35 beyond the prior limits of excavation. Soil was inspected for signs of visible contamination and odor, and soil headspace readings were taken with a hydrocarbon vapor meter. No visible or olfactory contamination was observed and all the headspace readings were non-detect.

Confirmatory samples were then collected from the side walls and bottom of excavation after the field screening indicated TPH concentrations were below established criteria (see Figure 3-1). These samples were analyzed for total metals and SVOCs, while a few other samples closest to the tank were additionally analyzed for VOCs and TPH. Analysis indicated that TPH concentrations were below RIDEM Industrial/Commercial Direct Exposure Criteria in all samples except SS01. This sample was taken at a depth of 14 feet bgs and therefore further investigation was not practical. Also, exceedances of the RIDEM Industrial/Commercial Direct Exposure standards for arsenic were present in all samples, suggesting elevated background levels of this metal in the soil at Tank Farm 3.

- Closure Report for Underground Storage Tanks at Tank Farm 3 [2001]

Foster Wheeler performed the following work at Tank Farm 3 between October and December of 2000 in accordance with the approved Draft Work Plan for Closure of Underground Storage Tanks, Tank Farms 1, 2, and 3 (June, 1999):

- Drained, emptied, cleaned, and repaired seven tanks;
- Marine Chemist certified the tanks; and
- Re-inspected all of the fuel distribution piping and cleaned, as necessary.

Each of the tank's contents were pumped out into an above ground temporary on-site storage tank. The interior roof, walls, and floors of each tank were then cleaned with a high pressure wash and then the floors were wiped dry and the rinse water collected for disposal. After each tank was cleaned, it was inspected for any signs of deterioration and/or water or petroleum infiltration through the tank walls or floor. Areas identified as points of infiltration or future points of groundwater infiltration were repaired. Tanks were also inspected by a Marine Chemist and all were certified as suitable for closure in accordance with RIDEM UST closure criteria and the National Fire Prevention Association guidelines.

The Marine Chemist's findings for Tanks 35, 36, 69, and 70 were verified by RIDEM officials on November 9 and December 1, 2000 when they entered these tanks.

The fuel distribution piping associated with Tank Farm 3 was also inspected with this tank closure. Foster Wheeler re-verified that the piping was cleaned and decommissioned. If a part of the piping contained residual liquids, elevated combustible gases, or VOCs, that part of the pipe was cleaned. Once the piping was determined to be clean, a Marine Chemist performed an inspection at either end of each pipe section to certify that it met the appropriate criteria. The Marine Chemist certified that the piping was acceptable for closure.

3.4 Previous Response Actions/Closure Activities

The following activities have been conducted in order to facilitate closure of Tank Farm 3.

3.4.1 Soil Removal

As previously discussed, soil removal has occurred near Tank 35. The focus of this action was the removal of contaminated soil above RIDEM Method 1 Residential Direct Exposure Criteria in the area adjacent to Tank 35 where fuel was reportedly released onto the ground surface in the early 1980s. Samples from boring and groundwater wells in the vicinity of this tank have shown the presence of TPH and NAPL. On September 2, 1999, Foster Wheeler began excavation on the east side of Tank 35 where borings had indicated high TPH concentrations. Approximately 1,200 cubic yards of soil were removed. On October 6, 1999, an additional 650 cubic yards of soil was removed from the north and south walls, and the bottom of the excavation where screening kits indicated exceedances of TPH (see Figure 3-1). Additional soil could not be removed due to the presence of the road, north of the excavation. To confirm that the limits of contaminated soil had been reached, several test pits were dug in the vicinity of Tank 35 beyond the prior limits of excavation. Soil was inspected for signs of visible contamination and odor, and soil headspace readings were taken with a hydrocarbon vapor meter. No visible or olfactory contamination was observed and all the headspace readings were non-detect. Confirmatory samples were then collected from the side walls and bottom of excavation after the field screening indicated TPH concentrations were below established criteria (see Figure 3-1). These samples were analyzed for total metals and SVOCs, while a few other samples closest to the tank were additionally analyzed for VOCs and TPH. Analysis indicated that TPH concentrations were below RIDEM Industrial/Commercial Direct Exposure Criteria in all samples except SS01. This sample was taken at a depth of 14 feet bgs and therefore further investigation was not practical. Also, exceedances of the RIDEM Industrial/Commercial Direct Exposure standards for arsenic were present in all samples, suggesting elevated background levels of this metal in the soil at Tank Farm 3.

Based on this excavation, the area associated with the Tank 35 spill has been investigated and the CAP has been implemented. Due to the constraint of the tank, it is not feasible to remove the product that remains in this area.

3.4.2 Free Liquid Removal

GZA performed an aquifer pump test to evaluate relevant hydrogeologic properties of the bedrock aquifer and to determine the feasibility of recovering the NAPL. Based on the findings of this test, it was GZA's opinion that the low aquifer transmissivity of the bedrock at Tank Farm 3 significantly contributes to the apparent immobility of the separate phase product at the site. The product, where present, is most likely trapped in the highly weathered and fractured bedrock. Secondly, the results of the product thickness measurements indicated that although separate phase product is intermittently present in certain monitoring wells, it does not presently appear to be available in significant enough quantity to be

recoverable during pumping. In addition, soil contaminated by the previous surficial fuel release from Tank 35 appears to be confined to an area between borings B-1 and B-2.

Based on this assessment and other unsuccessful attempts made, the residual NAPL is not recoverable and it is not feasible to perform additional remediation. The NAPL appears to be localized and not migrating, due to the site hydrogeology. Each well that exhibited NAPL is bounded by several other wells that suggest this localized condition.

3.4.3 Tank Cleaning/Closure

Tank Farm 3 tank closure activities were conducted between August and December of 1996. After the removal of residual fuels and water, each tank was cleaned with a water soluble, biodegradable degreaser. The surfaces of each tank were washed with water after allowing the degreaser to penetrate. The washwater, sludge, oil, and other debris generated during cleaning was removed via pumps and vacuum trucks. Sandblasted grit was also generated when the epoxy coating of Tank 69 was blasted to facilitate its inspection.

Upon completion of the cleaning activities, each tank was inspected by a marine chemist to certify that each tank was "gas and oil free, safe for workers and hot work, and environmentally safe for closure". Each tank received this certification. Along with these gas free inspections, structural inspections were also performed. These structural inspections were limited to the interior surfaces of the tank shell and bottom, due to inaccessibility (buried) of the exterior structures. The structural assessment revealed several cracks present on the floor of Tank 35 and groundwater was seen seeping through pinholes in the floor seam of Tank 69 into the tank.

Closure activities also took place between October and December of 2000. Each of the tank's contents were pumped out into an above ground temporary on-site storage tank. The interior roof, walls, and floors of each tank were then cleaned with a high pressure wash and then the floors were wiped dry and the rinse water collected for disposal. After each tank was cleaned, it was inspected for any signs of deterioration and/or water or petroleum infiltration through the tank walls or floor. Areas identified as points of infiltration or future points of groundwater infiltration were repaired. Tanks were also inspected by a Marine Chemist and all were certified as suitable for closure in accordance with RIDEM UST closure criteria and the National Fire Prevention Association guidelines.

3.4.4 Pipeline Cleaning/Closure

All accessible appurtenances associated with each tank (i.e., pumps, interior pipelines, and vaults) were cleaned along with the tanks between August and December of 1996. The fuel distribution pipelines associated with each tank and the transfer pipe loop were permanently decommissioned. The piping was accessed, purged, water washed, and flushed by propelling a Styrofoam plug with compressed air or nitrogen. The interior of the pipes were screened with a PID and an explosivity meter (LEL) for the presence of residual VOCs. The cleaning procedures were repeated in sections of the pipes where monitoring readings exceeded 25 ppm on the PID and 0.0% LEL. After completion of the pipeline cleaning, openings used to access and the clean the pipes were grouted and a blank flange was attached to prevent reuse.

The ring drain system was not cleaned or decommissioned. This cleaning and closure of the ring drains can only be accomplished after the decommissioning and reballasting of the tanks.

Between October and December of 200, the fuel distribution piping associated with Tank Farm 3 was also inspected with the tank closure. Foster Wheeler re-verified that the piping was cleaned and decommissioned. If a part of the piping contained residual liquids, elevated combustible gases, or VOCs, that part of the pipe was cleaned. Once the piping was determined to be clean, a Marine Chemist performed an inspection at either end of each pipe section to certify that it met the appropriate criteria. The Marine Chemist certified that the piping was acceptable for closure.

4.0 CONCEPTUAL SITE MODEL

As mentioned previously, a CSM was constructed for Tank Farm 3 (Figure 4-1). A CSM is an integrated description of how people and potential ecological receptors could come into contact with contaminants at the site. The CSM has four main objectives, as follows:

- Identify the potential **sources** of the chemicals of potential concern (COPCs) and the likely distribution of the COPCs in the environmental media at the site;
- Identify the **mechanisms** by which the COPCs may move between environmental media and be transported through the environment;
- Identify the populations of **human and ecological receptors** that could come into contact with the affected media; and
- Identify the **routes of intake** (such as incidental ingestion of the soil or groundwater) by which the populations may be exposed.

The CSM was used as the basis for evaluating environmental site management options and identifying corresponding data needs.

4.1 Primary Sources

As shown in the first column of Figure 4-1, several known or suspected primary sources are located throughout Tank Farm 3. Primary sources include:

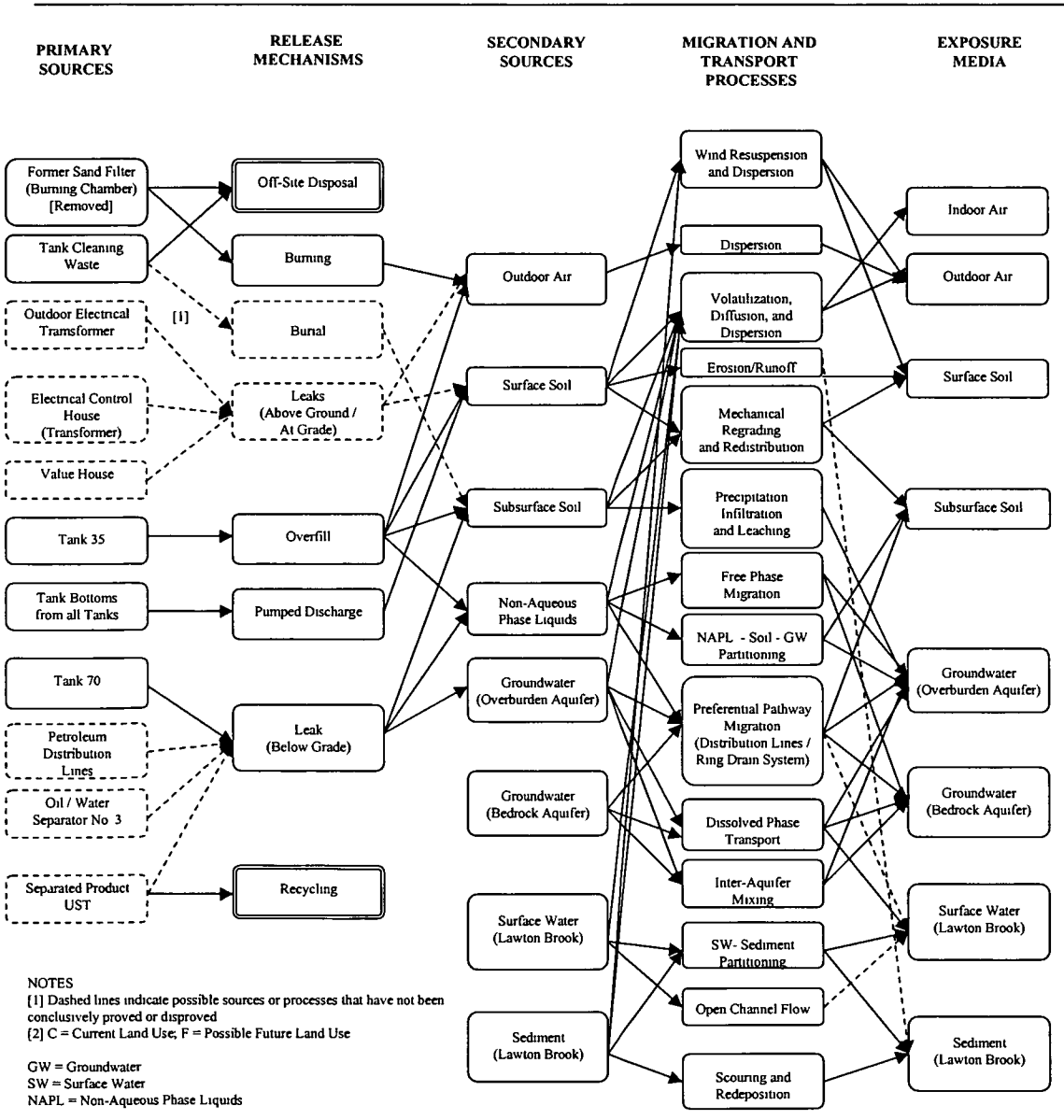
- the former sand filter area;
- the tank cleaning waste;
- the freestanding outdoor electrical transformer;
- the electrical control house;
- the valve house;
- the underground storage tanks and the associated underground petroleum distribution lines;
- the underground ring drains and associated drainage system; and
- the current oil/water separator with 5,000 gallon collection UST.

4.2 Secondary Sources

Releases from the primary sources may enter the surrounding soil or groundwater that may then serve as secondary sources of the constituents. Releases from the primary sources are possible due to leaks, spills, overfills, and other activities that occurred as part of routine tank farm operations. Also, a few known releases have been documented. These releases include: the seepage of product from Tank 70, the overfill and surficial spill from Tank 35 in the early 1980s, and the disposal and seepage of tank bottoms and sludge from the sand filter and USTs. Possible secondary sources at Tank Farm 3 are shown in Figure 4-1 and are discussed below.

Releases from the tanks, distribution lines and valve system, such as the product seepage from Tank 70 and the 1980s overfilling incident, may have resulted in contamination of the soils and possibly groundwater in the proximity of these facilities. Depending on the lateral extent of the spread of the free product, the backfilled trenches containing the existing product transfer and drainage system pipelines may have become impacted.

FIGURE 4-1
CONCEPTUAL SITE MODEL FOR THE TANK FARM 3 PROPERTY



NOTES
[1] Dashed lines indicate possible sources or processes that have not been conclusively proved or disproved
[2] C = Current Land Use; F = Possible Future Land Use

GW = Groundwater
SW = Surface Water
NAPL = Non-Aqueous Phase Liquids

INTAKE ROUTES	POTENTIAL -> RECEPTORS -> [2]	C / - Site Worker	C / - Controlled-Access Visitor	- / F Groundskeeper	- / F Construction Worker	- / F Visitors	C/ F Ecological (Terrestrial)	C / F Ecological (Aquatic)	
Inhalation of Volatiles		X							
Inhalation of Particulates		X	X	X	X	X	X		
Inhalation of Volatiles		X	X	X	X	X	X		
Incidental Ingestion		X		X	X	X	X		
Dermal Absorption		X	X	X	X	X	X		
Inhalation of Particulates		X	X	X	X	X	X		
Inhalation of Volatiles		X	X	X	X	X	X		
Incidental Ingestion				X	X		X		
Dermal Absorption				X	X		X		
Inhalation of Particulates				X	X				
Inhalation of Volatiles				X	X		X		
Ingestion									
Incidental Ingestion		X			X				
Dermal Absorption		X			X				
Inhalation of Volatiles					X				
Ingestion									
Incidental Ingestion									
Dermal Absorption									
Inhalation of Volatiles					X		X		
Ingestion								X	
Incidental Ingestion		X					X		
Dermal Absorption		X	X				X	X	
Ingestion								X	
Incidental Ingestion		X					X		
Dermal Absorption		X					X	X	

The ring drains and associated drainage system prior to 1974 were believed to discharge into the former sand filter, and the filtered water to discharge into Narragansett Bay. (It should be noted, the ring drain system may have also formed a preferential pathway for material released in the vicinity of the tanks.) These discharges, as well as past disposal practices, such as placing tank bottoms and sludges into the former sand filter may have resulted in the contamination of shallow and deeper subsurface soils, and groundwater in this area. Some soil was reportedly excavated when the sand filter was taken out of service and replaced by the current oil/water separator. The extent of the excavation and the degree of any residual impacted soil are unknown.

4.3 Migration and Transport Mechanisms

Once in the environment, various migration and transport mechanisms are likely to act to disperse and redistribute the contaminants remaining at Tank Farm 3. The CSM identifies potential migration and transport mechanisms for the constituents at Tank Farm 3. These mechanisms are shown in Figure 4-1 and are discussed below.

Contaminants that are present in the outdoor air from various release mechanisms may be transported throughout the outdoor air by dispersion. Contaminants present in the soil may migrate to the indoor or outdoor air by wind resuspension and dispersion or volatilization, diffusion, or dispersion. Contaminants in the soil may migrate throughout the soil by erosion or runoff, mechanical regrading and redistribution, or precipitation, infiltration, and leaching. Contaminants in the soil may move through the soil and into the groundwater via precipitation, infiltration, and leaching. Contaminants present in the soil may also find their way to the sediment in Lawton Brook by erosion or runoff.

Contaminants in NAPL may move into the groundwater via free phase migration, NAPL-Soil-Groundwater partitioning, or by preferential pathway migration (distribution lines / ring drain system). Contaminants in NAPL could also be transported to the subsurface soil by NAPL-Soil-Groundwater partitioning. Contaminants in the groundwater may be transported throughout the groundwater by preferential pathway migration (distribution lines / ring drain system), dissolved phase transport, or inter-aquifer mixing. In any of these cases, if materials were to be transported with the groundwater (dissolved phase transport) to locations where groundwater breaks out locally into the wetland area or banks of Lawton Brook, released contaminants could find their way to surface water and sediments. Surface water could then flow toward Narragansett Bay (open channel flow), carrying dissolved or suspended contaminants with it. Contaminants in the surface water or sediment could be transported throughout Lawton Brook by surface water-sediment partitioning or, for the sediment, by scouring and redeposition. Surface water and sediment contaminants may also enter the outdoor air by volatilization, diffusion, and dispersion. Sediment contaminants may also enter the air, or surface soil, through wind resuspension and dispersion.

4.4 Potential Human and Ecological Receptors

The CSM identifies potential human and ecological populations that may be at risk of exposure to the chemicals remaining at Tank Farm 3. These populations depend on how the property is used now and in the future. Below, current and potential future land uses are discussed, and the potentially exposed populations associated with these land uses are identified.

Current Human Receptors. Currently, the property is an inactive petroleum fuel tank farm. The majority of the site is fenced and locked, and access to the area is controlled by DESC. Individuals occasionally visit the site, generally in the context of the ongoing tank closure or site clean-up activities. Therefore, the populations at current risk of exposure are adult site workers or controlled-access visitors who could be exposed during their time on-site. However, the duration of visits and the intensity of a

visitors' interaction with the potentially impacted site media are typically much less than that of a site worker, and the visitor would be expected to experience significantly less potential for exposure than the site worker.

Potential Future Human Receptors. In the future, the site is likely to be developed into a golf course. This scenario is considered limited access. This development would require excavation and regrading of the site. Therefore, the populations that may be at risk of exposure to contaminants that may remain at Tank Farm 3 include the construction workers and groundskeepers who would excavate and regrade the site and the future visitors using the golf course.

Potential Ecological Receptors. The majority of the Tank Farm 3 property is a fenced-in area that contains the USTs, their associated support structures and utilities, and the area's access roads. This area is largely grass covered and open. Wooded areas are located in a strip along the southeastern fenceline, away from the central tank area, and in lesser density around the perimeter of the fenced-in portion of the Tank Farm 3 area. This area appears to be providing suitable habitat for typical grassland or meadow species, including small mammals, rodents, and the hawks that prey on them. Deer are also common inside the fence in or near the wooded area bordering Lawton Brook, as they are able to jump the enclosing fence. The portion of the site outside the fence includes Lawton Brook (which is dammed and can create a small freshwater reservoir), the adjacent wetlands, and wooded areas. Standing water is not always present in the lower (northwestern) end of Lawton Brook behind the dam. While these areas were not surveyed to establish the types and number of aquatic and terrestrial species present, this area appears to provide high quality habitat for a diversity of species. This is likely to include invertebrate and benthic species, fish and amphibians, deer, piscivorous mammals, and birds. The plant life in this area is comprised primarily of wetland species along Lawton Brook and backwater areas, and typical grassland and wooded upland species.

4.5 Potential Intake Routes

The current site workers and controlled-access visitors, potential future construction workers and groundskeepers, potential future visitors, and terrestrial or aquatic ecological receptors could come into contact with the contaminants in the soil, groundwater, air, surface water, or sediment at Tank Farm 3 in a number of ways. These intake routes are shown in Figure 4-1 and discussed below.

Current Exposure Routes. Site workers at Tank Farm 3 could contact the contaminants in soil through direct contact with the soil, incidental ingestion, and inhalation of airborne dust generated during the closure and cleanup activities. These types of exposures are likely to occur with surface soils or shallow soils (less than 10 feet below grade) that might be exposed during excavation and construction activities. Direct contact with deeper soils is considered unlikely given the depths of the structures and utilities that would be the focus of the construction activities. Site workers may also be exposed to chemicals in the groundwater via limited contact with the local groundwater during excavation work and be exposed by incidental ingestion of or dermal contact with groundwater. Similarly, this type of exposure is expected to be limited to within 10 feet of the ground surface. Site workers also may come into contact with the chemicals in the groundwater if the workers were to accidentally or purposefully ingest the water. However, at the present time there are no groundwater wells at the facility and any appreciable exposure to groundwater by incidental ingestion is not considered likely to occur.

Site workers may also be exposed to chemicals in the soils or groundwater if the chemicals were to volatilize and accumulate inside of a structure or a trench, where they could be inhaled. The structures on site that are associated with petroleum distribution, such as the tanks, are being removed or decommissioned. Due to the past use, workers will need to consider the potential for accumulation of vapors in these structures until the operations are complete. Exposure to accumulations of vapors in an

open trench are expected to be minimal due to the effects of diffusion and dispersion in the atmosphere. However, due to the nature of the site and the remedial work that is being conducted, the workers should as a precaution consider the potential for this accumulation.

Visitors that are onsite currently have controlled access. By walking around the site, they may be exposed to the contaminants in the outdoor air, soil, or surface water. Inhalation of particulates or volatiles may occur from any contaminants in the outdoor air or in the soil. Dermal contact with the soil may also expose these visitors to contaminants. Due to the presence of Lawton Brook, exposure to the surface water by dermal contact may also occur.

Future Exposure Routes. In the future, the populations at risk of exposure are construction workers, groundskeepers, and future visitors. These populations may contact the chemical in the soils and groundwater by the same pathways listed above. Specifically, the construction worker could contact chemicals in soil through direct contact with soil, incidental ingestion, or inhalation of volatile and particulate borne contaminants during construction activities. Also, the construction worker excavating or working in a confined trench or subsurface structure could be exposed to the chemicals in the soils and groundwater if the chemicals were to volatilize from the underlying soils and groundwater and be inhaled. Lastly, the construction worker could come into limited contact with the local groundwater during excavation work and be exposed by incidental ingestion of or dermal contact with groundwater. The direct contact pathways are likely to occur only with the shallow soils and groundwater. The inhalation exposures may occur as a result of shallow or deep soil and groundwater contamination.

In the future, groundskeepers and visitors may also be exposed via the pathways above. Specifically, they may contact chemicals in the soil through direct contact, incidental ingestion, or inhalation of windblown dust. Although these pathways are considered to occur, in the case of golf course development, the area would be landscaped and realistically the opportunity for extensive contact would be minimal for the visitors. For the groundskeeper, the opportunity for exposure would be greater due to the amount of contact with the soil during landscaping activities.

Ecological Exposure Routes. Terrestrial ecological receptors would be exposed to contaminants in the surface and subsurface soil via multiple routes of intake. Ecological exposures via the inhalation of volatile chemicals emitted from subsurface NAPL or contaminated groundwater may be anticipated, as would exposures to the contaminated surface water or sediment via incidental ingestion or dermal absorption. Ecological receptors in the Lawton Creek wetland may also be exposed to any contaminants potentially present via surface water or sediment uptake or dermal absorption.

5.0 ENVIRONMENTAL STATUS OF POTENTIAL SOURCE AREAS

Potential source area evaluations for Areas of Potential Environmental Concern (AOPECs) that have been previously addressed are provided in Appendix A. These areas include:

- Tank 69
- Tank 70
- Tank 32
- Tank 33
- Tank 34
- Tank 36
- Electrical Control House
- Petroleum Distribution Lines

The soil borings and groundwater wells associated with Tank Farm 3 provide the data necessary to evaluate these sources areas. By examining each source area evaluation (i.e., soil boring data, groundwater data, and NAPL data), current conditions at the site were identified. The soil data was compared to RIDEM Industrial/Commercial Direct Exposure Criteria and the GA Leachability Criteria, while the groundwater data was compared to the GA Groundwater Objectives. Since any presence of NAPL is considered a condition that exceeds the Upper Concentration Limits, NAPL detection was also reviewed. The following sections describe the current status of the site by media.

5.1 Potential Source Areas Adequately Addressed

5.1.1 Soil

The most recent data from each soil boring were compared to the RIDEM Method 1 Industrial/Commercial Direct Exposure and GA Leachability Criteria. An exceedance of the Direct Exposure Criteria occurred with a composite sample that was taken in 1992 near Tanks 69 and 70. The composite sample results exhibited a level of arsenic (6 mg/kg) that was above the Direct Exposure Criterion. Other exceedances occurred at two locations, GZ-310 and B-1, taken in 1994 and 1995, respectively. Both exhibited TPH levels that exceeded the Industrial/Commercial Direct Exposure Criterion. Figure 5-1 depicts the location of all soil samples taken at Tank Farm 3 and these exceedances. The excavation that took place near Tank 35 due to the surficial spill is another area at the site where these criteria were exceeded for soil. Figure 3-1 shows these exceedances and their locations.

5.1.2 Groundwater

Since the groundwater onsite is classified as GA-NA, the groundwater data that has been collected was compared to the RIDEM GA Groundwater Objectives. Groundwater has been collected most recently in some of the wells at Tank Farm 3 in 1999 by Foster Wheeler. Well GZ-302 exhibited a lead exceedance in 1999, GZ-309 exhibited an exceedance of bis(2-ethylhexyl)phthalate (BEHP) in 1999, GZ-311 exhibited a benzene exceedance in 1995, GZ-318 exhibited a naphthalene exceedance in 1996 and an exceedance of BEHP in 1999, GZ-325 exhibited naphthalene exceedances in 1996 and 1999 and an exceedance of BEHP in 1999, GZ-330 exhibited an exceedance of BEHP in 1999, GZ-310 exhibited naphthalene exceedances in 1995 and 1996, GZ-304 exhibited a naphthalene exceedance in 1997, and GZ-323 exhibited exceedances of tetrachloroethene and naphthalene in 1996. Five of these wells (GZ-302, 309, 318, and 325) were last sampled in 1999, two (GZ-304 and 311) were last sampled in 1997, and one (GZ-310) was last sampled in 1996. Therefore, these concentrations may not be representative of what is currently found in these wells. Also, future sampling will address BEHP since it is a common lab contaminant. Figure 5-2 depicts the locations of all of the groundwater monitoring wells and any detected concentrations and exceedances of the RIDEM GA Groundwater Objectives.

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

P. E. SEALS

Date: AUGUST 2002
Scale: AS SHOWN
Designed by: –
Drawn by: C. POTVIN
Checked by: –
Approved by: –

FOSTER WHEELER ENVIRONMENTAL CORPORATION
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TANK FARM 3
SITEWIDE SOIL SAMPLING RESULTS

GT-306

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
9/92	0–1	TOULENE	0.024

GZ-313

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	5–8 4	TPH	ND
		VOCs	ND
		TVPH	ND

GZ-328

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
12/95	0–2	VOCs	ND
		PAHs	NO
		TPH	NO

GZ-326

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/95	0–2	TPH	14
	5–7	TPH	ND
	9–11	TPH	ND

GT-305

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
9/92	13 5–15 5	TOULENE	0.011

GZ-311

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	0.2–2.2	TPH	53
		VOCs	ND
		TVPH	ND

GT 301–307 COMPOSITE

DATE	CHEMICAL	CONCEN(mg/kg)
9/92	TOLUENE	0.025
	HEXANE	0.007
	TRIMETHYLBENZENE	0 005
	ALUM	7000
	ARSENIC	6
	BARIUM	34
	CALCIUM	970
	CHROMIUM	14
	COBALT	9
	COPPER	11
	IRON	19000
	LEAD	9
	MAGNESIUM	2100
	MANGANESE	340
	NICKEL	19
	POTASSIUM	650
	SODIUM	64
	VANADIUM	15
	ZINC	47

B-6

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
12/95	0–2	TPH	ND
	5–7	TPH	940
		ISOPROPYLBENZENE	0.0091
		N–PROPYLBENZENE	0 019
		1,3,5 TRIMETHYLBENZENE	0 064
		1,2,4 TRIMETHYLBENZENE	0.11
		SEC–BUTYLBENZENE	0.023
		P–ISOPROPYLTOLUENE	0 047
		NAPHTHALENE	0.017
		2–METHYLNAPHTHALENE	1
		1–METHYLNAPHTHALENE	1.6
	10–12	TPH	540

GZ-331

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
4/97	0–2	VOCs	ND
		PAHs	ND
		TPH	ND

GZ-329

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
3/97	5–7	VOCs	ND
		PAHs	NO
		TPH	NO

GT-307

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
9/92	8–10	TOULENE	0.010

GT-301

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
9/92	13.5–15.5	TOULENE	0.026
		ETHYLBENZENE	0.041
		XYLENE	0 110

GT-304

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
9/92	13 5–15.5	TOULENE	0 012

GT-303

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
9/92	3.5–5 55	BTEX	ND

GZ-316

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	5–7	TPH	ND
		VOCs	ND
		TVPH	0.06

B-7

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
12/95	0–2	TPH	43
	5–7	TPH	ND
	10–12	TPH	ND

GZ-302

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
9/92	8 5–10 5	TOULENE	0.019

GZ-312

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	15–17	TPH	ND
		VOCs	ND
		TVPH	ND

GZ-310

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	10–12	TPH	3200
		1,2,4–TRIMETHYLBENZENE	0 25
		NAPHTHALENE	0.140
		N–PROPYLBENZENE	0 100
		1,3,5 TRIMETHYLBENZENE	0.310
		SEC–BUTYLBENZENE	0 12
		P–ISOPROPYLTOLUENE	0 23
		ETHYLBENZENE	0 015
		XYLENES	0.027
		ISOPROPYLBENZENE	0 065
		TVPH	45

GZ-302

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	5–7	TPH	ND
		VOCs	ND
		TVPH	ND

B-8

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
12/95	0–2	TPH	ND
	5–7	TPH	ND

B-5

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
12/95	0–2	TPH	31
	5–7	TPH	450
	10–12	TPH	350

B-10

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
12/95	0–2	TPH	ND
	5–7	TPH	ND
		PAHs	ND
		VOCs	ND
	10–12	TPH	ND

GZ-327

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/95	0–2	TPH	ND
	5–7	TPH	ND

GZ-303

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	17–19	TPH	130
		VOCs	ND
		TVPH	0.35

GZ-315

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	5–7	TPH	ND
		VOCs	ND
		TVPH	ND

GZ-324

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/95	0–2	TPH	ND
	5–7	TPH	ND
	8–10	TPH	ND

B-4

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
12/95	0–2	TPH	ND
	5–7	TPH	ND

B-9

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
12/95	0–2	TPH	ND
	5–7	TPH	ND
	10–12	TPH	ND

B-2

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
12/95	0–2	TPH	1800
		NAPHTHALENE	0 038
		PAHs	ND
	5–7	TPH	ND
	10–12	TPH	ND

GZ-306

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	0–2	TPH	ND
		VOCs	ND
		TVPH	ND

GZ-308

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	10–12	TPH	ND
		VOCs	ND
		TVPH	ND

B-3

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
12/95	0–2	TPH	190
	5–7	TPH	86
	10–12	TPH	ND

GZ-309

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	3–4	TPH	800
		SEC–BUTYLBENZENE	0.005
		P–ISOPROPYLTOLUENE	0.014
		TVPH	41

GZ-301

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	0.2–2 2	TPH	28
		VOCs	ND
		TVPH	ND

GZ-332

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
3/97	5–8	TPH	ND
		VOCs	ND
		PAHs	ND

GZ-330

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
3/97	5–7	TPH	27
		VOCs	ND
		PAHs	ND

GZ-304

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	0–2	TPH	24
		VOCs	ND
		TVPH	ND

GZ-305

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	0–2	TPH	ND
		VOCs	ND
		TVPH	ND

GZ-307

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	5–7	TPH	ND
		VOCs	ND
		TVPH	0.06

GZ-323

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/95	5–7	1,3,5–TRIMETHYLBENZENE	0 007
		P–ISOPROPYLTOLUENE	0.0067
		NAPHTHALENE	0.034
		TPH	470
		PAHs	ND

B-1

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
12/95	0–2	TPH	1500
	5–7	TPH	4100
		ETHYLBENZENE	3.3
		XYLENE	7.2
		ISOPROPYLBENZENE	3
		N–PROPYLBENZENE	7.3
		1,3,5–TRIMETHYLBENZENE	25
		1,2,4–TRIMETHYLBENZENE	61
		SEC–BUTYLBENZENE	7.3
		P–ISOPROPYLTOLUENE	6.6
		NAPHTHALENE	43
		2–METHYLNAPHTHALENE	28
		1–METHYLNAPHTHALENE	30
	10–12	TPH	390

GZ-314

DATE	DEPTH	CHEMICAL	CONCEN(mg/kg)
11/94	0–2	TPH	ND
		VOCs	ND
		PCB/PEST	ND
		TVPH	ND

LEGEND:

- SW-3 — SURFACE WATER SAMPLING LOCATION
- GT-301 — MONITORING WELLS INSTALLED FOR GROUNDWATER TECHNOLOGY (SEPTEMBER OF 1992)
- B-3 — TEST BORINGS PERFORMED BY GZA DRILLING, INC. BETWEEN DECEMBER 5 AND 7, 1995, OBSERVED BY GZA PERSONNEL
- GZ-301 — BORINGS PERFORMED AND MONITORING WELLS INSTALLED BY GZA DRILLING, INC BETWEEN OCTOBER 1994 AND APRIL 1997, OBSERVED BY GZA PERSONNEL
- RW-301 — PUMP TEST WELL INSTALLED BY D.L. MAHER DRILLING COMPANY BETWEEN JUNE 16 AND 17, 1997, OBSERVED BY GZA PERSONNEL
- SG3-15 — SOIL GAS SAMPLING
- TANK 33 — UNDERGROUND STORAGE TANK

ABBREVIATIONS

NS	NOT SAMPLED
ND	NOT DETECTED
TPH	TOTAL PETROLEUM HYDROCARBONS
TVPH	TOTAL VOLATILE PETROLEUM HYDROCARBONS
VOCs	VOLATILE ORGANIC COMPOUNDS
SVOCs	SEMI–VOLATILE ORGANIC COMPOUNDS
PBCs	POLYCHLORINATED BIPHENYLS
PEST	PESTICIDES
PAHs	POLYAROMATIC HYDROCARBONS

NOTES:

1. BASE PLAN WAS DERIVED AND DIGITIZED BY FOSTER WHEELER ENVIRONMENTAL CORPORATION IN MAY 1999 FROM DRAWING ENTITLED "DFSC/TANK FARM 3 – SITE PLAN", PROJECT NO. 31288.9, FIGURE NO. 1, CAD FILE: TANK–3 DWG, VIEW TANK3–LARGE, DATED JANUARY 1998, BY GZA ENVIRONMENTAL, INC.
2. ORIGINAL BASE PLAN WAS DEVELOPED FROM A PLAN PROVIDED BY NAVAL FACILITIES ENGINEERING COMMAND ENTITLED "NAVAL COMPLEX NEWPORT, R.I. MELVILLE (SOUTH)", ORIGINAL SCALE 1"=400', DRAWING NO. 944,208
3. THE LOCATIONS AND ELEVATIONS OF THE BORINGS WERE APPROXIMATELY DETERMINED BY SURVEY FROM EXISTING TOPOGRAPHIC AND MAN–MADE FEATURES. THE LOCATIONS OF THE TANKS WERE DETERMINED BY PACING FROM EXISTING TOPOGRAPHIC FEATURES. THE LOCATIONS OF THE UTILITY LINES WERE INTERPOLATED FROM A PLAN ENTITLED "FUEL DISTRIBUTION SYSTEM STORAGE TANKS 32–36, 69 & 70 AREA II PLOT PLAN", BY J.M. McCUSKER CO., DATED JUNE 11, 1954, DRAWING NO Y&D# 627332, ORIGINAL SCALE 1"=50'. THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
4. HIGHLIGHTED CHEMICALS INDICATE EXCEEDANCE OF RIDEM COMMERCIAL/INDUSTRIAL DIRECT CONTACT CRITERIA.

0 100 200
SCALE IN FEET

PROJECT NO:

CADD FILE NO:
10060000_A001.DWG

DRAWING NO.
FIGURE 5-1
SHEET 1 OF 1

0015419B01X

GZ-318		
DATE	CHEMICAL	CONCEN(ug/L)
1/96	ETHYLBENZENE	2.6
	M-P-XYLENE	3.6
	1,3,5 TRIMETHYLBENZENE	22
	P-ISOPROPYLTOLUENE	38
	TVPH	160,000
	NAPHTHALENE(PAHs)	**140**
	2-METHYLNAPHTHALENE	380
	1-METHYLNAPHTHALENE	440
	PHENANTHRENE	140
	TPH	200,000
6/99	TPH	81000
	ACETONE	6J
	ETHYLBENZENE	17
	1,3,5 TRIMETHYLBENZENE	12
	SEC-BUTYLBENZ	30
	N-BUTYLBENZ	63
	1,2,4 TMB	14
	NAPHTHALENE(VOCs)	13
	P-ISOPROPYL TOLUENE	68
	NAPHTHALENE(SVOCs)	17J
	2-METHYLNAPHTHALENE	24J
	PHENANTHRENE	41J
	ANTHRACENE	11J
	FLUORANTHENE	110
	PYRENE	55
	CHRYSENE	17J
	BIS(2-ETHYLHEXYL)PHTHALATE	**87**
	BENZO(A)ANTHRACENE	19J
	BENZO(K)FLUORANTHENE	14J

GZ-331		
DATE	CHEMICAL	CONCEN(ug/L)
6/97	VOCs	ND
	TVPH	ND
	TPH	ND

GZ-328		
DATE	CHEMICAL	CONCEN(ug/L)
1/96	VOCs	ND
	TVPH	ND
	PAHs	ND
	TPH	ND
6/99	TPH	150
	VOCs	ND
	BIS(2-ETHYLHEXYL)PHTHALATE	4J

GZ-329		
DATE	CHEMICAL	CONCEN(ug/L)
6/97	SEC-BUTYLBENZENE	1.6
	TVPH	120
	TPH	ND

GZ-326		
DATE	CHEMICAL	CONCEN(ug/L)
1/96	VOCs	ND
	TVPH	1,100
	PAHs	ND
	TPH	ND
6/99	TPH	450
	VOCs	ND
	BIS(2-ETHYLHEXYL)PHTHALATE	2J

GZ-305		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	5100
	MTBE	2
	BENZENE	**10**
	ISOPROPYLBENZENE	1.1
	SEC-BUTYLBENZENE	2.4
	TVPH	160
1/96	VOCs	ND
	PAHs	ND
	TVPH	ND
	TPH	ND
9/97	SEC-BUTYLBENZENE	2.9
	PAHs	ND
	TPH	ND

GZ-317		
DATE	CHEMICAL	CONCEN(ug/L)
1/96	VOCs	ND
	VHC	0.43
	PAHs	ND
	TPH	ND

GZ-313		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	ND
	VOCs	ND
	TVPH	ND
1/96	PAHs	ND
8/97	P-ISOPROPYLTOLUENE	1.6
	PAHs	ND
	TPH	ND

RW-301		
DATE	CHEMICAL	CONCEN(ug/L)
7/97	VOCs	ND
	TVPH	ND
	SVOCs	ND
	TPH	ND
	IRON	11,500
	MANG	2,220

GZ-307		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TVPH	ND
	VOCs	ND
1/96	PAHs	ND

GZ-311		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	5100
	MTBE	2
	BENZENE	**10**
	ISOPROPYLBENZENE	1.1
	SEC-BUTYLBENZENE	2.4
	TVPH	160
1/96	VOCs	ND
	PAHs	ND
	TVPH	ND
	TPH	ND
9/97	SEC-BUTYLBENZENE	2.9
	PAHs	ND
	TPH	ND

GZ-301		
DATE	CHEMICAL	CONCEN(ug/L)
1/98	PAHs	ND
1/95	TPH	ND
	VOCs	ND
	TVPH	ND
8/97	VOCs	ND
	PAHs	ND
	TPH	ND

GZ-304		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TVPH	ND
	VOCs	ND
	TPH	ND
1/96	PAHs	ND
6/99	TPH	530
	VOCs	ND
	BIS(2-ETHYLHEXYL)PHTHALATE	1J
	PCB/PEST	ND

GZ-303		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TVPH	ND
	VOCs	ND
	TPH	ND
1/96	PAHs	ND
6/99	TPH	260
	DIETHYLPHTHALATE	2J
	DI-N-BUTYLPHTHALATE	2J
	BIS(2-ETHYLHEXYL)PHTHALATE	4J
	VOCs	ND

GZ-302		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TVPH	180
	1,2-DICHLOROETHANE	1.0
	TPH	ND
1/96	PAHs	ND

GZ-312		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	ND
	VOCs	ND
	TVPH	ND
1/96	PAHs	ND

GZ-325		
DATE	CHEMICAL	CONCEN(ug/L)
1/96	ETHYLBENZENE	3.5
	M-P-XYLENE	1.5
	1,3,5 TRIMETHYLBENZENE	1.9
	NAPHTHALENE(VOCs)	**27**
	TVPH	390,000
	NAPHTHALENE(PAHs)	**110**
	2-METHYLNAPHTHALENE	250
	1-METHYLNAPHTHALENE	410
	TPH	200,000
6/99	TPH	73000
	ISOPROPYLBENZENE	3J
	N-PROPYLBENZENE	3J
	SEC-BUTYLBENZENE	5
	N-BUTYLBENZENE	5J
	1,2,4 TRIMETHYLBENZENE	4J
	NAPHTHALENE(VOCs)	9
	NAPHTHALENE(SVOCs)	**115**
	2-METHYLNAPHTHALENE	105
	BIS(2-ETHYLHEXYL)PHTHALATE	**300**

GZ-316		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	ND
	VOCs	ND
	TVPH	ND
1/96	PAHs	ND
6/99	TPH	380
	VOCs	ND
	BIS(2-ETHYLHEXYL)PHTHALATE	2J

GZ-323		
DATE	CHEMICAL	CONCEN(ug/L)
1/96	**TETRACHLOROETHENE**	**6.4**
	ETHYLBENZENE	3.7
	ISOPROPYLBENZENE	5.5
	N-PROPYLBENZENE	9.3
	1,3,5 TRIMETHYLBENZENE	69
	1,2,4 TRIMETHYLBENZENE	**74**
	SEC-BUTYLBENZENE	24
	P-ISOPROPYLTOLUENE	59
	NAPHTHALENE(VOC)	12
	TVPH	110,000
	NAPHTHALENE(PAHs)	**31**
	2-METHYLNAPHTHALENE	120
	1-METHYLNAPHTHALENE	150
	TPH	230,000
8/97	1,2,4 TRIMETHYLBENZENE	1.7
	P-ISOPROPYLTOLUENE	2.9
	PAHs	ND
	TPH	3,000

GZ-314		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	ND
	TVPH	ND
	VOCs	ND
	TPH	ND
1/96	PAHs	ND
6/99	TPH	780
	VOCs	ND
	SVOCs	ND
	PCB/PEST	ND

GZ-309		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	1,400
	ISOPROPYLBENZENE	1.3
	1,3,5 TRIMETHYLBENZENE	1.1
	SEC-BUTYLBENZENE	2.7
	TVPH	330
1/96	PAHs	ND
6/99	TPH	2500
	ACETONE	13
	BIS(2-ETHYLHEXYL)PHTHALATE	**14**

GZ-308		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	260
	VOCs	ND
	TVPH	19
1/96	PAHs	ND
7/97	VOCs	ND
	PAHs	ND
	TPH	ND

GZ-327		
DATE	CHEMICAL	CONCEN(ug/L)
1/96	VOCs	ND
	VHC	4,800
	PAHs	**ND**
	TPH	ND
6/99	TPH	840
	SEC-BUTYLBENZENE	5
	BIS(2-ETHYLHEXYL)PHTHALATE	2J

GZ-310		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	4,100,000
	NAPHTHALENE(VOCs)	**67**
	TVPH	53,000,000
1/96	**NAPHTHALENE(PAHs)**	**31**
	2-METHYLNAPHTHALENE	34
	1-METHYLNAPHTHALENE	68

GZ-315		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TVPH	ND
	VOCs	ND
	TPH	1,200
1/96	PAHs	ND
6/99	TPH	560
	VOCs	ND
	DIETHYLPHTHALATE	1J
	DI-N-BUTYLPHTHALATE	2J
	BIS(2-ETHYLHEXYL)PHTHALATE	3J

GZ-306		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	ND
	VOCs	ND
	TVPH	240
1/96	PAHs	ND

GZ-324		
DATE	CHEMICAL	CONCEN(ug/L)
1/96	ISOPROPYLBENZENE	1.8
	1,3,5 TRIMETHYLBENZENE	1.7
	1,2,4 TRIMETHYLBENZENE	2.3
1/96	SEC-BUTYLBENZENE	4
6/99	P-ISOPROPYLBENZENE	3.7
	NAPHTHALENE(VOCs)	4.1
	TVPH	2,300
	PAHs	ND
	TPH	ND

GZ-303		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	ISOPROPYLBENZENE	1.8
	N-PROPYLBENZENE	2.5
	1,3,5 TRIMETHYLBENZENE	2.2
	1,2,4 TRIMETHYLBENZENE	5.6
	SEC-BUTYLBENZENE	2.9
	TVPH	510
	TPH	520
1/96	PAHs	ND
6/99	TPH	530
	VOCs	ND
	DIETHYLPHTHALATE	1J
	BIS(2-ETHYLHEXYL)PHTHALATE	3J

GZ-301		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	ND
	VOCs	ND
	TVPH	ND
1/96	PAHs	ND

GZ-332		
DATE	CHEMICAL	CONCEN(ug/L)
6/97	CHLOROFORM	1.9
	TVPH	ND
	TPH	ND

GZ-330		
DATE	CHEMICAL	CONCEN(ug/L)
6/97	VOCs	ND
	TVPH	ND
	TPH	ND
6/99	TPH	890
	VOCs	ND
	NAPHTHALENE(SVOC)	3J
	DI-N-BUTYLPHTHALATE	2J
	BIS(2-ETHYLHEXYL)PHTHALATE	**8**

GZ-304		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	ND
	VOCs	ND
	TVPH	260
1/96	PAHs	ND
8/97	1,3,5 TRIMETHYLBENZENE	810
	1,2,4 TRIMETHYLBENZENE	690
	P-ISOPROPYLTOLUENE	1100
	NAPHTHALENE	**160**
	2-METHYLNAPHTHALENE	1300
	1-METHYLNAPHTHALENE	1000
	PHENANTHRENE	27
	TPH	2,400,000

GZ-305		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	1700
	VOCs	ND
	TVPH	69
1/96	PAHs	ND
6/99	TPH	720
	VOCs	ND
	BIS(2-ETHYLHEXYL)PHTHALATE	3J

GZ-320		
DATE	CHEMICAL	CONCEN(ug/L)
1/96	VOCs	ND
	TVPH	160
	PAHs	ND
	TPH	ND

GZ-321		
DATE	CHEMICAL	CONCEN(ug/L)
1/96	VOCs	ND
	TVPH	480
	PAHs	ND
	TPH	ND

GZ-307		
DATE	CHEMICAL	CONCEN(ug/L)
1/95	TPH	18,000
	1,3,5 TRIMETHYLBENZENE	4.6
	1,2,4 TRIMETHYLBENZENE	7
	TVPH	9,600
1/96	VOCs	ND
	TVPH	130
	PAHs	ND
	TPH	ND

GZ-322		
DATE	CHEMICAL	CONCEN(ug/L)
1/96	VOCs	ND
	VHC	800
	PAHs	ND
	TPH	ND
6/99	TPH	100
	VOCs	ND
	DIETHYLPHTHALATE	2J
	DI-N-BUTYLPHTHALATE	2J
	BIS(2-ETHYLHEXYL)PHTHALATE	2J
	PCB/PEST	ND

ABBREVIATIONS

NS	NOT SAMPLED
ND	NOT DETECTED
TPH	TOTAL PETROLEUM HYDROCARBONS
TVPH	TOTAL VOLATILE PETROLEUM HYDROCARBONS
VOCs	VOLATILE ORGANIC COMPOUNDS
SVOCs	SEMI-VOLATILE ORGANIC COMPOUNDS
PBCs	POLYCHLORINATED BIPHENYLS
PEST	PESTICIDES
PAHs	POLYAROMATIC HYDROCARBONS

LEGEND:

GROUND SURFACE CONTOUR (BASED ON MEAN LOW WATER DATUM)

SW-3 — SURFACE WATER SAMPLING LOCATION

GT-301 — MONITORING WELLS INSTALLED FOR GROUNDWATER TECHNOLOGY (SEPTEMBER OF 1992)

B-3 — TEST BORINGS PERFORMED BY GZA DRILLING, INC. BETWEEN DECEMBER 5 AND 7, 1995, OBSERVED BY GZA PERSONNEL

GZ-301 — BORINGS PERFORMED AND MONITORING WELLS INSTALLED BY GZA DRILLING, INC. BETWEEN OCTOBER 1994 AND APRIL 1997, OBSERVED BY GZA PERSONNEL

RW-301 — PUMP TEST WELL INSTALLED BY D L MAHER DRILLING COMPANY BETWEEN JUNE 16 AND 17, 1997, OBSERVED BY GZA PERSONNEL

SG3-15 — SOIL GAS SAMPLING

TANK 33 — UNDERGROUND STORAGE TANK

NOTES:

1. BASE PLAN WAS DERIVED AND DIGITIZED BY FOSTER WHEELER ENVIRONMENTAL CORPORATION IN MAY 1999 FROM DRAWING ENTITLED "DFSC/TANK FARM 3 – SITE PLAN", PROJECT NO 31288 9, FIGURE NO. 1, CAD FILE: TANK-3.DWG, VIEW TANK3-LARGE, DATED JANUARY 1998, BY GZA ENVIRONMENTAL, INC.
2. ORIGINAL BASE PLAN WAS DEVELOPED FROM A PLAN PROVIDED BY NAVAL FACILITIES ENGINEERING COMMAND ENTITLED "NAVAL COMPLEX NEWPORT, R I MELVILLE (SOUTH)", ORIGINAL SCALE 1"=400', DRAWING NO. 944,208.
3. THE LOCATIONS AND ELEVATIONS OF THE BORINGS WERE APPROXIMATELY DETERMINED BY SURVEY FROM EXISTING TOPOGRAPHIC AND MAN-MADE FEATURES. THE LOCATIONS OF THE TANKS WERE DETERMINED BY PACING FROM EXISTING TOPOGRAPHIC FEATURES. THE LOCATIONS OF THE UTILITY LINES WERE INTERPOLATED FROM A PLAN ENTITLED "FUEL DISTRIBUTION SYSTEM STORAGE TANKS 32-36, 69 & 70 AREA II PLOT PLAN", BY J.M. McCUSKER CO., DATED JUNE 11, 1954, DRAWING NO. Y&D# 627332, ORIGNAL SCALE 1"=50'. THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
4. HIGHLIGHTED CHEMICALS INDICATE EXCEEDANCE OF RIDEM GA GROUNDWATER OBJECTIVE.

0 100 200
SCALE IN FEET

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

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P. E. SEALS

Date: AUGUST 2002
Scale: AS SHOWN
Designed by: –
Drawn by: C. POTVIN
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DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

TANK FARM 3
SITEWIDE GROUNDWATER SAMPLING RESULTS

PROJECT NO.

CADD FILE NO:
10060000_A002.DWG

DRAWING NO.
FIGURE
5-2
SHEET 1 OF 1

5.1.3 Non-Aqueous Phase Liquids

According to RIDEM's *Remediation Regulations*, the presence of NAPL in any environmental medium is considered a condition that exceeds Upper Concentration Limits (UCLs). In June of 1999, 0.24 inches of NAPL was measured in well GZ-310. NAPL has been measured in this well since December of 1994. In this same area of the site, NAPL has also been measured in GZ-315 (0.12 inches; 3/95), GZ-325 (0.12 – 1.44 inches; 12/95 – 5/97), and GZ-335 (0.36 inches; 6/99). These wells are all near Tank 35 where the surficial spill took place in the early 1980s. In well GZ-304, near Tank 33, 0.21 inches of NAPL was measured in April of 2001. This well has a history of NAPL measurements since January of 1996. Figure 5-3 shows the locations that contain NAPL and relative thicknesses. Due to the presence of NAPL in wells GZ-310 and GZ-304 in their most recent gaugings, a condition exists which exceeds the UCL.

5.2 Potential Source Areas with Outstanding Questions/Issues

Based on the current status of the site and after investigative activities were implemented at the site, there are five remaining areas at Tank Farm 3 that are considered AOPECs to be evaluated. These areas and their reasons for environmental concern are detailed below. These source area evaluations are provided in Appendix B.

1. Sludge Pit – From talking with previous onsite personnel, it was determined that there is one tank cleaning waste disposal area onsite. The steel tanks (69 and 70) were cleaned and their tank cleaning wastes were routinely buried onsite. Figure 5-4 shows this potential burial area.
2. Former Sand Filter (Burn Pit) – According to onsite personnel, the sand filter, along with some of the surrounding soils, were reportedly removed from the site between the late 1960s and early 1970s. The sand filter consisted of a steel pit with sides that stuck above the ground surface. The tank bottoms from the concrete tanks (32-36) were placed in this pit and then they were burned. The pipe going to the burn pit was disconnected and by-passed upgrade to the oil water separator. Figure 5-4 shows the location of the sand filter.
3. Oil/Water Separator #3 / Collection UST – Because this separator had product associated with it, there is concern as to the impact on the environment. It is not known if the separator or UST leaked, was overfilled, or if a spill ever occurred. Figure 5-4 shows the area associated with the oil/water separator.
4. Outdoor Electrical Transformer – This transformer has been discussed previously with RIDEM personnel concerning PCB contamination. There has been one soil sample and the groundwater in well GZ-314 analyzed for PCBs. However, there is no other data to tell if there is PCB contamination nearby the transformer. There also is no information on leaks, PCB composition, or evidence of stressed vegetation nearby. Figure 5-4 shows the location of this transformer.
5. Valve House – This valve house contains an oil/water separator that separated the water from the oil coming into the tank farm, pumped the oil to the collection tanks onsite, and pumped the water to an oil/water separator downgradient of the valve house. There have been no samples taken by this structure and the presence of contamination is unknown. Figure 5-4 shows the location of the valve house.

In order to determine the extent of contamination, if any, at these five areas of concern, additional supplemental investigation is warranted.

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED

NOTES:

1. BASE PLAN WAS DERIVED AND DIGITIZED BY FOSTER WHEELER ENVIRONMENTAL CORPORATION IN MAY 1999 FROM DRAWING ENTITLED "DFSC/TANK FARM 3 – SITE PLAN", PROJECT NO. 31288.9, FIGURE NO. 1, CAD FILE: TANK-3.DWG, VIEW TANK3-LARGE, DATED JANUARY 1998, BY GZA ENVIRONMENTAL, INC
2. ORIGINAL BASE PLAN WAS DEVELOPED FROM A PLAN PROVIDED BY NAVAL FACILITIES ENGINEERING COMMAND ENTITLED "NAVAL COMPLEX NEWPORT, R.I. MELVILLE (SOUTH)", ORIGINAL SCALE 1"=400', DRAWING NO. 94420B.
3. THE LOCATIONS AND ELEVATIONS OF THE BORINGS WERE APPROXIMATELY DETERMINED BY SURVEY FROM EXISTING TOPOGRAPHIC AND MAN-MADE FEATURES. THE LOCATIONS OF THE TANKS WERE DETERMINED BY PACING FROM EXISTING TOPOGRAPHIC FEATURES. THE LOCATIONS OF THE UTILITY LINES WERE INTERPOLATED FROM A PLAN ENTITLED "FUEL DISTRIBUTION SYSTEM STORAGE TANKS 32-36, 69 & 70 AREA II PLOT PLAN", BY J.M. McCUSKER CO., DATED JUNE 11, 1954, DRAWING NO. Y&D# 627332, ORIGINAL SCALE 1"=50' THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
4. ONLY THOSE ANALYTES THAT EXCEED THE APPLICABLE DURING ONE OR MORE SAMPLING RESULTS ARE SHOWN.

DATE	ANALYTE	RESULT (ppb)
6/99	PB	16
5/97	PB	10

DATE	ANALYTE	RESULT (ppb)
–	VOC's	ND
–	SVOC's	ND
–	METHYL	ND

LEGEND:

- PIPING REQUIRED CLEANING
- PIPING NOT REQUIRING CLEANING
- B-3 / DO — DIESEL OIL LINE
- BSW — BOTTOM SEDIMENT & WATER LINE
- FENCE
- GT-301 — MONITORING WELLS INSTALLED FOR GROUNDWATER TECHNOLOGY (SEPTEMBER OF 1992)
- GZ-301 — BORINGS PERFORMED AND MONITORING WELLS INSTALLED BY GZA DRILLING, INC. BETWEEN OCTOBER 1994 AND APRIL 1997, OBSERVED BY GZA PERSONNEL
- RW-301 — PUMP TEST WELL INSTALLED BY D.L. MAHER DRILLING COMPANY BETWEEN JUNE 16 AND 17, 1997, OBSERVED BY GZA PERSONNEL
- TANK 33 — UNDERGROUND STORAGE TANK

0 100 200
SCALE IN FEET

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P. E. SEALS

Date: JULY 2002
Scale: AS SHOWN
Designed by: –
Drawn by: C. POTVIN
Checked by: –
Approved by: –

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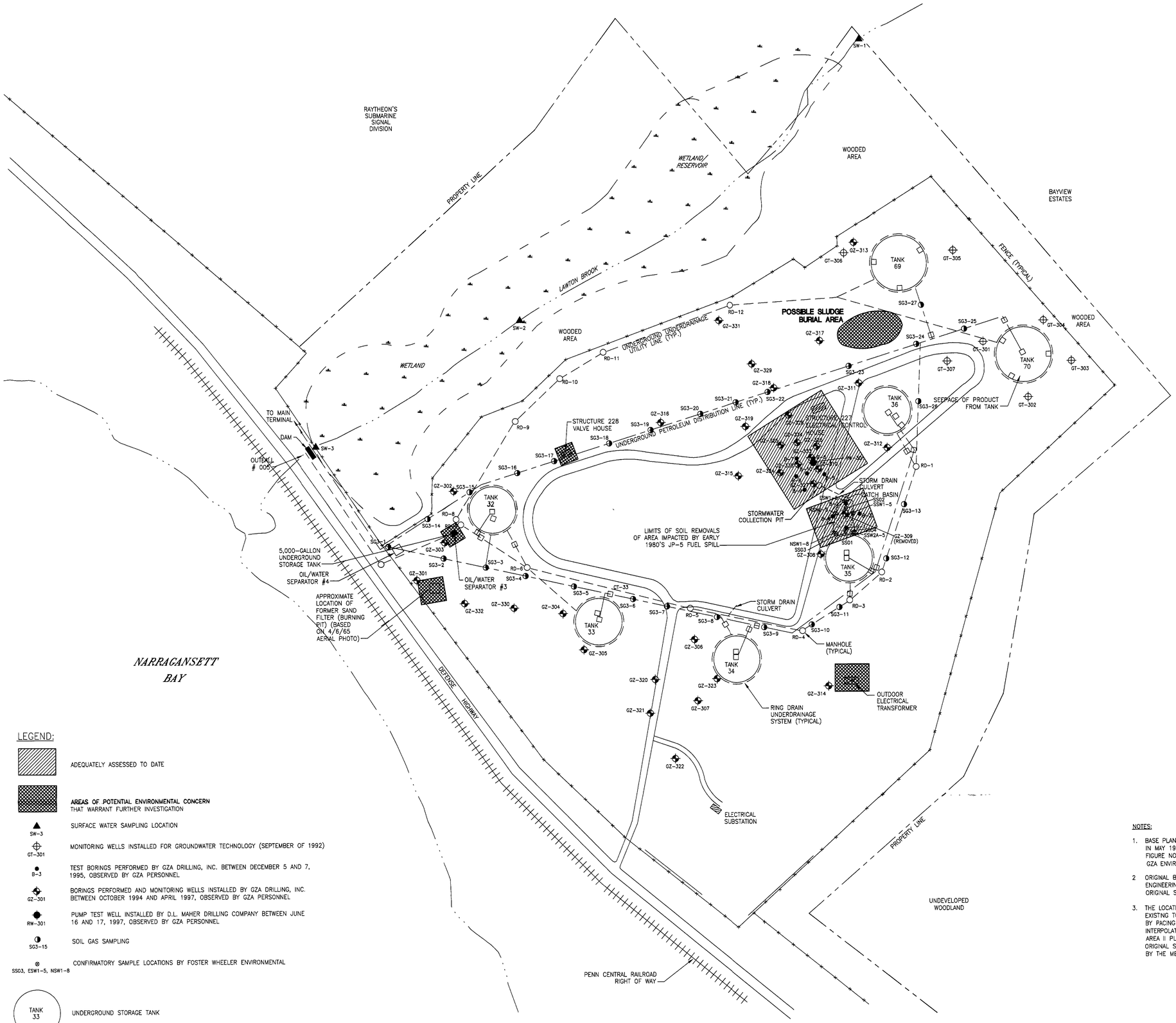
DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

TANK FARM 3
NON-AQUEOUS
PHASE LIQUID
MONITORING DATA

PROJECT NO: 2033.1008
CADD FILE NO: 10060000_A003.DWG
DRAWING NO. FIGURE 5-3
SHEET 1 OF 1

0015417B02X

REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVED



LEGEND:

- ADEQUATELY ASSESSED TO DATE
- **AREAS OF POTENTIAL ENVIRONMENTAL CONCERN** THAT WARRANT FURTHER INVESTIGATION
- SW-3 — SURFACE WATER SAMPLING LOCATION
- GT-301 — MONITORING WELLS INSTALLED FOR GROUNDWATER TECHNOLOGY (SEPTEMBER OF 1992)
- B-3 — TEST BORINGS PERFORMED BY GZA DRILLING, INC. BETWEEN DECEMBER 5 AND 7, 1995, OBSERVED BY GZA PERSONNEL
- GZ-301 — BORINGS PERFORMED AND MONITORING WELLS INSTALLED BY GZA DRILLING, INC. BETWEEN OCTOBER 1994 AND APRIL 1997, OBSERVED BY GZA PERSONNEL
- RW-301 — PUMP TEST WELL INSTALLED BY D.L. MAHER DRILLING COMPANY BETWEEN JUNE 16 AND 17, 1997, OBSERVED BY GZA PERSONNEL
- SG3-15 — SOIL GAS SAMPLING
- SS03, ESW1-5, NSW1-8 — CONFIRMATORY SAMPLE LOCATIONS BY FOSTER WHEELER ENVIRONMENTAL
- TANK 33 — UNDERGROUND STORAGE TANK

NOTES:

1. BASE PLAN WAS DERIVED AND DIGITIZED BY FOSTER WHEELER ENVIRONMENTAL CORPORATION IN MAY 1999 FROM DRAWING ENTITLED "DFSC/TANK FARM 3 – SITE PLAN", PROJECT NO 31288.9, FIGURE NO. 1, CAD FILE: TANK-3.DWG, VIEW TANK3-LARGE, DATED JANUARY 1998, BY GZA ENVIRONMENTAL, INC.
2. ORIGINAL BASE PLAN WAS DEVELOPED FROM A PLAN PROVIDED BY NAVAL FACILITIES ENGINEERING COMMAND ENTITLED "NAVAL COMPLEX NEWPORT, R.I MELVILLE (SOUTH)", ORIGINAL SCALE 1"=400', DRAWING NO. 944,208.
3. THE LOCATIONS AND ELEVATIONS OF THE BORINGS WERE APPROXIMATELY DETERMINED BY SURVEY FROM EXISTING TOPOGRAPHIC AND MAN-MADE FEATURES. THE LOCATIONS OF THE TANKS WERE DETERMINED BY PACING FROM EXISTING TOPOGRAPHIC FEATURES. THE LOCATIONS OF THE UTILITY LINES WERE INTERPOLATED FROM A PLAN ENTITLED "FUEL DISTRIBUTION SYSTEM STORAGE TANKS 32-36, 69 & 70 AREA II PLOT PLAN", BY J.M. McCUSKER CO., DATED JUNE 11, 1954, DRAWING NO. Y&D# 627332, ORIGINAL SCALE 1"=50'. THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

0 100 200
SCALE IN FEET

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P. E. SEALS

Date: AUGUST 2002
Scale: AS SHOWN
Designed by: –
Drawn by: C. POTVIN
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DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

TANK FARM 3
AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

PROJECT NO.

CADD FILE NO:
10060000_A004.DWG

DRAWING NO.
FIGURE 5-4
SHEET 1 OF 1

6.0 PROPOSED CLOSURE AND CLEAN-UP STRATEGY

DESC has been performing a coordinated program of site investigation and response activities at Tank Farm 3 for some time. Generally, this program of activities has included the following steps:

Step 1: Review the available data collected for the potentially impacted media at the site and compare the results to the appropriate default tank closure and clean-up requirements.

Step 2: Develop a CSM for Tank Farm 3 addressing any portion of the site that may be impacted by site contaminants.

Step 3: Identify the technical basis for the default closure and clean-up requirements and the required approach for demonstrating compliance with these criteria.

Step 4: Develop an initial Closure and Clean-Up Strategy (CCS) for each area indicated to be impacted by site constituents and any associated additional data requirement.

Step 5: Presentation of the CCS to RIDEM and follow-up discussion.

Step 6: Modification of the initial CCS based on the presentation and discussions.

This report, up to this point, documents the results of Steps 1 through 3. This section summarizes and presents the components of the initial CCS (Steps 4 and 5). The initial CCS is summarized below.

6.1 Free Phase Product

6.1.1 Findings

Trace amounts of free phase product are indicated to be present at a few monitoring well locations (e.g., in GZ-310 and adjacent wells near the known Tank 35 release, and in GZ-304 near Tank 33). The thickness of the free phase product measured at these locations has been on the order of ¼ inch (0.25 in). The hydrogeology at this site suggests that this product is trapped in the fractured bedrock and will not migrate further. The free-phase product is limited to these areas, not recoverable (based on several prior unsuccessful attempts), and is not accessible via direct contact to potential future receptors because of its depth (i.e., approximately 14 feet bgs). It is unclear from the RIDEM Remediation Regulations how much NAPL is consistent with the "presence" of NAPL (Remediation Regulations §8.07) relative to being considered a condition that exceeds UCLs.

6.1.2 CCS

Three wells have historically exhibited free phase petroleum hydrocarbons and one well continues to exhibit a layer of free liquid (< 0.05 feet). For this reason, DESC is petitioning RIDEM to establish a residual zone in the immediate vicinity of these wells. DESC proposes to then develop a long-term program to monitor the NAPL present at each of these locations.

The free-phase product remains a potential environmental concern primarily because of its possible impact on the local groundwater quality in this GA area. As such, DESC intends to also address any residual free-phase product in the context of the groundwater remediation strategy (see below).

6.2 Groundwater

6.2.1 Findings

A small number of contaminants have been detected at various points in the past above the RIDEM GA Groundwater Objectives. Based on the most recent sampling (1999), this list includes lead in one well and BEHP in four wells. Prior to 1999, sampling revealed exceedances of naphthalene (in five wells) and tetrachloroethene and benzene (each in one well). The boundary of the area in which an exceedance of a GA criterion is known or suspected has been identified based on the groundwater sampling results to date, the location of free phase product, and the understanding of the hydrogeology of the site.

The GA Groundwater Objectives represent groundwater concentrations that are suitable for drinking without treatment. There are currently no drinking water wells on the property and none are envisioned to be associated with the projected future use of the site as a golf course. The on-site groundwater is also not likely to be used for bathing. The area containing Tank Farm 3 is served by a public water supply. Given the nature of the contaminants exceeding the GA standards, there is no concern about future levels of volatiles in the indoor air of possible future buildings. There is also no indication that elevated groundwater levels are having any impact on an adjacent surface water body (i.e., Lawton Brook).

6.2.2 CCS

DESC intends to apply to the Director of RIDEM for a variance of the GA Groundwater Objectives for a well defined, internal portion of the property in accordance with §12.00 of the *Remediation Regulations*. DESC intends to present substantial evidence that the issuance of a variance would meet the conditions specified in §12.03. Appropriate institutional controls and an Environmental Land Use Restriction, consistent with §8.09 of the *Remediation Regulations*, will be designed and petitioned to RIDEM. This restriction will prohibit the withdrawal of groundwater for drinking purposes and disturbance of the specific areas of the site that exceed the applicable Criteria until such time as the groundwater may be shown to comply with the GA Groundwater Objectives. The restriction would not limit the use of the groundwater for watering the grass and for other landscaping needs. The concurrence of the owner of this property, the Navy, with this restriction will be documented in an Environmental Land Usage Agreement with RIDEM.

Due primarily to the lead, BEHP, and naphthalene exceedances of the GA Groundwater Objectives, a semi-annual groundwater monitoring program is proposed to ensure that the free phase and dissolved constituents of potential concern are not mobile. The monitoring program will be designed to demonstrate that the groundwater quality outside the identified boundary continues to meet the GA criteria over time. This boundary, representing an effective alternative point of compliance for the GA criteria, will in no case extend past the property boundary. The size of the area to be designated with a use restriction to preclude the withdrawal of groundwater for purposes of drinking will be minimized to the extent practical. Table 6-1 identifies the monitoring wells and target analyses proposed for this program. Figures 6-1 and 6-2 show groundwater contour maps of the site for May 2002 and July 2002, respectively.

Table 6-1
Proposed Monitoring Wells and Analyses for the Groundwater Monitoring Program

Monitoring Well	Analysis
GT-302	BTEX and Naphthalene, TPH
GZ-302	BTEX and Naphthalene, TPH
GZ-305	BTEX and Naphthalene, TPH
GZ-307	BTEX and Naphthalene, TPH
GZ-312	BTEX and Naphthalene, TPH
GZ-313	BTEX and Naphthalene, TPH
GZ-314	BTEX and Naphthalene, TPH
GZ-316	BTEX and Naphthalene, TPH
GZ-320	BTEX and Naphthalene, TPH
GZ-321	BTEX and Naphthalene, TPH
GZ-330	BTEX and Naphthalene, TPH
GZ-331	BTEX and Naphthalene, TPH

No active remediation of the groundwater at this site is planned, as it is considered to be infeasible due to the residual contamination remaining in the highly weathered bedrock.

6.3 Soil

6.3.1 Findings

Areas of known soil contamination have been previously addressed at Tank Farm 3 via excavation and off-site disposal. These include the area in the vicinity of Tank 35 (where a total of roughly 1,850 cy was excavated and removed under a CAP), and the location of the Former Sand Filter/Burn Pit (where soil was reported to have been excavated and disposed when that structure was removed). TPH was found to exceed the Residential and Industrial/Commercial Direct Exposure and GA Leachability Criteria in places in the excavated pit in the soil around Tank 35 at a depth of 14 feet bgs. This soil was impractical to remove.

Some other areas warranting further investigation have already been discussed with RIDEM. These include, but are no limited to:

- A Tank Cleaning Waste Disposal area (i.e., Sludge Pit);
- Former Sand Filter/Burn Pit;
- Oil/Water Separator #3;
- Outdoor Electrical Transformer; and
- Valve House.

Additional investigation in these areas of potential concern is indicated based on a number of justifications:

- There is anecdotal evidence of a release from past practices that has not been verified or shown to be inaccurate;
- The effectiveness of a prior removal was not well documented and is questioned; and
- The nature of past practices does not rule out the possibility of leaks or spills, and these occurrences have not been ruled out.

RAYTHEON'S SUBMARINE SIGNAL DIVISION

PROPERTY LINE

WETLAND/ RESERVOIR

LAWTON BROOK

SW-1

SW-2

SW-3

WETLAND

TO MAIN TERMINAL

DAM

OUTFALL # 005

5,000-GALLON UNDERGROUND STORAGE TANK

14' x 14' STRIPPER VALVE POINT

APPROXIMATE LOCATION OF FORMER SAND FILTER (BURNING PIT) (BASED ON 4/6/65 AERIAL PHOTO)

OIL/WATER SEPARATOR #3

BURNING PIT

NARRAGANSETT BAY

DEFENSE HIGHWAY

TANK 32

TANK 33

TANK 34

TANK 35

TANK 36

TANK 69

TANK 70

STRUCTURE 227 ELECTRICAL CONTROL HOUSE

STRUCTURE 228 SEPARATOR VALVE HOUSE

SEEPAGE OF PRODUCT FROM TANK

CATCH BASIN

STORM DRAIN CULVERT

MANHOLE (TYPICAL)

RING DRAIN UNDERDRAINAGE SYSTEM (TYPICAL)

OUTDOOR ELECTRICAL TRANSFORMER

FENCE (TYPICAL)

BAYVIEW ESTATES

UNDEVELOPED WOODLAND

PROPERTY LINE

60'

40'

30'

20'

0 200 400

SCALE IN FEET

LEGEND:

60' GROUNDWATER ELEVATION CONTOUR

INFERRED DIRECTION OF GROUNDWATER FLOW

FIGURE 6-1

DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

GROUNDWATER CONTOUR MAP MAY 2002

SCALE: AS SHOWN

CAD FILE: 10060000_A0011.DWG

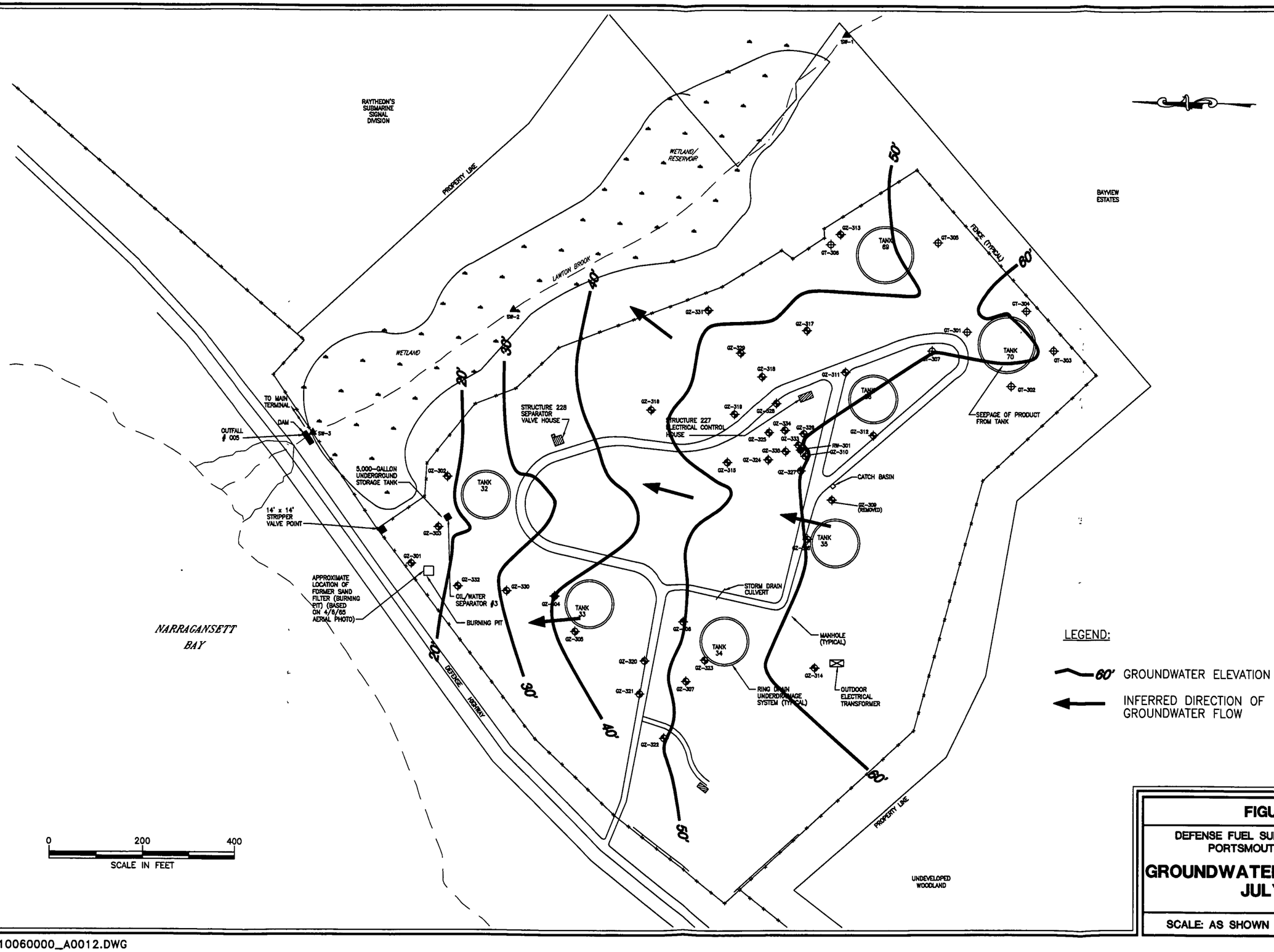


FIGURE 6-2

DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

GROUNDWATER CONTOUR MAP JULY 2002

SCALE: AS SHOWN

CAD FILE: 10060000_A0012.DWG

6.3.2 CCS

The RIDEM *Remediation Regulations* specify that any soil contaminated as a result of a release of hazardous materials is to be remediated in accordance with the applicable Direct Exposure and Leachability Criteria. TPH was found to exceed both of these criteria around Tank 35 at a depth of 14 feet bgs. Because of the impracticality of removing this soil, a land use restriction to prevent contact with this soil is proposed.

A sampling and analysis plan (SAP) will be prepared and submitted to RIDEM outlining DESC's proposed approach towards assessment of the additional areas of potential concern that have been identified. The following sections outline the principal areas of additional investigation proposed for Tank Farm 3. This additional investigation is proposed to be implemented in the Fall of 2002, based on discussions between DESC, the Navy, and RIDEM.

6.3.2.1 Sludge Pit

The tank cleaning wastes, or sludge, from tanks 69 and 70 were buried onsite until the early 1970s. From discussions with previous site personnel, it was concluded that there is one location on site were burial occurred. This sludge pit is located between soil gas locations SG3-23 and SG3-24, probably 20 to 30 feet from the road. Figure 6-3 shows the proposed location of the sludge pit and the proposed sampling needed for additional investigation. Foster Wheeler proposes to dig three to five parallel test pits at a spacing of 15 feet apart. Each test pit will be approximately 10 feet long and will extend to a maximum depth of five feet. The purpose of the pits will be to establish the extent and nature of the contamination. Before sampling begins, there will be visual and headspace screening with an OVA. Then, a minimum of one composite sample per pit will be collected and analyzed for TPH, metals, and BTEX + naphthalene. Each composite sample will be comprised of four alliquots. If no evidence of contamination is found, Foster Wheeler will collect one grab sample from the base of the pit. Petroflag™ screening along the sidewalls will also occur for a minimum of three samples per pit.

If the area can be delineated using field methods, we will excavate the contaminated soil and stage the material on plastic sheeting. The soil will then be transported off-site for recycling/disposal.

6.3.2.2 Former Sand Filter/Burn Pit

The former sand filter/burn pit was also discussed with previous site personnel. It was described as being lined with steel plates that were 25 feet x 25 feet and four feet deep, and its sides extended above the ground surface. The tank bottoms from the concrete Tanks 32 to 36 were placed in this pit and when a large amount accumulated, they were burned. After the burning, the sand was cleaned out and disposed of offsite. From the site personnel it was determined that this structure was removed in the late 1960s or early 1970s. Figure 6-4 shows the location of the former sand filter and the additional investigation suggested. Since the former location of the sand filter is now overgrown, the area will need to be cleared before any additional investigation is preformed.

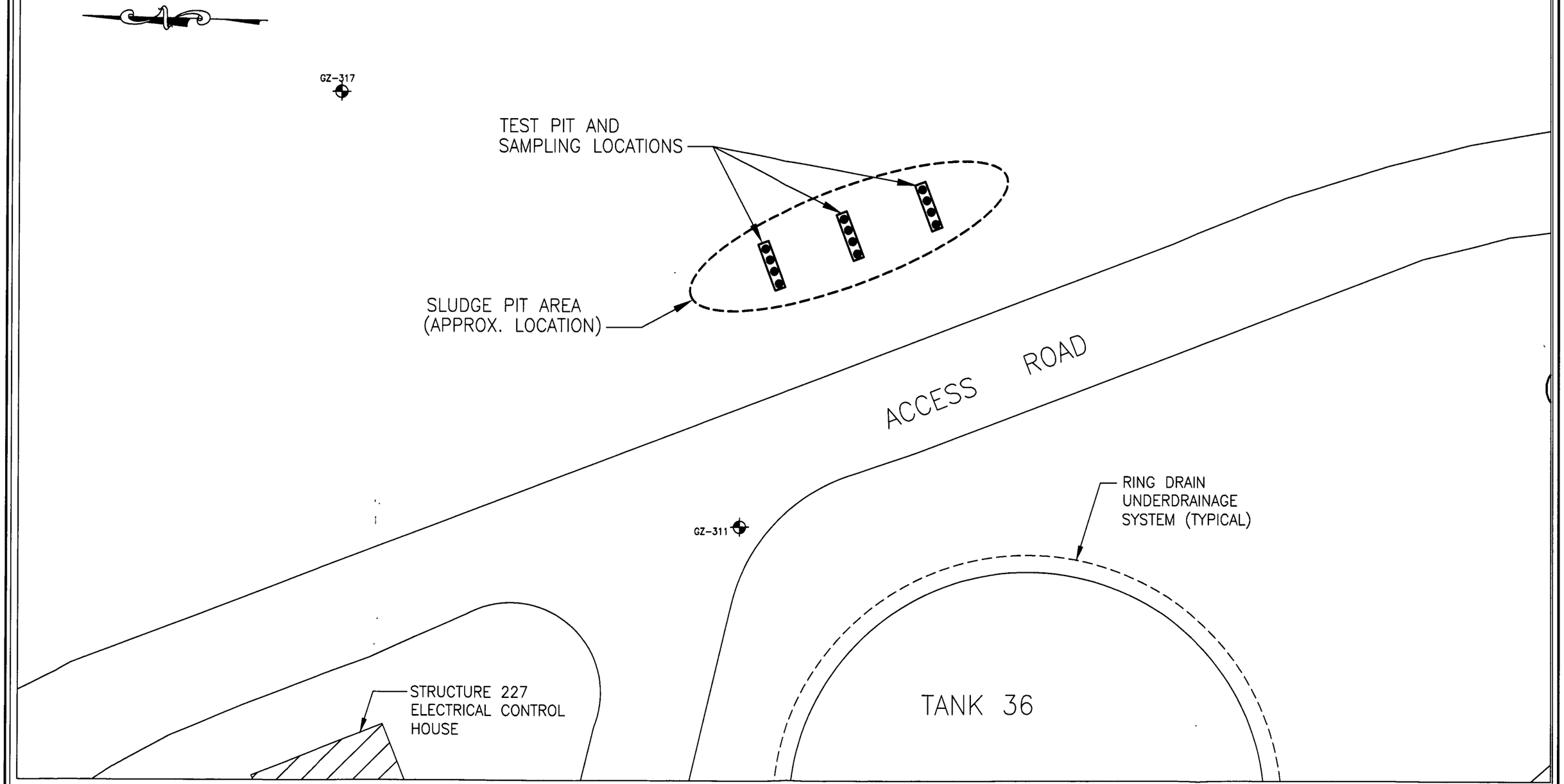


FIGURE 6-3

DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

APPROXIMATE SLUDGE PIT LOCATIONS AND PROPOSED SAMPLING LOCATIONS

SCALE: AS SHOWN

CAD FILE: 10060000_A007.DWG

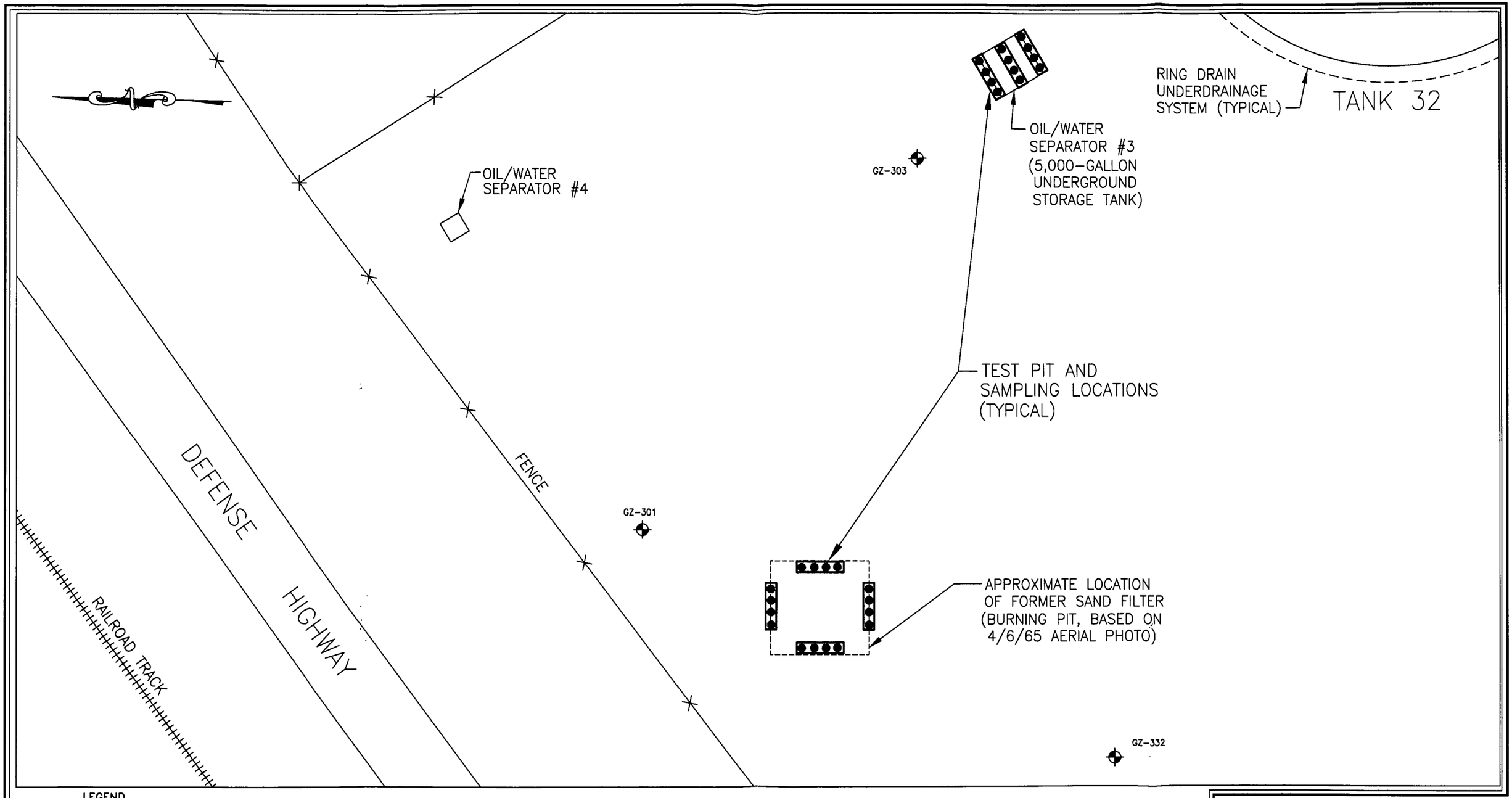


FIGURE 6-4

DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

FORMER SAND FILTER/BURN PIT AND OIL/WATER SEPARATOR #3 PROPOSED SAMPLING LOCATIONS

SCALE: AS SHOWN

CAD FILE: 10060000_A008.DWG

Foster Wheeler proposes to dig four test pits in the area of the former sand filter. Each test pit will be approximately 10 feet long and will extend to a maximum depth of eight feet. The purpose of the pits will be to establish the extent and nature of the contamination. After clearing is completed, there will be visual and headspace screening with an OVA in the area of the former sand filter. A minimum of one composite sample per pit will be collected and analyzed for TPH, metals, and BTEX + naphthalene. Each composite sample will be comprised of four alliquots. If no evidence of contamination is found, Foster Wheeler will collect one grab sample from the base of the pit. Petroflag™ screening along the sidewalls will also occur for a minimum of three samples per pit.

6.3.2.3 Oil/Water Separator #3

The oil/water separator #3 was located northwest of Tank 32 and was installed around 1974. It was disconnected and the piping re-routed to the new oil/water separator #4. Since there is no information on whether the old oil/water separator was removed or if any spills occurred, additional investigation is considered warranted. Figure 6-4 shows oil/water separator #3 and the proposed additional investigation.

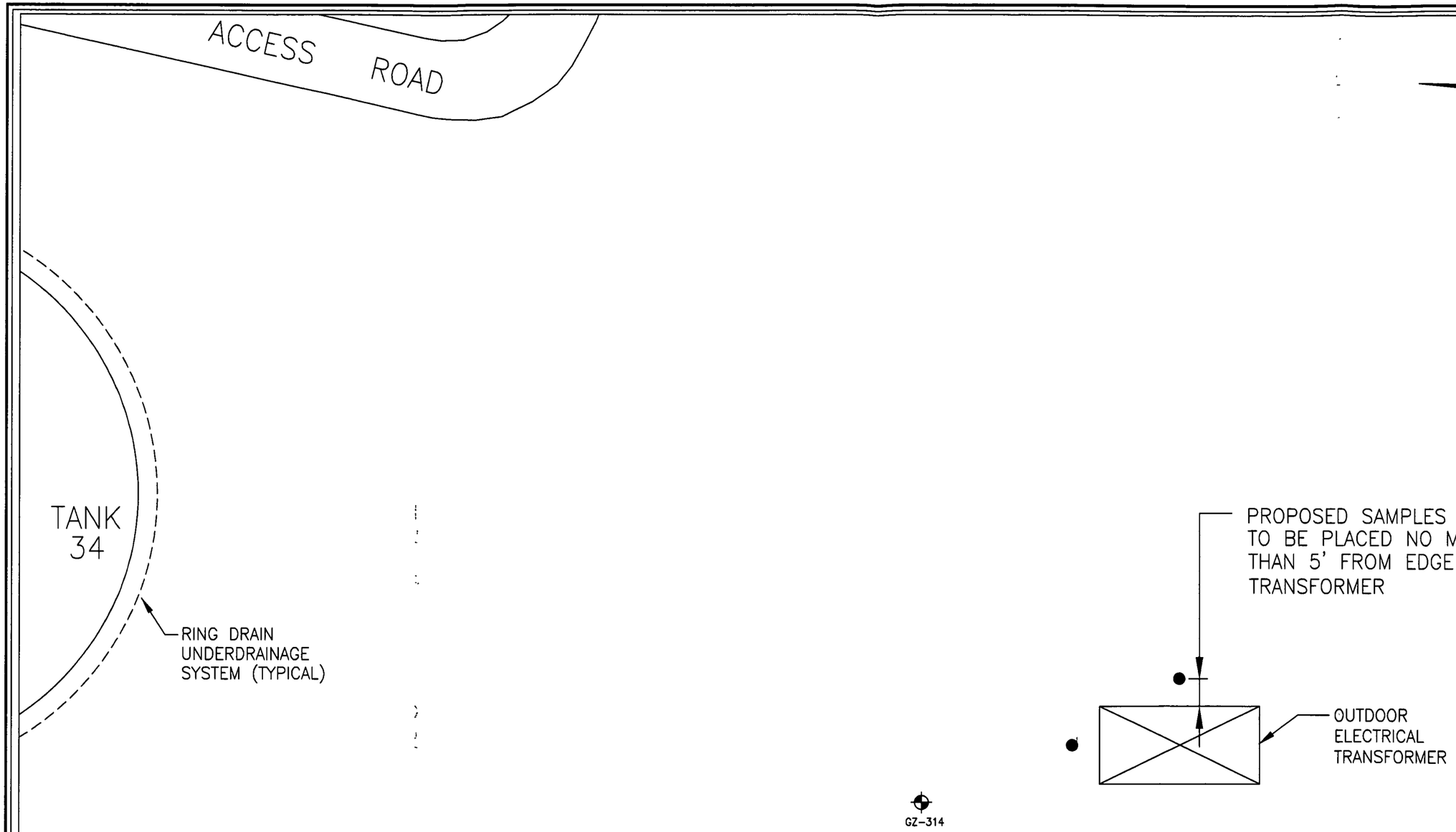
Foster Wheeler proposes to dig three parallel test pits at a spacing of 15 feet apart in the area of the former oil/water separator #3. Each test pit will be approximately 10 feet long and will extend to a maximum depth of eight feet. The purpose of the pits will be to establish the extent and nature of the contamination. A minimum of one composite sample per pit will be collected and analyzed for TPH, metals, and BTEX + naphthalene. Each composite sample will be comprised of four alliquots. If no evidence of contamination is found, Foster Wheeler will collect one grab sample from the base of the pit. Petroflag™ screening along the sidewalls will also occur for a minimum of three samples per pit.

6.3.2.4 Outdoor Electrical Transformer

The outdoor electrical transformer has been discussed with respect to the delineation of possible PCB contamination. Foster Wheeler suggests that additional sampling occur in order to delineate the possible extent of contamination. Figure 6-5 shows the two suggested locations where samples will be collected by hand auger. These samples will be taken down to a two feet depth at each location. The samples will then be analyzed for PCBs.

6.3.2.5 Valve House

The valve house is located between soil gas locations SG3-17 and SG3-18. It contains an oil/water separator that separated the water from the oil coming into the tank farm, pumped the oil to the tanks onsite, and pumped the water to an oil/water separator downgradient of the valve house. This valve house was in use until the mid-1980s. In order to identify if there was any leakage of piping, additional sampling is suggested. One test pit with two soil samples taken is suggested to identify the location of the pipe leaving the separator. These samples will be analyzed for Petroflag™ onsite and then one sample will be sent off site to a laboratory to be analyzed for TPH, BTEX + Naphthalene, and metals. Figure 6-6 shows the suggested additional sampling around the valve house.



LEGEND

PROPOSED SAMPLING LOCATION

EXISTING MONITORING WELL LOCATION

TANK 34 — UNDERGROUND STORAGE TANK

0 20 40

SCALE IN FEET

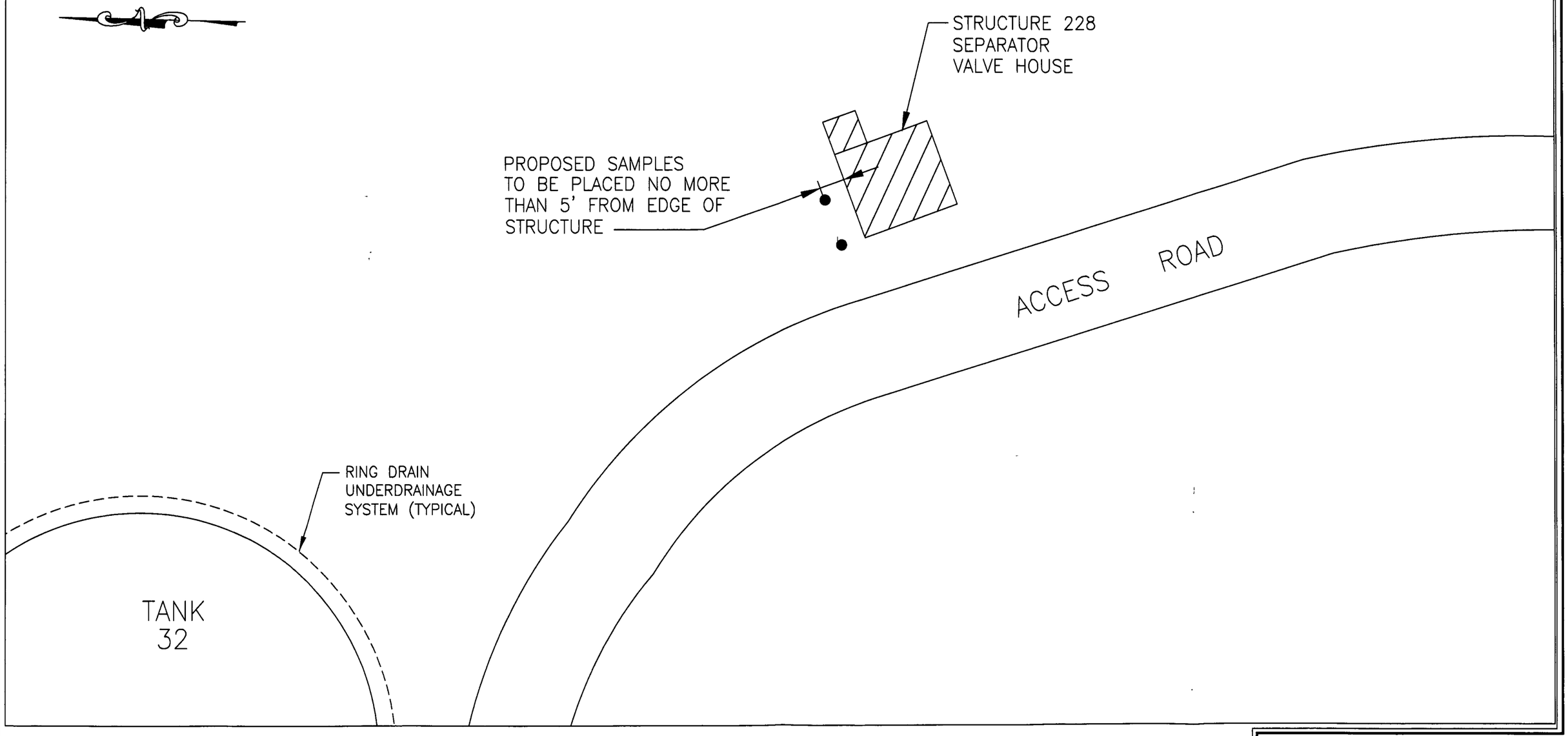
FIGURE 6-5

DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

OUTDOOR ELECTRICAL TRANSFORMER PROPOSED SAMPLING LOCATIONS

SCALE: AS SHOWN

CAD FILE: 10060000_A009.DWG



LEGEND

PROPOSED SAMPLING LOCATION

EXISTING MONITORING WELL LOCATION

TANK 32 — UNDERGROUND STORAGE TANK

0 20 40

SCALE IN FEET

FIGURE 6-6

DEFENSE FUEL SUPPORT POINT MELVILLE
PORTSMOUTH, RHODE ISLAND

VALVE HOUSE PROPOSED SAMPLING LOCATIONS

SCALE: AS SHOWN

CAD FILE: 10060000_A010.DWG

6.3.3 Follow-up Analysis and Response

The projected future use of Tank Farm 3, as a golf course, is considered to be restricted open space utilization. This will involve principally contact with the surficial soil and limited disturbance of the soil. DESC proposes to apply the Industrial/Commercial Direct Exposure Criteria as the benchmark values against which the supplemental soil sampling results will be compared. Consistent with the institutional controls and Environmental Land Usage Agreement discussed above with respect to the prohibition of groundwater extraction for purposes of drinking water, the Leachability Criteria would not be applied to the soil within the same groundwater variance boundary. Outside this boundary, the Leachability Criteria would be used to evaluate the supplemental soil sampling results.

Based on the results on these supplemental investigations and the comparisons to these Criteria, DESC will identify and evaluate appropriate response actions. These options may include the removal of additional soil.

7.0 REFERENCES

Progress Report on Initial Assessment Conducted in the Vicinity of Tank 70 Located in Tank Farm 3. Defense Fuel Support Point, Melville, Portsmouth, Rhode Island - October 1992 (Prepared by Groundwater Technology Government Services, Inc.)

Environmental Site Investigation - Tank Farm 3. Defense Fuel Supply Center, Portsmouth, Rhode Island - June 1995 (Prepared by GZA GeoEnvironmental, Inc.)

Supplemental Site Investigation - Tank Farm 3. Defense Fuel Supply Center, Melville, Portsmouth, Rhode Island - September, 1996 (Prepared by GZA GeoEnvironmental, Inc.)

Supplemental Site Investigation and Corrective Action Plan – Tank Farm 3. Defense Energy Support Center, Melville, Rhode Island - February 1998 (Prepared by GZA, Inc.)

Tank Closure Assessment Report – Tank Farm 3. Defense Energy Support Center, Melville, Portsmouth, Rhode Island – October 1998 (Prepared by GZA GeoEnvironmental, Inc.)

Results of Groundwater Sampling for Fuel Loading Area and Tank Farms 1, 2, and 3. Defense Fuel Support Point – Melville, Portsmouth, Rhode Island – September 1999 (Prepared by Foster Wheeler Environmental Corporation)

Tank Farm 3 Soil Removal Activities in the Vicinity of Tank 35. Defense Fuel Support Point, Melville, Portsmouth, Rhode Island – February 2000 (Prepared by Foster Wheeler Environmental Corporation)

Tank Closure Assessment Report – Tank Farm 3. Defense Energy Support Center, Melville, Portsmouth, Rhode Island – October 1998 (Prepared by GZA GeoEnvironmental, Inc.)

Closure Report for Underground Storage Tanks at Tank Farm 3. Defense Energy Support Center, Melville, Portsmouth, Rhode Island – 2001 (Prepared by Foster Wheeler Environmental Corporation)

Appendix A

Summary Evaluations for Areas of Potential Environmental Concern Previously Addressed

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

POSSIBLE SOURCE AREA Electrical Control House

FIGURE/MAP Figure X-X

SIZE (approx.)
Length 75 ft **Width** 12.5 ft
Area 937.5 ft^2 0 022 acres

DESCRIPTION OF AREA AND PAST OPERATIONS

- Located in the southeast portion of the site between the access roads just north of Tank 36
- Also known as Structure 227
- Contains an electrical transformer (must verify if still there)

DISTANCE TO PROPERTY LINES (approx.)

☑	North	1,050 ft
☑	South	750 ft
☑	East	550 ft
☑	West	1,000 ft

REFERENCES

1. Draft Tank Closure Assessment Report, Tank Farm 3. GZA (9/98)
2. Supplemental Site Investigation, Tank Farm 3. GZA (9/96)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	PCBs in transformer oil	☐	JP-4
2.	_____	☐	JP-5
3.	_____	☐	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☐	Other _____

RELEASE STATUS ☐ Confirmed Release ☑ Potential for Release

RELEASE SUMMARY (if applicable)

- Potential for leakage of PCBs from transformer(s) into groundwater or soil on site

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples **Surface (0'-2' bgs)** 1
Subsurface (vadose zone) N/A

Predominant Soil Type in the Vadose Zone _____

Groundcover Type grass

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

				ANALYTES											
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Electrical Control House	GZ-328	S-1	0-2	Dec-95	-	-	Dec-95	Dec-95	-	-	-	-	-	-	-

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations **Upgradient** N/A
Downgradient 1

Depth to Groundwater **Minimum** 14.49 ft bgs (3/96)
Average 16.92 ft bgs
Maximum 19.34 ft bgs (8/87)

Depth to Bedrock 15 ft bgs

Preferential Pathways for Groundwater Migration ☑ Yes ☐ No
Describe: Buried Utilities

Predominant Soil Type in the Saturated Zone _____

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

		ANALYTES											
Source Area	Well Associated with Source Area	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Electrical Control House	GZ-328	Jun-99	Jan-96	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-

NOTES
Shaded boxes indicate that there were other sampling events, with this being the most recent event

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid
Minimum N/A
Maximum N/A
Most Recent N/A

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
Electrical Control House	GZ-328	ND	6/96 – 6/99
NOTES ND = Not Dectected			

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☐ Yes ☑ No

Number of Soil Gas Samples N/A

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations
Upstream N/A
Downstream N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples
Surface (0"-6" depth) N/A
Subsurface (> 6" depth) N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☑ Yes ☐ No

Man-Made Structures Sampled in this Area ☐ Yes ☑ No

- ☐ Buildings
- ☐ Vaults
- ☐ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

If an Underground Storage Tank **Date Cleaned** _____
Date Closed _____

If Underground Distribution Lines **Date Cleaned** _____
Date Plugged _____

Notes

_____
_____
_____
_____
_____
_____

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Electrical	GZ-328	Soil	ND	12/95
Control		Groundwater	BGA	6/99
House		Free Product	ND	6/99
NOTES				
BGA = Below GA Groundwater Objective			L = Leaching Criteria	
BDC = Below Direct Contact			DC = Direct Contact	
BLC = Below Leaching Criteria			ND = Non Detect	

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil ☐ Yes ☐ No If so, which HS? _____

Groundwater ☐ Yes ☐ No If so, which HS? _____

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

POSSIBLE SOURCE AREA Petroleum Distribution Lines

FIGURE/MAP Figure X-X

SIZE (approx.)

Length	1,350 ft	**Width**	600 ft
Area	810,000 ft^2		18.59 acres

DESCRIPTION OF AREA AND PAST OPERATIONS

- Underground distribution lines connect all of the USTs and are located 4 feet below grade
- The lines are connected via underground lines to the Terminal Area 1 mile north of the site
- Pipelines were cleaned and permanently decommissioned between August and December of 1996

DISTANCE TO PROPERTY LINES (approx.)

☐	North	_____ ft
☐	South	_____ ft
☐	East	_____ ft
☐	West	_____ ft

REFERENCES

1. Draft Tank Closure Assessment Report, Tank Farm 3. GZA (9/98)
2. Environmental Site Investigation, Tank Farm 3. GZA (6/95)
3. Supplemental Site Investigation, Tank Farm 3. GZA (9/96)
4. Supplemental Site Investigation and Corrective Action Plan, Tank Farm 3. GZA (2/98)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☑	JP-4
2.	_____	☑	JP-5
3.	_____	☑	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☑	Marine Diesel Fuel

RELEASE STATUS ☐ Confirmed Release ☑ Potential for Release

RELEASE SUMMARY (if applicable)

- Potential leakage of distribution lines into soils or groundwater on site

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples **Surface (0'-2' bgs)** 1
Subsurface (vadose zone) 4

Predominant Soil Type in the Vadose Zone Coarse to fine sand, gravel, and silt

Groundcover Type grass/asphalt

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

				ANALYTES											
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Petroleum Distribution Lines	GZ-331	S-1	0-2	Apr-97	-	-	Apr-97	Apr-97	-	-	-	-	-	-	-
NOTE This boring is actually nearer to the Ring Drain System															

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

				ANALYTES											
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs /Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Petroleum Distribution Lines	GZ-316	S-2	5-7	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-
	GZ-329	S-2	5-7	Mar-97	-	-	Mar-97	Mar-97	-	-	-	-	-	-	-
NOTE Borings GZ-318 and 319 were not sampled															

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations **Upgradient** 1
Downgradient 5

Depth to Groundwater **Minimum** 5.71 ft bgs (GZ-316; 4/01)
Average 11.31 ft bgs
Maximum 26.46 bgs (GZ-316; 10/95)

Depth to Bedrock 5 to 16 ft bgs

Preferential Pathways for Groundwater Migration ☑ Yes ☐ No
Describe: Buried pipelines

Predominant Soil Type in the Saturated Zone Highly weathered shale

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

Source Area	Well Associated with Source Area	ANALYTES											
		TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Petroleum Distribution Lines	GZ-316	Jun-99	Jan-95	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-
	GZ-318	Jun-99	Jan-96	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-
	GZ-319	Jun-99	Jan-96	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-
	GZ-329	Jun-97	Jun-97	-	Jun-97	-	-	-	-	-	-	-	-
	GZ-331	Jun-97	Jun-97	-	Jun-97	-	-	-	-	-	-	-	-
NOTES Shaded boxes indicate that there were other sampling events, with this being the most recent event													

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**. Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid

Minimum 0.12 inches (GZ-318; 11/96)
Maximum 0.24 inches (GZ-318; 12/95)
Most Recent Non Detect

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
Petroleum Distribution Lines	GZ-316	ND	12/94 – 4/01
	GZ-318	0 02	12/95
		ND	1/96
		0 01	2/96 – 3/96
		ND	4/96
		0 01	5/96 – 6/97
		ND	7/96 – 8/96
		0 01	9/96
		ND	10/96
		0 01	11/96
		ND	12/96 – 6/01
	GZ-319	ND	12/95 – 4/01
	GZ-329	ND	4/97 – 4/01
	GZ-331	ND	4/97 – 4/01
NOTES· ND = Not Dectected			

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☑ Yes ☐ No

Number of Soil Gas Samples 27 (SG31-27)

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

******INSERT TABLE AS APPROPRIATE******

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations **Upstream** N/A
Downstream N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples **Surface (0"-6" depth)** N/A
Subsurface (> 6" depth) N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☐ Yes ☑ No

- ☐ Buildings
- ☐ Vaults
- ☐ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

If an Underground Storage Tank **Date Cleaned** _____
Date Closed _____

If Underground Distribution Lines **Date Cleaned** 9/96-11/96
Date Plugged 9/96-11/96

Notes

- Petroleum distribution lines were permanently decommissioned
- Pipelines were purged, water washed, and flushed with compressed air or nitrogen
- The interior of the pipes were screened with a PID and an LEL meter for residual VOCs. Cleaning was complete when readings were below project standards of 25 ppm on the PID and 0.0% on the LEL.
- After the appropriate levels were reached inside the pipelines, the openings to the pipes were grouted and a blank flange was attached to prevent reuse. A tag was then attached to the flange with the date of decommission.

SECTION 2.8 OTHER

Odors Present	☐ Yes	☑ No
Stained Soil Present	☐ Yes	☑ No
Stressed Vegetation Present	☐ Yes	☑ No
Excavated or Stockpiled Material Present	☐ Yes	☑ No

If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Petroleum Distribution Lines	GZ-316, 318, 319, 329, 331, Soil Gas	Soil	ND	*Soil gas data?* Borings GZ-318 and 319 were not sampled
		Groundwater	BGA	GZ-318 Naphthalene 0 14 mg/L (1/96) but 6/99 took SVOCs and naph=0 017 mg/L GA Criteria is 0 02 mg/l
		Free Product	ND	4/01
NOTES BGA = Below GA Groundwater BDC = Below Direct Contact BLC = Below Leaching Criteria		Objective		L = Leaching Criteria DC = Direct Contact ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil ☐ Yes ☐ No If so, which HS? _____

Groundwater ☐ Yes ☐ No If so, which HS? _____

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

POSSIBLE SOURCE AREA Tank 32

FIGURE/MAP Figure X-X

SIZE (approx.)

Length	150 ft	**Width** 100 ft	**Height** 33 5 ft
Area	15,000 ft^2	0 34 acres	**Diameter** 116 ft

DESCRIPTION OF AREA AND PAST OPERATIONS

- Installed in the early 1940s
- 1.18 million gallon concrete UST located about 5 feet below grade
- Ring drains are located around the tank 6 feet above the bottom of the tank and are connected to a common drainage pipe that discharges to the oil/water separator located near Tank 32
- Located around the tank is a valve pit, a gauging port and stripper pump, and an access hatch and pump
- Stored marine diesel fuel in the early 1940s, JP-5 between 1978 and 1986, and JP-8 in 1994
- After periodic cleanings, the tank bottoms were stripped and the water was discharged to the oil/water separator (or sand filter before it was removed), although, there was a potential for water discharged onto the ground surface
- The tank was closed and steam cleaned in August of 1996

DISTANCE TO PROPERTY LINES (approx.)

☑	North	250 ft
☑	South	1,200 ft
☑	East	600 ft
☑	West	400 ft

REFERENCES

1. Draft Tank Closure Assessment Report, Tank Farm 3. GZA (9/98)
2. Environmental Site Investigation, Tank Farm 3. GZA (6/95)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☐	JP-4
2.	_____	☑	JP-5
3.	_____	☑	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☑	Marine Diesel Fuel

RELEASE STATUS ☐ Confirmed Release ☑ Potential for Release

RELEASE SUMMARY (if applicable)

- Potential release of tank bottoms to ground surface instead of sand filter or oil/water separator
- Possible burial of tank sludge

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples **Surface (0'-2' bgs)** N/A
Subsurface (vadose zone) 1

Predominant Soil Type in the Vadose Zone Fine sand, loose silt, gravel, and shale

Groundcover Type grass/asphalt

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

N/A

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

				ANALYTES											
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Tank 32	GZ-302	S-2	5-7	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations **Upgradient** N/A
Downgradient 1

Depth to Groundwater **Minimum** 14.99 ft bgs (3/95)
Average 19.46 ft bgs
Maximum 23.92 ft bgs (9/97)

Depth to Bedrock 11 ft bgs

Preferential Pathways for Groundwater Migration ☑ Yes ☐ No
Describe: Fuel distribution lines; Ring drain system

Predominant Soil Type in the Saturated Zone Slightly to highly weathered shale

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

		ANALYTES												
Source Area	Well Associated with Source Area	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 32	GZ-302	Jun-99	Jan-95	-	Jun-99	Jan-96	Jun-99	Jun-99	Jun-99	-	-	-	-	GW - Lead exceedance (6/99)

NOTES
Shaded boxes indicate that there were other sampling events, with this being the most recent event

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid

Minimum	Non Detect
Maximum	Non Detect
Most Recent	Non Detect

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date(s) Measured
Tank 32	GZ-302	ND	12/94 – 6/99
NOTES ND = Not Dectected			

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☑ Yes ☐ No

Number of Soil Gas Samples 3 (SG3-3, 15, and 16)

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

****INSERT TABLE AS APPROPRIATE****

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations

Upstream	N/A
Downstream	N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples

Surface (0"-6" depth)	N/A
Subsurface (> 6" depth)	N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☑ Yes ☐ No

- ☐ Buildings
- ☐ Vaults
- ☑ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

Tank Number	Contents	Water Level (ft)	Sludge Layer (ft)	Product Layer (ft)	Date Sampled
32	JP-8	0 01	-	0 28	8/13/96

If an Underground Storage Tank **Date Cleaned** 8/96
Date Closed 8/96

If Underground Distribution Lines **Date Cleaned** _____
Date Plugged _____

Notes

- Before cleaning activities began, representative samples were collected from the contents of the tank for waste characterization
- Residual fuel and fluids were removed and the tank was cleaned with a water soluble, biodegradable degreaser
- After the degreaser had penetrated the residual fuel and sludge, the surfaces were rinse with water
- Residual wastewater, sludge, oils, and other debris were collected and removed from the tank via pumps and vacuum trucks to be transported off site to a disposal facility
- Accessible appurtenances associated with the tank (i.e., pumps, interior pipelines, vaults, etc.) were also cleaned
- After cleaning activities, a structural assessment and gas free assessment was completed on the tank
- The tank was certified gas free. Structurally, spalled surfaces were noted on the tank's surface and a few surface cracks were noted on the roof, although no notable water flow was evident.

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Tank 32	GZ-302	Soil	ND	11/94

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
		Groundwater	Lead - 0 029 mg/L (6/99)	Lead GA Objective = 0 015 mg/L
		Free Product	ND	6/99
NOTES BGA = Below GA Groundwater Objective BDC = Below Direct Contact BLC = Below Leaching Criteria				L = Leaching Criteria DC = Direct Contact ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil ☐ Yes ☐ No If so, which HS? _____

Groundwater ☐ Yes ☐ No If so, which HS? _____

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

POSSIBLE SOURCE AREA Tank 33

FIGURE/MAP Figure X-X

SIZE (approx.)

Length	225 ft	**Width** 125 ft	**Height** 33.5 ft
Area	28,125 ft^2	0 65 acres	**Diameter** 116 ft

DESCRIPTION OF AREA AND PAST OPERATIONS

- Installed in the early 1940s
- 1.18 million gallon concrete UST located about 5 feet below grade
- Ring drains are located around the tank 6 feet above the bottom of the tank and are connected to a common drainage pipe that discharges to the oil/water separator located near Tank 32
- Located around the tank is a valve pit, a gauging port and stripper pump, and an access hatch and pump
- Stored marine diesel fuel in the early 1940s, JP-5 between 1978 and 1986, and JP-8 in 1994
- After periodic cleanings, the tank bottoms were stripped and the water was discharged to the oil/water separator (or sand filter before it was removed), although, there was a potential for water discharged onto the ground surface
- The tank was closed and steam cleaned in August of 1996

DISTANCE TO PROPERTY LINES (approx.)

☑	North	300 ft
☑	South	950 ft
☑	East	1,050 ft
☑	West	450 ft

REFERENCES

1. Draft Tank Closure Assessment Report, Tank Farm 3. GZA (9/98)
2. Environmental Site Investigation, Tank Farm 3. GZA (6/95)
3. Supplemental Sie Investigation and Corrective Action Plan, Tank Farm 3. GZA (2/98)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☐	JP-4
2.	_____	☑	JP-5
3.	_____	☑	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☑	Other: Marine Diesel Fuel

RELEASE STATUS ☐ Confirmed Release ☑ Potential for Release

RELEASE SUMMARY (if applicable)

- Potential release of tank bottoms to ground surface instead of sand filter or oil/water separator
- Possible burial of tank bottom sludge

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples **Surface (0'-2' bgs)** 2
Subsurface (vadose zone) 1

Predominant Soil Type in the Vadose Zone Silt, coarse to fine sand, and gravel

Groundcover Type grass

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

				ANALYTES											
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Tank 33	GZ-304	S-1	0-2	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-
	GZ-305	S-1	0-2	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

				ANALYTES											
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Tank 33	GZ-330	S-2	5-7	Mar-97	-	-	Mar-97	Mar-97	-	-	-	-	-	-	-

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations **Upgradient** 1
Downgradient 2

Depth to Groundwater **Minimum** 14.67 ft bgs (GZ-305; 1/95)
Average 17.41 ft bgs
Maximum 20.15 ft bgs (GZ-330; 6/97)

Depth to Bedrock 12 ft bgs

Preferential Pathways for Groundwater Migration ☑ Yes ☐ No
Describe: Fuel distribution lines; Ring drain system

Predominant Soil Type in the Saturated Zone Moderately weathered shale

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

Source Area	Well Associated with Source Area	ANALYTES: TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 33	GZ-304	Aug-97	Jan-95	-	Aug-97	Aug-97	-	-	-	-	-	-	-	GW - Naphthalene exceedance (8/97), Free Product measured (4/01)
	GZ-305	Jun-99	Jan-95	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-	
	GZ-330	Jun-99	Jun-97	-	Jun-99	-	Jun-99	-	-	-	-	-	-	

NOTES:
Shaded boxes indicate that there were other sampling events, with this being the most recent event

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☑ Yes ☐ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid

Minimum 0.12 inches (GZ-304; 3/01)
Maximum 1.8 inches (GZ-304; 2/01)
Most Recent 0 24 inches (GZ-304; 4/01)

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
Tank 33	GZ-304	ND	12/94 – 12/95
		0 05	1/96
		0 03	2/96
		0 15	3/96
		0 01	4/96
		0 09	5/96 – 7/96
		0 08	8/96
		ND	9/96
		0 01	10/96
		0 03	11/96
		0 01	12/96
		ND	1/97
		0 06	2/97
		ND	3/97 – 4/97
		0 07	5/97
		0 05	6/97 – 7/97
		ND	8/97 – 9/97
		0 01	6/99
		0 03	1/01
		0 15	2/01
		0 01	3/01
		0 05	4/5/01
		0 02	4/27/01
	GZ-305	ND	12/94 – 4/01
	GZ-330	ND	4/97 – 6/99

NOTES
ND = Not Dectected

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☑ Yes ☐ No

Number of Soil Gas Samples 3 (SG3-5-7)

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

****INSERT TABLE AS APPROPRIATE****

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations **Upstream** N/A
Downstream N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples **Surface (0"-6" depth)** N/A
Subsurface (> 6" depth) N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☑ Yes ☐ No

- ☐ Buildings
- ☐ Vaults
- ☑ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

Tank Number	Contents	Water Level (ft)	Sludge Layer (ft)	Product Layer (ft)	Date Sampled
33	JP-8	0 08	-	0 02	8/20/96

If an Underground Storage Tank **Date Cleaned** 8/96
Date Closed 8/96

If Underground Distribution Lines **Date Cleaned** _____
Date Plugged _____

Notes

- Before cleaning activities began, representative samples were collected from the contents of the tank for waste characterization

- Residual fuel and fluids were removed and the tank was cleaned with a water soluble, biodegradable degreaser
- After the degreaser had penetrated the residual fuel and sludge, the surfaces were rinse with water
- Residual wastewater, sludge, oils, and other debris were collected and removed from the tank via pumps and vacuum trucks to be transported off site to a disposal facility
- Accessible appurtenances associated with the tank (i.e , pumps, interior pipelines, vaults, etc.) were also cleaned
- After cleaning activities, a structural assessment and gas free assessment was completed on the tank
- The tank was certified gas free. Structurally, spalled surfaces were detected, the coating on the floor was found to be in poor condition, and a few cracks were noted on the roof.

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Tank 33	GZ-304, 305, 330	Soil	BDC, BLC	GZ-304, 11/94
		Groundwater	Naphthalene - 0 15 mg/L	GZ-304 8/97
		Free Product	0 02 ft	GZ-304, 4/01
NOTES BGA = Below GA Groundwater Objective BDC = Below Direct Contact BLC = Below Leaching Criteria				L = Leaching Criteria DC = Direct Contact ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☑ Yes ☐ No

Soil ☐ Yes ☑ No If so, which HS? _____

Groundwater ☑ Yes ☐ No If so, which HS? Non-Aqueous Phase Liquid – GZ-304 (0 02 ft)

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

POSSIBLE SOURCE AREA Tank 34

FIGURE/MAP Figure X-X

SIZE (approx.)

Length	275 ft	**Width** 200 ft	**Height** 33.5 ft
Area	55,000 ft^2	1.26 acres	**Diameter** 116 ft

DESCRIPTION OF AREA AND PAST OPERATIONS

- Installed in the early 1940s
- 1.18 million gallon concrete UST located about 5 feet below grade
- Ring drains are located around the tank 6 feet above the bottom of the tank and are connected to a common drainage pipe that discharges to the oil/water separator located near Tank 32
- Located around the tank is a valve pit, a gauging port and stripper pump, and an access hatch and pump
- Stored marine diesel fuel in the early 1940s, JP-5 between 1978 and 1986, and JP-8 in 1994
- After periodic cleanings, the tank bottoms were stripped and the water was discharged to the oil/water separator (or sand filter before it was removed), although, there was a potential for water discharged onto the ground surface
- The tank was closed and steam cleaned in August of 1996

DISTANCE TO PROPERTY LINES (approx.)

☑	North	550 ft
☑	South	650 ft
☑	East	1,200 ft
☑	West	600 ft

REFERENCES

1. Draft Tank Closure Assessment Report, Tank Farm 3. GZA (9/98)
2. Environmental Site Investigation, Tank Farm 3. GZA (6/95)
3. Supplemental Site Investigation, Tank Farm 3. GZA (9/96)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☐	JP-4
2.	_____	☑	JP-5
3.	_____	☑	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☑	Other: Marine Diesel Fuel

RELEASE STATUS ☐ Confirmed Release ☑ Potential for Release

RELEASE SUMMARY (if applicable)

- Potential release of tank bottoms to ground surface instead of sand filter or oil/water separator
- Possible burial of tank bottom sludge

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples — **Surface (0'-2' bgs)** 1; **Subsurface (vadose zone)** 5

Predominant Soil Type in the Vadose Zone — Coarse to fine sand and gravel and moderately weathered shale

Groundcover Type — grass

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

				ANALYTES												
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Tank 34	GZ-306	S-1	0-2	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

				ANALYTES											
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Tank 34	GZ-307	S-2	5-7	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-
	GZ-323	S-2	5-7	Nov-95	-	-	Nov-95	Nov-95	-	-	-	-	-	-	-
NOTE Borings GZ-320 to 322 were not sampled															

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations — **Upgradient** N/A; **Downgradient** 6

Depth to Groundwater — **Minimum** 2 30 ft bgs (GZ-321; 4/97); **Average** 15.47 ft bgs; **Maximum** 28.64 ft bgs (GZ-306; 10/95)

Depth to Bedrock — 1.2 - 10 ft bgs

Preferential Pathways for Groundwater Migration ☑ Yes ☐ No
Describe: Fuel distribution lines; Ring drain system

Predominant Soil Type in the Saturated Zone — Weathered slate and sandstone/siltstone

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

		ANALYTES												
Source Area	Well Associated with Source Area	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 34	GZ-306	Jan-95	Jan-95	-	Jan-95	Jan-96	-	-	-	-	-	-	-	
	GZ-307	Jan-96	Jan-96	-	Jan-96	Jan-96	-	-	-	-	-	-	-	
	GZ-320	Jan-96	Jan-96	-	Jan-96	Jan-96	-	-	-	-	-	-	-	
	GZ-321	Jan-96	Jan-96	-	Jan-96	Jan-96	-	-	-	-	-	-	-	
	GZ-322	Jun-99	Jan-96	-	Jun-99	Jan-96	Jun-99	Jun-99	-	-	-	-	-	
	GZ-323	Aug-97	Jan-96	-	Aug-97	Aug-97	-	-	-	-	-	-	-	
NOTES Shaded boxes indicate that there were other sampling events, with this being the most recent event														

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid

Minimum 0 12 inches (GZ-323; 11/96)
Maximum 0 72 inches (GZ-323; 12/95)
Most Recent Non Detect

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
Tank 34	GZ-306	ND	12/94 – 4/01
	GZ-307	ND	12/94 – 9/97, 1/01- 4/01
	GZ-320	ND	12/95 – 6/99, 4/01
	GZ-321	ND	12/95 – 6/99, 2/01 – 4/01
	GZ-322	ND	12/95 – 6/99
	GZ-323	0 06	12/95
		0 01	1/96 – 5/96
		ND	6/96 – 8/96
		0 01	9/96
		ND	10/96
		0 01	11/96
		ND	12/96 – 4/01
NOTES ND = Not Dectected			

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☑ Yes ☐ No

Number of Soil Gas Samples 2 (SG3-8 and 9)

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

****INSERT TABLE AS APPROPRIATE****

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations

Upstream N/A
Downstream N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples
Surface (0"-6" depth) N/A
Subsurface (> 6" depth) N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☑ Yes ☐ No

- ☐ Buildings
- ☐ Vaults
- ☑ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

Tank Number	Contents	Water Level (ft)	Sludge Layer (ft)	Product Layer (ft)	Date Sampled
34	JP-8	0 02	-	0 04	8/09/96

If an Underground Storage Tank
Date Cleaned 8/96
Date Closed 8/96

If Underground Distribution Lines
Date Cleaned _____
Date Plugged _____

Notes

- Before cleaning activities began, representative samples were collected from the contents of the tank for waste characterization
- Residual fuel and fluids were removed and the tank was cleaned with a water soluble, biodegradable degreaser
- After the degreaser had penetrated the residual fuel and sludge, the surfaces were rinse with water
- Residual wastewater, sludge, oils, and other debris were collected and removed from the tank via pumps and vacuum trucks to be transported off site to a disposal facility
- Accessible appurtenances associated with the tank (i.e., pumps, interior pipelines, vaults, etc.) were also cleaned
- After cleaning activities, a structural assessment and gas free assessment was completed on the tank

- The tank was certified gas free. Structurally, spalled surfaces were detected, as well as a crack located on the roof that did not show water flow.

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Tank 34	GZ-306, 307, 320, 321, 322, 323	Soil	BDC, BLC	Borings GZ-320-322 were not sampled
		Groundwater	BGA	1/96
		Free Product	ND	4/01
NOTES BGA = Below GA Groundwater Objective BDC = Below Direct Contact BLC = Below Leaching Criteria				L = Leaching Criteria DC = Direct Contact ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil ☐ Yes ☐ No If so, which HS? _____

Groundwater ☐ Yes ☐ No If so, which HS? _____

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

POSSIBLE SOURCE AREA Tank 36

FIGURE/MAP Figure X-X

SIZE (approx.)

Length	275 ft	**Width** 100 ft	**Height** 33.5 ft
Area	27,500 ft^2	0.63 acres	**Diameter** 116 ft

DESCRIPTION OF AREA AND PAST OPERATIONS

- Installed in the early 1940s
- 1.18 million gallon concrete UST located about 5 feet below grade
- Ring drains are located around the tank 6 feet above the bottom of the tank and are connected to a common drainage pipe that discharges to the oil/water separator located near Tank 32
- Located around the tank is a valve pit, a gauging port and stripper pump, and an access hatch and pump
- Stored marine diesel fuel in the early 1940s, JP-5 between 1978 and 1986, and JP-8 in 1994
- After periodic cleanings, the tank bottoms were stripped and the water was discharged to the oil/water separator (or sand filter before it was removed), although, there was a potential for water discharged onto the ground surface
- The tank was closed and steam cleaned in July of 1996

DISTANCE TO PROPERTY LINES (approx.)

☑	North	1,100 ft
☑	South	600 ft
☑	East	800 ft
☑	West	850 ft

REFERENCES

1. Draft Tank Closure Assessment Report, Tank Farm 3. GZA (9/98)
2. Site Investigation, Tank Farm 3. GZA (6/95)
3. Supplemental Site Investigation, Tank Farm 3. GZA (8/96)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☐	JP-4
2.	_____	☑	JP-5
3.	_____	☑	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☑	Marine Diesel Fuel

RELEASE STATUS ☐ Confirmed Release ☑ Potential for Release

RELEASE SUMMARY (if applicable)

- Potential release of tank bottoms to ground surface instead of sand filter or oil/water separator
- Possible burial of tank sludge

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples — **Surface (0'-2' bgs)** 1; **Subsurface (vadose zone)** 2

Predominant Soil Type in the Vadose Zone Coarse to fine sand and gravel

Groundcover Type grass/asphalt

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

				ANALYTES												
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 36	GZ-311	S-1	0 2-2 2	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-	

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

				ANALYTES												
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 36	GZ-312	S-4	15-17	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-	
	GZ-317			Dec-95	-	-	-	-	-	-	-	-	-	-	-	

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations — **Upgradient** 1; **Downgradient** 2

Depth to Groundwater — **Minimum** 13.45 ft bgs (GZ-311; 4/01); **Average** 18.92 ft bgs; **Maximum** 24.38 ft bgs (GZ-311; 10/95)

Depth to Bedrock 16 to 23.5 ft bgs

Preferential Pathways for Groundwater Migration ☑ Yes ☐ No
Describe: Fuel distribution lines; Ring drain system

Predominant Soil Type in the Saturated Zone _____

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

		ANALYTES												
Source Area	Well Associated with Source Area	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 36	GZ-311	Jul-97	Jan-95	-	Jul-97	Jul-97	-	-	-	-	-	-	-	
	GZ-312	Jan-95	Jan-95	-	Jan-95	Jan-96	-	-	-	-	-	-	-	
	GZ-317	Jan-96	Jan-96	-	Jan-96	Jan-96	-	-	-	-	-	-	-	
NOTES Shaded boxes indicate that there were other sampling events, with this being the most recent event														

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid

Minimum Non Detect
Maximum Non Detect
Most Recent Non Detect

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Dates Measured
Tank 36	GZ-311	ND	12/94 – 4/01
	GZ-312	ND	12/94 – 6/99
	GZ-317	ND	12/95 – 6/99
NOTES. ND = Not Dectected			

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☑ Yes ☐ No

Number of Soil Gas Samples 1 (SG3-26)

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

******INSERT TABLE AS APPROPRIATE******

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations

Upstream N/A
Downstream N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples **Surface (0"-6" depth)** N/A
Subsurface (> 6" depth) N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☑ Yes ☐ No

- ☐ Buildings
- ☐ Vaults
- ☑ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

Tank Number	Contents	Water Level (ft)	Sludge Layer (ft)	Product Layer (ft)	Date Sampled
36	JP-8	0 02	-	0 06	7/25/96

If an Underground Storage Tank **Date Cleaned** 7/96
Date Closed 7/96

If Underground Distribution Lines **Date Cleaned** _____
Date Plugged _____

Notes

- Before cleaning activities began, representative samples were collected from the contents of the tank for waste characterization
- Residual fuel and fluids were removed and the tank was cleaned with a water soluble, biodegradable degreaser
- After the degreaser had penetrated the residual fuel and sludge, the surfaces were rinse with water
- Residual wastewater, sludge, oils, and other debris were collected and removed from the tank via pumps and vacuum trucks to be transported off site to a disposal facility
- Accessible appurtenances associated with the tank (i.e., pumps, interior pipelines, vaults, etc.) were also cleaned
- After cleaning activities, a structural assessment and gas free assessment was completed on the tank
- The tank was certified gas free. Structurally, cracks were found in the roof, however, no noticeable water flow was evident. The floors and chine were found in good condition.

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Tank 36	GZ-311, 312, 317	Soil	BDC, BLC	11/94
		Groundwater	BGA	7/97
		Free Product	ND	4/01
NOTES BGA = Below GA Groundwater Objective BDC = Below Direct Contact BLC = Below Leaching Criteria				L = Leaching Criteria DC = Direct Contact ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil ☐ Yes ☐ No If so, which HS? _____

Groundwater ☐ Yes ☐ No If so, which HS? _____

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

POSSIBLE SOURCE AREA Tank 69

FIGURE/MAP Figure X-X

SIZE (approx.)

Length 225 ft		**Width** 125 ft	**Height** 24 ft
Area 28,125 ft^2		0.65 acres	**Diameter** 118 ft

DESCRIPTION OF AREA AND PAST OPERATIONS

- 2.1 million gallon steel UST located 5 feet below grade, installed in 1953
- Distribution lines connect this UST to the others on site
- Ring drains are located around the UST, located 6 feet above the bottom of the tank, and are connected to a common drainage pipe that discharges to the oil/water separator
- Located around the tank is a valve pit, a gauging port and stripper pump, and an access hatch and pump
- Used to store JP-5 fuel , JP-4 in 1980, and JP-5 again in 1994
- Stripper pump was used to discharge the tank bottoms into the oil/water separator, possibly onto the ground
- In July and August of 1996, tank was closed and steam cleaned

DISTANCE TO PROPERTY LINES (approx.)

☑	North	1,050 ft
☑	South	325 ft
☑	East	450 ft
☑	West	1,200 ft

REFERENCES

1. Draft Tank Closure Assessment Report, Tank Farm 3. GZA (9/98)
2. Progress Report on Initial Assessment Conducted in the Vicinity of Tank 70 Located in Tank Farm 3. GTI (10/92)
3. Environmental Site Investigation, Tank Farm 3. GZA (6/95)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☑	JP-4
2.	_____	☑	JP-5
3.	_____	☐	JP-8
4	_____	☐	No. 6 Fuel Oil
5.	_____	☐	Other: _____

RELEASE STATUS ☐ Confirmed Release ☑ Potential for Release

RELEASE SUMMARY (if applicable)

- Potential release of tank bottoms to ground surface instead of sand filter or oil/water separator
- Possible burial of tank sludge

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples **Surface (0'-2' bgs)** 1
Subsurface (vadose zone) 2

Predominant Soil Type in the Vadose Zone Medium to fine sand and trace clay

Groundcover Type grass

Potential for Wind / Water Erosion ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

				ANALYTES											
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Tank 69	GT-306	S-1	0-1	-	-	Sep-92	-	-	-	-	-	-	-	-	-

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

				ANALYTES												
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 69	GT-305	SS-3	13 5-15 5	-	-	Sep-92	-	-	-	-	-	-	-	-	-	
	GZ-313	S-2	5-6 4	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-	
	GT-301 to 307	comp		-	-	-	Sep-92	-	Sep-92	Sep-92	Sep-92	-	-	-	-	Soil - As, Ba, Cr, Pb, Ni exceedances

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations **Upgradient** 1
Downgradient 2

Depth to Groundwater **Minimum** 12.61 ft bgs (GT-305; 1/96)
Average 24 86 ft bgs
Maximum 37.11 ft bgs (GZ-313; 9/95)

Depth to Bedrock 11 ft bgs

Preferential Pathways for Groundwater Migration ☑ Yes ☐ No
Describe: Fuel distribution lines; Ring drain system

Predominant Soil Type in the Saturated Zone Slightly to moderately fractured shale

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

ANALYTES

Source Area	Well Associated with Source Area	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 69	GT-305	Jun-99	Jan-95	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-	
	GT-306	-	-	-	-	-	-	-	-	-	-	-	-	Dry
	GZ-313	Aug-97	Jan-95	-	Aug-97	Aug-97	-	-	-	-	-	-	-	

NOTES
Shaded boxes indicate that there were other sampling events, with this being the most recent event

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**. Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid

Minimum	Non Detect
Maximum	Non Detect
Most Recent	Non Detect

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
Tank 69	GT-305	ND	12/94 – 6/99
	GT-306	DRY	12/94 – 9/96
		ND	10/96
		DRY	11/96 – 6/99
	GZ-313	ND	12/94 – 9/97
		DRY	6/99
		ND	1/01 – 4/01

NOTES
ND = Not Dectected

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☑ Yes ☐ No

Number of Soil Gas Samples 3 (SG3-24 and 27)

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

******INSERT TABLE AS APPROPRIATE******

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations

Upstream	N/A
Downstream	N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples **Surface (0"-6" depth)** N/A
Subsurface (> 6" depth) N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☑ Yes ☐ No

- ☐ Buildings
- ☐ Vaults
- ☑ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

Tank Number	Contents	Water Level (ft)	Sludge Layer (ft)	Product Layer (ft)	Date Sampled
69	JP-5	0 02	0 01	0 18	7/26/96

If an Underground Storage Tank **Date Cleaned** 7/96-8/96
Date Closed 7/96-8/96

If Underground Distribution Lines **Date Cleaned** _____
Date Plugged _____

Notes

- Before cleaning activities began, representative samples were collected from the contents of the tank for waste characterization
- Residual fuel and fluids were removed and the tank was cleaned with a water soluble, biodegradable degreaser
- After the degreaser had penetrated the residual fuel and sludge, the surfaces were rinse with water
- Residual wastewater, sludge, oils, and other debris were collected and removed from the tank via pumps and vacuum trucks to be transported off site to a disposal facility
- Accessible appurtenances associated with the tank (i.e., pumps, interior pipelines, vaults, etc.) were also cleaned
- After cleaning activities, a structural assessment and gas free assessment was completed on the tank
- The epoxy coating to this tank was removed after cleaning to facilitate inspection by the marine chemist
- The tank was certified gas free. Structurally, no holes or thinning of the shell was detected, the floor was in good condition, as were the supporting walls of the tank. Weeping was noted along the floor seams.

SECTION 2.8 OTHER

Odors Present	☐ Yes	☑ No
Stained Soil Present	☐ Yes	☑ No
Stressed Vegetation Present	☐ Yes	☑ No
Excavated or Stockpiled Material Present	☐ Yes	☑ No

If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Tank 69	GT-305, 306, GZ-313	Composite Soil Sample	Arsenic - 6 mg/kg (DC), Barium (L) - 34 mg/kg (L), Chromium - 14 mg/kg (L), Lead - 9 mg/kg (L), Nickel (L) - 19 mg/kg	(GT-301-307, 9/92)
		Soil	BDC, BLC	9/92
		Groundwater	BGA	6/99
		Free Product	ND	6/99
NOTES BGA = Below GA Groundwater Objective BDC = Below Direct Contact BLC = Below Leaching Criteria				L = Leaching Criteria DC = Direct Contact ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil ☐ Yes ☐ No If so, which HS? _____

Groundwater ☐ Yes ☐ No If so, which HS? _____

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

POSSIBLE SOURCE AREA Tank 70

FIGURE/MAP Figure X-X

SIZE (approx.)

Length	175 ft	**Width** 250 ft	**Height** 24 ft
Area	43,750 ft^2	1 acre	**Diameter** 118 ft

DESCRIPTION OF AREA AND PAST OPERATIONS

- 2 1 million gallon steel UST located 5 feet below grade, installed in 1954
- Distribution lines connect this UST to the others on site
- Ring drains are located around the UST, located 6 feet above the bottom of the tank, and are connected to a common drainage pipe that discharges to the oil/water separator
- Located around the tank is a valve pit, a gauging port and stripper pump, and an access hatch and pump
- Used to store JP-5 fuel, JP-4 in 1993, and back to JP-5 in 1994
- Stripper pump was used to discharge the tank bottoms into the oil/water separator, possibly onto the ground
- In July of 1996, the tank was closed and steam cleaned.

DISTANCE TO PROPERTY LINES (approx.)

☑	North	1,500 ft
☑	South	200 ft
☑	East	300 ft
☑	West	350 ft

REFERENCES

1. Draft Tank Closure Assessment Report, Tank Farm 3. GZA (9/98)
2. Progress Report on Initial Assessment Conducted in the Vicinity of Tank 70 in Tank Farm 3. GTI (10/92)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☑	JP-4
2.	_____	☑	JP-5
3.	_____	☐	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☐	Other: _____

RELEASE STATUS ☑ Confirmed Release ☐ Potential for Release

RELEASE SUMMARY (if applicable)

- Petroleum leak observed in 1992 and a Notice of Violation (NOV) was issued by RIDEM
- Potential release of tank bottoms to ground surface instead of sand filter or oil/water separator
- Possible burial of tank sludge

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples **Surface (0'-2' bgs)** N/A
Subsurface (vadose zone) 6

Predominant Soil Type in the Vadose Zone Medium to fine sand, silt, and trace clay

Groundcover Type grass/asphalt

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

N/A

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

				ANALYTES													
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 70	GT-301	SS-3	13 5-15 5	-	-	Sep-92	-	-	-	-	-	-	-	-	-	
	GT-302	S-3	8 5-10 5	-	-	Sep-92	-	-	-	-	-	-	-	-	-	
	GT-303	SS-1	3 5-5 55	-	-	Sep-92	-	-	-	-	-	-	-	-	-	
	GT-304	SS-3	13-15	-	-	Sep-92	-	-	-	-	-	-	-	-	-	
	GT-307	SS-2	8-10	-	-	Sep-92	-	-	-	-	-	-	-	-	-	
	GZ-301 to 307	comp		-	-	-	Sep-92	-	Sep-92	Sep-92	Sep-92	-	-	-	-	Soil - As, Ba, Cr, Pb, Ni exceedances

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations **Upgradient** 2
Downgradient 3

Depth to Groundwater **Minimum** 10.78 ft bgs (GT-302; 4/01)
Average 16.17 ft bgs
Maximum 23.02 ft bgs (GT-301; 9/95)

Depth to Bedrock 11 ft bgs

Preferential Pathways for Groundwater Migration ☑ Yes ☐ No
Describe: Fuel distribution lines; Ring drain system

Predominant Soil Type in the Saturated Zone Medium to fine sand, silt, and some clay

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

Source Area	Well Associated with Source Area	ANALYTES: TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 70	GT-301	Aug-97	Jan-95	-	Aug-97	Aug-97	-	-	-	-	-	-	-	
	GT-302	Aug-97	Jan-95	-	Aug-97	Aug-97	-	-	-	-	-	-	-	
	GT-303	Jun-99	Jan-95	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-	
	GT-304	Jun-99	Jan-95	-	Jun-99	Jan-96	Jun-99	Jun-99	-	-	-	-	-	
	GT-307	Jan-95	Jan-95	Jan-95	Jan-95	Jan-96	-	-	-	-	-	-	-	

NOTES
Shaded boxes indicate that there were other sampling events, with this being the most recent event

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid
Minimum Non Detect
Maximum Non Detect
Most Recent Non Detect

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
Tank 70	GT-301	ND	12/94 – 4/01
	GT-302	ND	12/94 – 4/01
	GT-303	ND	12/94 – 4/01
	GT-304	ND	12/94 – 6/99
	GT-307	ND	12/94 – 4/01

NOTES
ND = Not Dectected

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☑ Yes ☐ No

Number of Soil Gas Samples 1 (SG3-25)

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

******INSERT TABLE AS APPROPRIATE******

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations
Upstream N/A
Downstream N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples

Surface (0"-6" depth) N/A
Subsurface (> 6" depth) N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☑ Yes ☐ No

- ☐ Buildings
- ☐ Vaults
- ☑ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

Tank Number	Contents	Water Level (ft)	Sludge Layer (ft)	Product Layer (ft)	Date Sampled
70	JP-5	0 01	0 02	0 05	7/15/96

If an Underground Storage Tank
Date Cleaned 7/96
Date Closed 7/96

If Underground Distribution Lines
Date Cleaned _____
Date Plugged _____

Notes

- Before cleaning activities began, representative samples were collected from the contents of the tank for waste characterization
- Residual fuel and fluids were removed and the tank was cleaned with a water soluble, biodegradable degreaser
- After the degreaser had penetrated the residual fuel and sludge, the surfaces were rinse with water
- Residual wastewater, sludge, oils, and other debris were collected and removed from the tank via pumps and vacuum trucks to be transported off site to a disposal facility
- Accessible appurtenances associated with the tank (i.e., pumps, interior pipelines, vaults, etc.) were also cleaned
- After cleaning activities, a structural assessment and gas free assessment was completed on the tank
- The tank was certified gas free. Structurally, no holes or thinning were noted in the shell and the floor and roof were in good condition

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Tank 70	GT-301, 302, 303, 304, 307	Composite Soil Sample	Arsenic - 6 mg/kg (DC) (GT-301-307)	9/92
		Soil	BDC, BLC	9/92
		Groundwater	BGA	6/99
		Free Product	ND	6/99
NOTES BGA = Below GA Groundwater Objective BDC = Below Direct Contact BLC = Below Leaching Criteria				L = Leaching Criteria DC = Direct Contact ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil ☐ Yes ☐ No If so, which HS? _____

Groundwater ☐ Yes ☐ No If so, which HS? _____

Appendix B

Summary Evaluations for Areas of Potential Environmental Concern to be Evaluated

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

AREA Former Sand Filter

SIZE (approx.)

Length 50 ft **Width** 50 ft
Area 2,500 ft^2 0.057 acres

DESCRIPTION OF AREA AND PAST OPERATIONS

- Located northwest of Tank 32 near the fence
- Before 1974, waste from the cleaning of the tanks was pumped into the sand filter to be dischcharged into Narragansett Bay
- May have also received discharge from the ring drain system before the oil/water separator was installed
- Residual oil remaining in the sand filter was burned or scraped off and removed to an offsite location
- Removed, with some of the surrounding soils, in 1974

DISTANCE TO PROPERTY LINES (approx.)

☑	North	50 ft
☑	South	1,250 ft
☑	East	675 ft
☑	West	37.5 ft

REFERENCES

1. Environmental Site Investigation, Tank Farm 3. GZA (6/95)
2. Supplemental Site Investigation and Corrective Action Plan, Tank Farm 3. GZA (2/98)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☐	JP-4
2.	_____	☐	JP-5
3	_____	☐	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☑	Marine Diesel Fuel
6.	_____	☑	Tank Cleaning Wastes

RELEASE STATUS ☑ Confirmed Release ☐ Potential for Release

RELEASE SUMMARY (if applicable)

- Seepage of tank bottoms and sludge from sand filter (may have occurred and contaminated the shallow and deep soils or the groundwater in this area)
- After removal of sand filter and some of the surrounding soils, possibility that residue remains
- Burning of residual oil into outdoor air

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples **Surface (0'-2' bgs)** 1
Subsurface (vadose zone) 1

Predominant Soil Type in the Vadose Zone Silt and coarse to fine sand

Groundcover Type grass

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

				ANALYTES											
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Former Sand Filter	GZ-301	S-1	0 2-2 2	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

				ANALYTES											
Source Area	Boring Designation	Sampl e ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Former Sand Filter	GZ-332	S-2	5-6	Mar-97	-	-	Mar-97	Mar-97	-	-	-	-	-	-	-

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations **Upgradient** 1
Downgradient 1

Depth to Groundwater **Minimum** 13.10 ft bgs (GZ-301; 1/96)
Average 15.51 ft bgs
Maximum 18.78 ft bgs (GZ-332; 8/97)

Depth to Bedrock 8 ft bgs

Preferential Pathways for Groundwater Migration ☐ Yes ☑ No
Describe: _____

Predominant Soil Type in the Saturated Zone Severely weathered shale

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

		ANALYTES											
Source Area	Well Associated with Source Area	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Former Sand	GZ-301	-	-	-	Jan-95	Jan-96	-	-	-	-	-	-	-
Filter	GZ-332	Jun-97	Jun-97	-	Jun-97	-	-	-	-	-	-	-	-

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid
Minimum Non Detect
Maximum Non Detect
Most Recent Non Detect

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
Former Sand	GZ-301	ND	12/94 – 6/99
Filter	GZ-332	ND	4/97 – 4/01
NOTES ND = Not Dectected			

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☐ Yes ☑ No

Number of Soil Gas Samples N/A

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations
Upstream N/A
Downstream N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples
Surface (0"-6" depth) N/A
Subsurface (> 6" depth) N/A

Sediment Sampling Summary (0"-6" depth) [See Figure Y-Y for sampling locations]

N/A

Sediment Sampling Summary (> 6" depth) [See Figure Y-Y for sampling locations]

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☐ Yes ☑ No

- ☐ Buildings
- ☐ Vaults
- ☐ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary [See Figure Y-Y for sampling locations]

N/A

If an Underground Storage Tank **Date Cleaned** _____
Date Closed _____

If Underground Distribution Lines **Date Cleaned** _____
Date Plugged _____

Notes

_____
_____
_____
_____
_____
_____

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes

Former	GZ-301, 332	Soil	BDC, BLC	3/97
Sand		Groundwater	ND	6/97
Filter		Free Product	ND	4/01

NOTES
BGA = Below GA Groundwater Objective
BDC = Below Direct Contact
BLC = Below Leaching Criteria
L = Leaching Criteria
DC = Direct Contact
ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil ☐ Yes ☐ No If so, which HS? _____

Groundwater ☐ Yes ☐ No If so, which HS? _____

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

AREA Oil/Water Separator #3 / Collection UST

SIZE (approx.)
Length 34 ft **Width** 12.5 ft
Area 425 ft^2 0.0098 acres

DESCRIPTION OF AREA AND PAST OPERATIONS

- Installed after the sand filter was removed in 1974
- Located in the northwestern portion of the site near Tank 32
- The common drainage pipe that connects all of the tanks ring drain system is discharged to the oil/water separator
- Discharges to Lawton Brook at an RIPDES permitted outfall (No. 005)
- A 5,000 gallon UST is located adjacent to the oil/water separator and is used to store floating petroleum product that my accumulate in the oil/water separator

DISTANCE TO PROPERTY LINES (approx.)

☑	North	200 ft
☑	South	1,200ft
☑	East	650 ft
☑	West	225 ft

REFERENCES

1. Draft Tank Closure Assessment Report, Tank Farm 3. GZA (9/98)
2. Environmental Site Investigation, Tank Farm 3. GZA (6/95)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☑	JP-4
2.	_____	☑	JP-5
3.	_____	☑	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☑	Marine Diesel Fuel
6.	_____	☑	Tank Cleaning Wastes

RELEASE STATUS ☐ Confirmed Release ☑ Potential for Release

RELEASE SUMMARY (if applicable)

- Potential release (leak) of fuel from separator or UST into groundwater or soil

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples **Surface (0'-2' bgs)** N/A
Subsurface (vadose zone) 1

Predominant Soil Type in the Vadose Zone Coarse to fine sand and silt

Groundcover Type Crushed Rock

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

N/A

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

Source Area	Boring Designation	Sample ID	Sample Depth (ft)	ANALYTES											
				TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Oil/Water Separator #3/UST	GZ-303	S-4	17-19	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations **Upgradient** N/A
Downgradient 1

Depth to Groundwater **Minimum** 10.96 ft bgs (4/96)
Average 12.42 ft bgs
Maximum 13 87 ft bgs (7/97)

Depth to Bedrock 4 ft bgs

Preferential Pathways for Groundwater Migration ☑ Yes ☐ No
Describe: Buried pipelines

Predominant Soil Type in the Saturated Zone Highly weathered shale

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

Source Area	Well Associated with Source Area	ANALYTES											
		TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Oil/Water Separator #3/UST	GZ-303	Jun-99	Jan-95	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid

Minimum	Non Detect
Maximum	Non Detect
Most Recent	Non Detect

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
Oil / Water Separator #3/UST	GZ-303	ND	12/94 – 4/01
NOTES ND = Not Dectected			

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☑ Yes ☐ No

Number of Soil Gas Samples 3 (SG3-1, 2, and 14)

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations

Upstream	N/A
Downstream	N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples

Surface (0"-6" depth)	N/A
Subsurface (> 6" depth)	N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☐ Yes ☑ No

- ☐ Buildings
- ☐ Vaults
- ☐ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

If an Underground Storage Tank **Date Cleaned** _____
Date Closed _____

If Underground Distribution Lines **Date Cleaned** _____
Date Plugged _____

Notes

_____
_____
_____
_____
_____
_____

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Oil/Water Separator #3/UST	GZ-303	Soil	BDC, BLC	11/94
		Groundwater	BGA	6/99
		Free Product	ND	4/01

NOTES
BGA = Below GA Groundwater Objective
BDC = Below Direct Contact
BLC = Below Leaching Criteria
L = Leaching Criteria
DC = Direct Contact
ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil ☐ Yes ☐ No If so, which HS? _____

Groundwater ☐ Yes ☐ No If so, which HS? _____

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

AREA Outdoor Electrical Transformer

SIZE (approx.)

Length 75 ft **Width** 25 ft
Area 1,875 ft^2 0.043 acres

DESCRIPTION OF AREA AND PAST OPERATIONS

- Located in the southwest portion of the site

DISTANCE TO PROPERTY LINES (approx.)

☑ North 775 ft
☑ South 350 ft
☑ East 1,200 ft
☑ West 425 ft

REFERENCES

1. Environmental Site Investigation, Tank Farm 3. GZA (6/95)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	PCBs in transformer oil	☐	JP-4
2.	_____	☐	JP-5
3.	_____	☐	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☐	Other _____

RELEASE STATUS ☐ Confirmed Release ☑ Potential for Release

RELEASE SUMMARY (if applicable)

- Unknown potential for PCB leakage

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples **Surface (0'-2' bgs)** 1
Subsurface (vadose zone) N/A

Predominant Soil Type in the Vadose Zone Coarse to fine sand and grvel

Groundcover Type grass

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

				ANALYTES											
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Transformer	GZ-314	S-1	0-2	Nov-94	Nov-94	-	Nov-94	-	-	Nov-94	-	-	-	-	-

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations **Upgradient** N/A
Downgradient 1

Depth to Groundwater **Minimum** 16.22 ft bgs (4/96)
Average 21 12 ft bgs
Maximum 26.02 ft bgs (1/95)

Depth to Bedrock 12 ft bgs

Preferential Pathways for Groundwater Migration ☐ Yes ☑ No
Describe: _____

Predominant Soil Type in the Saturated Zone Shale

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

		ANALYTES											
Source Area	Well Associated with Source Area	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})
Transformer	GZ-314	Jun-99	Jan-95	-	Jun-99	Jan-96	Jun-99	Jun-99	-	-	-	-	-
NOTES Shaded boxes indicate that there were other sampling events, with this being the most recent event													

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid
Minimum Non Detect
Maximum Non Detect
Most Recent Non Detect

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
Transformer	GZ-314	ND	12/94 – 4/01
NOTES ND = Not Dectected			

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☐ Yes ☑ No

Number of Soil Gas Samples N/A

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations
Upstream N/A
Downstream N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples
Surface (0"-6" depth) N/A
Subsurface (> 6" depth) N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☐ Yes ☑ No

- ☐ Buildings
- ☐ Vaults
- ☐ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

If an Underground Storage Tank **Date Cleaned** _____
Date Closed _____

If Underground Distribution Lines **Date Cleaned** _____
Date Plugged _____

Notes

_____
_____
_____
_____
_____
_____

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Transformer	GZ-314	Soil	ND	11/94
		Groundwater	BGA	6/99
		Free Product	ND	4/01
NOTES BGA = Below GA Groundwater Objective BDC = Below Direct Contact BLC = Below Leaching Criteria				L = Leaching Criteria DC = Direct Contact ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil	☐ Yes	☐ No	If so, which HS? _____
Groundwater	☐ Yes	☐ No	If so, which HS? _____

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

AREA Sludge Pit

SIZE (approx.)
Length 140 ft **Width** 75 ft
Area 10,500 ft^2 0.24 acres

DESCRIPTION OF AREA AND PAST OPERATIONS

- There is one sludge pit at Tank Farm 3 where all of the sludge from Tanks 69 and 70 were buried.
- It is located to the SE of the Electrical Control House. The burial occurred when the Navy owned the property (until the early 1970s) before DESC began leasing it.

DISTANCE TO PROPERTY LINES (approx.)

☑	North	950 ft
☑	South	1,250 ft
☑	East	225 ft
☑	West	950 ft

REFERENCES

1. Site visit and interview with Mr. Dick Lambert – former Superintendent of DFSP Melville. Foster Wheeler Environmental Corporation (7/02)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☐	JP-4
2.	_____	☑	JP-5
3.	_____	☑	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☑	Other: Marine Diesel Fuel

RELEASE STATUS ☐ Confirmed Release ☐ Potential for Release

RELEASE SUMMARY (if applicable)

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples **Surface (0'-2' bgs)** N/A
Subsurface (vadose zone) 1

Predominant Soil Type in the Vadose Zone Coarse to fine sand and gravel

Groundcover Type grass

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

N/A

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

				ANALYTES												
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Sludge Pit	GZ-317			Dec-95	-	-	-	-	-	-	-	-	-	-	-	

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations
Upgradient N/A
Downgradient 1

Depth to Groundwater
Minimum 12.15 ft
Average 13.88 ft
Maximum 15.38 ft

Depth to Bedrock 7.5 ft

Preferential Pathways for Groundwater Migration ☐ Yes ☐ No
Describe: _____

Predominant Soil Type in the Saturated Zone _____

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

		ANALYTES												
Source Area	Well Associated with Source Area	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Sludge Pit	GZ-317	Jan-96	Jan-96	-	Jan-96	Jan-96	-	-	-	-	-	-	-	

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid
Minimum N/A
Maximum N/A
Most Recent N/A

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

N/A

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☑ Yes ☐ No

Number of Soil Gas Samples SG3-23 and SG3-24

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations **Upstream** N/A
Downstream N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples **Surface (0"-6" depth)** N/A
Subsurface (> 6" depth) N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☐ Yes ☑ No

- ☐ Buildings
- ☐ Vaults
- ☐ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

If an Underground Storage Tank **Date Cleaned** _____
Date Closed _____

If Underground Distribution Lines **Date Cleaned** _____
Date Plugged _____

Notes

_____
_____
_____
_____
_____
_____

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Sludge Pit	317	Soil	BDC, BLC	12/95
		Groundwater	BGA	1/96
		Free Product	ND	12/95 – 6/99
NOTES BGA = Below GA Groundwater Objective BDC = Below Direct Contact BLC = Below Leaching Criteria				L = Leaching Criteria DC = Direct Contact ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil ☐ Yes ☐ No If so, which HS? _____
_____
_____

Groundwater ☐ Yes ☐ No If so, which HS? _____
_____
_____

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

AREA Tank 35

SIZE (approx.)

Length	350 ft	**Width** 200 ft	**Height** 33.5 ft
Area	70,000 ft^2	1.61 acres	**Diameter** 116 ft

DESCRIPTION OF AREA AND PAST OPERATIONS

- Installed in the early 1940s
- 1.18 million gallon concrete UST located about 5 feet below grade
- Ring drains are located around the tank 6 feet above the bottom of the tank and are connected to a common drainage pipe that discharges to the oil/water separator located near Tank 32
- Located around the tank is a valve pit, a gauging port and stripper pump, and an access hatch and pump
- Stored marine diesel fuel in the early 1940s, JP-5 between 1978 and 1986, and JP-8 in 1994
- After periodic cleanings, the tank bottoms were stripped and the water was discharged to the oil/water separator (or sand filter before it was removed), although, there was a potential for water discharged onto the ground surface
- The tank was closed and steam cleaned in July of 1996
- On September 2, 1999, excavation began on the east side of Tank 35 to remove soil contaminated by a surficial oil spill. 1,200 yards of soil were removed. On October 6, 1999, more soil was removed where TPH screening was exceeded.

DISTANCE TO PROPERTY LINES (approx.)

☑	North	925 ft
☑	South	450 ft
☑	East	850 ft
☑	West	775 ft

REFERENCES

1. Draft Tank Closure Assessment Report, Tank Farm 3. GZA (9/98)
2. Tank Farm 3 Soil Removal Activities in the Vicinity of Tank 35. FWENC (2/00)
3. Environmental Site Investigation, Tank Farm 3. GZA (6/95)
4. Supplemental Site Investigation, Tank Farm 3. GZA (9/96)
5. Supplemental Site Investigation and Corrective Action Plan, Tank Farm 3. GZA (2/98)
6. Quarterly Monitoring Report, Tank Farm 3. GZA (2/98)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☐	JP-4
2.	_____	☑	JP-5
3.	_____	☑	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☑	Marine Diesel Fuel

RELEASE STATUS ☑ Confirmed Release ☐ Potential for Release

RELEASE SUMMARY (if applicable)

- Surficial spill in the early 1980s after tank was overfilled with JP-5. Approximately 50,000 to 60,000 gallons were spilled and about 4,000 gallons were recovered.
- Potential release of tank bottoms to ground surface instead of sand filter or oil/water separator
- Possible burial of tank sludge

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples **Surface (0'-2' bgs)** 14
Subsurface (vadose zone) 27

Predominant Soil Type in the Vadose Zone Coarse to fine sand and weathered shale

Groundcover Type grass/asphalt

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

				ANALYTES												
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 35	GZ-350	S-1	0-2	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-	(blind duplicate of GZ-310)
	GZ-324	S-1	0-2	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	GZ-326	S-1	0-2	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	GZ-327	S-1	0-2	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	B-1	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-2	S-1	0-2	Dec-95	-	-	Dec-95	Dec-95	-	-	-	-	-	-	-	
	B-3	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-4	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-5	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-6	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-7	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-8	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-9	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-10	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-50	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	(blind duplicate of B-6)

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

				ANALYTES												
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 35	GZ-308	S-3	10-12	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-	
	GZ-309	S-1A	3-4	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-	
	GZ-310	S-3	10-12	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-	
	GZ-315	S-2	5-7	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-	
	GZ-324	S-2	5-7	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	GZ-324	S-3	8-10	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	GZ-326	S-2	5-7	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	GZ-326	S-3	9-11	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	GZ-327	S-2	5-7	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	B-1	S-2	5-7	Dec-95	-	-	Dec-95	Dec-95	-	-	-	-	-	-	-	
	B-1	S-3	10-12	Dec-95	-	-	-	-	-	-	-	-	-	-	-	

				ANALYTES												
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 35	B-2	S-2	5-7	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-2	S-3	10-12	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-3	S-2	5-7	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-3	S-3	10-12	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-4	S-2	5-7	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-5	S-2	5-7	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-5	S-3	10-12	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-6	S-2	5-7	Dec-95	-	-	Dec-95	Dec-95	-	-	-	-	-	-	-	
	B-6	S-3	10-12	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-7	S-2	5-7	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-7	S-3	10-12	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-8	S-2	5-7	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-9	S-2	5-7	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-9	S-3	10-12	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-10	S-2	5-7	Dec-95	-	-	Dec-95	Dec-95	-	-	-	-	-	-	-	
	B-10	S-3	10-12	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-51	S-2	5-7	Dec-95	-	-	Dec-95	Dec-95	-	-	-	-	-	-	-	(blind dup B-1)
	SSW2A	-	5	Oct-99	-	-	Oct-99	-	Oct-99	-	Oct-99	-	-	-	-	
	NSW2	-	5	-	-	-	-	-	Oct-99	-	Oct-99	-	-	-	-	
	ESW1	-	5	-	-	-	-	-	Oct-99	-	Oct-99	-	-	-	-	
	SSW1	-	5	-	-	-	-	-	Oct-99	-	Oct-99	-	-	-	-	
	NSW1	-	8	Oct-99	-	-	Oct-99	-	Oct-99	-	Oct-99	-	-	-	-	
	SS01	-		Oct-99	-	-	Oct-99	-	Oct-99	-	Oct-99	-	-	-	-	
	SS02	-		-	-	-	-	-	Oct-99	-	Oct-99	-	-	-	-	
	SS03	-		Oct-99	-	-	Oct-99	-	Oct-99	-	Oct-99	-	-	-	-	
	SS04	-		Oct-99	-	-	Oct-99	-	Oct-99	-	Oct-99	-	-	-	-	

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations
Upgradient N/A
Downgradient 11 plus 1 recovery well

Depth to Groundwater
Minimum 9.54 ft bgs (GZ-315; 4/01)
Average 18.57 ft bgs
Maximum 27.60 ft bgs (GZ-309; 9/95)

Depth to Bedrock 9 ft bgs

Preferential Pathways for Groundwater Migration ☑ Yes ☐ No
Describe: Fuel distribution lines; Ring drain system

Predominant Soil Type in the Saturated Zone High to moderately weathered shale

Groundwater Sampling Summary
[See Figure Y-Y for sampling locations]

ANALYTES

Source Area	Well Associated with Source Area	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank 35	GZ-308	Jul-97	Jan-95	-	Jul-97	Jul-97	-	-	-	-	-	-	-	
	GZ-309	Jun-99	Jan-95	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-	Removed in 6/99
	GT-310	Jan-95	Jan-95	-	Jan-95	-	-	-	-	-	-	-	-	Duplicate of GZ-309
	GZ-310	Jan-95	Jan-95	-	Jan-95	Jan-96	-	-	-	-	-	-	-	GW - Naphthalene exceedance (1/96), Free Product measured (6/99)
	GZ-315	Jun-99	Jan-95	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-	
	GZ-324	Jan-96	Jan-96	-	Jan-96	Jan-96	-	-	-	-	-	-	-	
	GZ-325	Jun-99	Jan-96	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-	
	GZ-326	Jun-99	Jan-96	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-	
	GZ-327	Jun-99	Jan-96	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-	
	GZ-333	-	-	-	-	-	-	-	-	-	-	-	-	
	GZ-334	-	-	-	-	-	-	-	-	-	-	-	-	
	GZ-335	-	-	-	-	-	-	-	-	-	-	-	-	Free Product Measured (6/99)
	RW-301	Jul-97	Jul-97	-	Jul-97	-	Jul-97	-	Jul-97	-	-	-	-	

NOTES
Shaded boxes indicate that there were other sampling events, with this being the most recent event

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☑ Yes ☐ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid

Minimum 0 12 inches (GZ-310 and GZ-325)
Maximum 7.56 inches (GZ-310; 5/95)
Most Recent 0 24 inches (GZ-310; 6/99)

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
Tank 35	GZ-308	ND	12/94 – 6/99
	GZ-309	ND	12/94 – 6/99
	GZ-310	0 33	12/94
		0 22	1/95
		0 25	2/95
		0 34	3/95
		0 56	4/95
		0 63	5/95
		0 51	6/95
		0 43	7/95
		0 08	8/95
		0 14	9/95
		0 32	10/95
		0 19	11/95
		0 10	12/95
		0 05	1/96
		0 04	2/96 – 4/96
		0 05	5/96
		0 04	6/96
		0 07	7/96
		0 06	8/96
		0 09	9/96
		0 10	10/96
		0 11	11/96
		0 01	12/96
		ND	1/97
		0 01	2/97
		0 03	3/97

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
		ND	4/97
		0 04	5/97
	GZ-310	0 02	6/97
		ND	7/97
		0 01	8/97
		ND	9/97
		0 02	6/99
	GZ-315	ND	12/94 – 2/95
		0 01	3/95
		ND	4/95 – 6/99, 1/01 – 2/01, 4/01
	GZ-324	ND	12/95 – 4/01
	GZ-325	0 01	12/95
		0 02	1/96
		SHEEN	2/96
		0 01	3/96
		ND	4/96
		0 01	5/96
		ND	6/96
		0 08	7/96
		0 12	8/96
		0 01	9/96
		ND	1096 – 4/97
		0 01	5/97
		ND	6/97 – 4/01
	GZ-326	ND	12/95 – 6/99
	GZ-327	ND	12/95 – 6/99
	GZ-333	ND	4/97 – 6/99
	GZ-334	ND	4/97 – 6/99
	GZ-335	ND	4/97 – 9/97
		0 03	6/99
		ND	2/01 – 4/01
	RW-301	ND	6/97 – 4/01

NOTES
ND = Not Dectected

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☑ Yes ☐ No

Number of Soil Gas Samples 4 (SG3-10 to 13)

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

****INSERT TABLE AS APPROPRIATE****

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations **Upstream** N/A
Downstream N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples — Surface (0"-6" depth) N/A; Subsurface (> 6" depth) N/A

Sediment Sampling Summary (0"-6" depth) [See Figure Y-Y for sampling locations]

N/A

Sediment Sampling Summary (> 6" depth) [See Figure Y-Y for sampling locations]

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☑ Yes ☐ No

- ☐ Buildings
- ☐ Vaults
- ☑ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary [See Figure Y-Y for sampling locations]

Tank Number	Contents	Water Level (ft)	Sludge Layer (ft)	Product Layer (ft)	Date Sampled
35	JP-8	0 01	-	0 03	7/19/96

If an Underground Storage Tank — Date Cleaned 7/96; Date Closed 7/96

If Underground Distribution Lines — Date Cleaned _____; Date Plugged _____

Notes

- Before cleaning activities began, representative samples were collected from the contents of the tank for waste characterization
- Residual fuel and fluids were removed and the tank was cleaned with a water soluble, biodegradable degreaser
- After the degreaser had penetrated the residual fuel and sludge, the surfaces were rinsed with water
- Residual wastewater, sludge, oils, and other debris were collected and removed from the tank via pumps and vacuum trucks to be transported off site to a disposal facility
- Accessible appurtenances associated with the tank (i.e., pumps, interior pipelines, vaults, etc.) were also cleaned
- After cleaning activities, a structural assessment and gas free assessment was completed on the tank
- The tank was certified gas free. Structurally, several stress cracks were found on the floor and along the chine, however, no evidence of flowing water was found. Also, several cracks were found on the roof, however, there no notable water flow was evident.

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Tank 35	GZ-308, 309, 310, 315, 324, 325, 326, 327, 333, 334, 335, RW-301, B-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 51	Soil (0-2')	Removed	9/99 - soil removal adjacent to tank 35 (B-1-4) -30'x70'x10' deep and replaced with clean backfill
		Soil (3-4')	Removed	9/99 - soil removal adjacent to tank 35 (B-1-4) -30'x70'x10' deep and replaced with clean backfill
		Soil (5-7')	TPH - 940 mg/kg (B-6, 12/95)	9/99 - soil removal adjacent to tank 35 (B-1-4) -30'x70'x10' deep and replaced with clean backfill
		Soil (10-12')	TPH - 3200 mg/kg (GZ-310, 11/94), TPH - 2200 mg/kg (GZ-350-dup of GZ-310 (0-2'), 11/94), TPH - 540 mg/kg (B-6 , 12/95)	9/99 - soil removal adjacent to tank 35 (B-1-4) -30'x70'x10' deep and replaced with clean backfill
		Groundwater	Naphthalene - 0 031 mg/L (GZ-310, 1/96)	GZ-333-335 and RW-301 = aquifer pump test, GZ-309 was removed (9/99)
		Free Product	0 02 ft (GZ-310, 6/99)	Free Product was measured in GZ-335 once in 1999 but not recently, GZ-310 has not been gauged since 6/99
NOTES BGA = Below GA Groundwater Objective BDC = Below Direct Contact BLC = Below Leaching Criteria				L = Leaching Criteria DC = Direct Contact ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☑ Yes ☐ No

Soil ☐ Yes ☐ No If so, which HS? _____

_____

_____

Groundwater ☑ Yes ☐ No If so, which HS? Non-Aqueous Phase Liquid
0.02 ft (GZ-310; 6/99)

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

AREA Tank Cleaning Wastes

SIZE (approx.)
Length 180 ft **Width** 180 ft
Area 32,400 ft^2 0.74 acres

DESCRIPTION OF AREA AND PAST OPERATIONS

- Standard practice was for the crew to hook a hose up to the stripping pump piping and run the hose across the road to discharge.
- Most of the discharge from tanks at TF3 would discharge into the center of the circular road located northwest of Tank 36 and northeast of Tank 35.

DISTANCE TO PROPERTY LINES (approx.)

☑	North	950 ft
☑	South	550 ft
☑	East	425 ft
☑	West	1,000 ft

REFERENCES

1. Site visit and interview with Mr. Dick Lambert – former Superintendent of DFSP Melville. Foster Wheeler Environmental Corporation (8/01)

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☐	JP-4
2.	_____	☑	JP-5
3.	_____	☑	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☑	Other: Marine Diesel Fuel

RELEASE STATUS ☐ Confirmed Release ☐ Potential for Release

RELEASE SUMMARY (if applicable)

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples	**Surface (0'-2' bgs)**	8
	Subsurface (vadose zone)	15

Predominant Soil Type in the Vadose Zone Coarse to fine sand and weathered shale

Groundcover Type grass

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

				ANALYTES													
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank Cleaning Wastes	GZ-350	S-1	0-2	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-	(blind duplicate of GZ-310)
	GZ-324	S-1	0-2	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	GZ-326	S-1	0-2	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	GZ-327	S-1	0-2	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	B-6	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-7	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-8	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-9	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-10	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-50	S-1	0-2	Dec-95	-	-	-	-	-	-	-	-	-	-	-	(blind duplicate of B-6)

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

				ANALYTES												
Source Area	Boring Designation	Sample ID	Sample Depth (ft)	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank Cleaning Wastes	GZ-310	S-3	10-12	Nov-94	Nov-94	-	Nov-94	-	-	-	-	-	-	-	-	
	GZ-324	S-2	5-7	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	GZ-324	S-3	8-10	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	GZ-326	S-2	5-7	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	GZ-326	S-3	9-11	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	GZ-327	S-2	5-7	Nov-95	-	-	-	-	-	-	-	-	-	-	-	
	B-6	S-2	5-7	Dec-95	-	-	Dec-95	Dec-95	-	-	-	-	-	-	-	
	B-6	S-3	10-12	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-7	S-2	5-7	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-7	S-3	10-12	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-8	S-2	5-7	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-9	S-2	5-7	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-9	S-3	10-12	Dec-95	-	-	-	-	-	-	-	-	-	-	-	
	B-10	S-2	5-7	Dec-95	-	-	Dec-95	Dec-95	-	-	-	-	-	-	-	
	B-10	S-3	10-12	Dec-95	-	-	-	-	-	-	-	-	-	-	-	

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations
Upgradient 4
Downgradient 4

Depth to Groundwater
Minimum 11.62 (GZ-333, 6/02)
Average 16.36
Maximum 21.10 (GZ-333, 7/02)

Depth to Bedrock 10.5 ft

Preferential Pathways for Groundwater Migration ☐ Yes ☐ No
Describe: _____

Predominant Soil Type in the Saturated Zone _____

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

Source Area	Well Associated with Source Area	TPH	TVPH	BETX	VOCs	PAHs	SVOCs	PCBs/ Pest	Metals	Base Neutrals/ Acids	Oil and Grease	Aliphatic (C_4-C_{12})	Aromatic (C_8-C_{10})	Notes
Tank Cleaning Wastes	GZ-310	Jan-95	Jan-95	-	Jan-95	Jan-96	-	-	-	-	-	-	-	GW - Naphthalene exceedance (1/96), Free Product measured (6/99)
	GZ-324	Jan-96	Jan-96	-	Jan-96	Jan-96	-	-	-	-	-	-	-	
	GZ-325	Jun-99	Jan-96	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-	
	GZ-326	Jun-99	Jan-96	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-	
	GZ-327	Jun-99	Jan-96	-	Jun-99	Jan-96	Jun-99	-	-	-	-	-	-	
	GZ-333	-	-	-	-	-	-	-	-	-	-	-	-	
	GZ-334	-	-	-	-	-	-	-	-	-	-	-	-	
	GZ-335	-	-	-	-	-	-	-	-	-	-	-	-	Free Product Measured (6/99)

NOTES
Shaded boxes indicate that there were other sampling events, with this being the most recent event

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid

Minimum	0.01
Maximum	0.01
Most Recent	ND

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
Tank Cleaning Wastes	GZ-310	0 33	12/94
		0 22	1/95
		0 25	2/95
		0 34	3/95
		0 56	4/95
		0 63	5/95
		0 51	6/95
		0 43	7/95
		0 08	8/95
		0 14	9/95
		0 32	10/95
		0 19	11/95
		0 10	12/95
		0 05	1/96
		0 04	2/96 – 4/96
		0 05	5/96
		0 04	6/96
		0 07	7/96
		0 06	8/96
		0 09	9/96
		0 10	10/96
		0 11	11/96
		0 01	12/96
		ND	1/97
		0 01	2/97
		0 03	3/97
	GZ-310	ND	4/97
		0 04	5/97
		0 02	6/97
		ND	7/97

Source Area	Well / Boring Associated with Source Area	Free Product Thickness (ft)	Date Measured
		0 01	8/97
		ND	9/97
		0 02	6/99
	GZ-324	ND	12/95 – 4/01
	GZ-325	0 01	12/95
		0 02	1/96
		SHEEN	2/96
		0 01	3/96
		ND	4/96
		0 01	5/96
		ND	6/96
		0 08	7/96
		0 12	8/96
		0 01	9/96
		ND	1096 – 4/97
		0 01	5/97
		ND	6/97 – 4/01
	GZ-326	ND	12/95 – 6/99
	GZ-327	ND	12/95 – 6/99
	GZ-333	ND	4/97 – 6/99
	GZ-334	ND	4/97 – 6/99
	GZ-335	ND	4/97 – 9/97
		0 03	6/99
		ND	2/01 – 4/01
NOTES ND = Not Dectected			

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☐ Yes ☑ No

Number of Soil Gas Samples N/A

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations **Upstream** N/A
Downstream N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples **Surface (0"-6" depth)** N/A
Subsurface (> 6" depth) N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☐ Yes ☑ No

- ☐ Buildings
- ☐ Vaults
- ☐ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

If an Underground Storage Tank **Date Cleaned** _____
Date Closed _____

If Underground Distribution Lines **Date Cleaned** _____
Date Plugged _____

Notes

_____
_____
_____
_____
_____
_____

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Source Area	Well / Boring Associated with Source Area	Media	Concentration	Notes
Tank Cleaning Wastes	GZ-324, 326, 327, 328, 350, B-6, 7, 8, 9, 10, 50	Soil (0-2')	BDC TPH – 14 mg/kg (GZ-326, 11/95), TPH – 43 mg/kg (B-7, 12/95), TPH - 2200 mg/kg (GZ-350-dup of GZ-310 (0-2'), 11/94)	11/94, 12/95
	GZ-324, 326, 327, B-6, 7, 8, 9, 10	Soil (5-7')	BDC TPH – 940 mg/kg (B-6, 12/95), Volatile/Semi-volatile Organic Compounds (B-6, 12/95) BLC Naphthalene – 0 017 mg/kg (B-6, 12/95)	12/95
	GZ-324	Soil (8-10')	ND	11/95
	GZ-326	Soil (9-11')	ND	11/95
	GZ-310, B-6, 7, 9, 10	Soil (10-12')	TPH – 3200 mg/kg (GZ-310, 11/94), BDC TPH - 540 mg/kg (B-6 , 12/95)	GZ-310 TPH exceeds TPH Direct Contact Criteria
	GZ-310, 324, 325, 326, 327, 328, 333, 334, 335	Groundwater	Naphthalene – 0 031 mg/L (GZ-310, 1/96), 0 115 mg/L (GZ-325, 6/99) – Exceeds GA Bis(2-ethylhexyl)phthalate – 0 30 mg/L (GZ-325, 6/99), 0 004 mg/L (GZ-328, 6/99) – below GA	GZ-333-335 – aquifer pump test
	GZ-310, 324, 325, 326, 327, 328, 333, 334, 335	Free Product	0 02 ft (GZ-310, 6/99)	Free Product was measured in GZ-335 once in 1999 but not recently, GZ-310 has not been gauged since 6/99

NOTES
BGA = Below GA Groundwater Objective
BDC = Below Direct Contact
BLC = Below Leaching Criteria
L = Leaching Criteria
DC = Direct Contact
ND = Non Detect

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil ☐ Yes ☐ No If so, which HS? _____

Groundwater ☐ Yes ☐ No If so, which HS? _____

SECTION 1 POSSIBLE SOURCE AREA IDENTIFICATION

SITE Tank Farm 3

AREA Valve House

SIZE (approx.)

Length 25ft **Width** 9.37 ft
Area 234.25 ft^2 0.0054 acres

DESCRIPTION OF AREA AND PAST OPERATIONS

- Located in the northeast portion of the site on the petroleum distribution lines
- Structure 228

DISTANCE TO PROPERTY LINES (approx.)

☑	North	450 ft
☑	South	1,200 ft
☑	East	775 ft
☑	West	725 ft

REFERENCES

1. _____
2. _____

HAZARDOUS SUBSTANCES ASSOCIATED WITH THE POSSIBLE SOURCE AREA / PAST CONTENTS OF TANKS

1.	_____	☐	JP-4
2.	_____	☐	JP-5
3.	_____	☐	JP-8
4.	_____	☐	No. 6 Fuel Oil
5.	_____	☐	Other _____

RELEASE STATUS ☐ Confirmed Release ☑ Potential for Release

RELEASE SUMMARY (if applicable)

- Potential for leaks to occur above grade to surficial soil on site

SECTION 2 SUMMARY OF PAST INVESTIGATIONS AND SAMPLING

SECTION 2.1 SOIL

Number of Soil Samples
Surface (0'-2' bgs) N/A
Subsurface (vadose zone) N/A

Predominant Soil Type in the Vadose Zone _____

Groundcover Type grass

Potential for Wind / Water Erosion (circle) ☐ Yes ☐ No

Surface Soil Sampling Summary (0'-2' bgs) **[See Figure Y-Y for sampling locations]**

N/A

Subsurface Soil Sampling Summary (vadose zone) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.2 GROUNDWATER

Groundwater Classification ☐ GA/GAA ☑ GA/GAA Non-Attainment ☐ GB

Number of Groundwater Sampling Locations
Upgradient N/A
Downgradient N/A

Depth to Groundwater
Minimum N/A
Average N/A
Maximum N/A

Depth to Bedrock N/A

Preferential Pathways for Groundwater Migration ☑ Yes ☐ No
Describe: Fuel Distribution Lines

Predominant Soil Type in the Saturated Zone _____

Groundwater Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.3 FREE LIQUID

Free Liquids Present on the Surface ☐ Yes ☑ No

Non-Aqueous Phase Liquid Present in Any Environmental Medium ☐ Yes ☑ No
(**NOTE**: Considered a condition that exceeds the UCLs)

Historical Thickness of Free Liquid

Minimum	N/A
Maximum	N/A
Most Recent	N/A

Free Liquid Gauging Summary **[See Figure Y-Y for gauging locations]**

N/A

SECTION 2.4 SOIL GAS

Soil Gas Sampled in this Area ☐ Yes ☑ No

Number of Soil Gas Samples 1 (SG3-17)

Soil Gas Sampling Summary **[See Figure Y-Y for sampling locations]**

****INSERT TABLE AS APPROPRIATE****

SECTION 2.5 SURFACE WATER

Surface Water Classification N/A

Number of Surface Water Sampling Locations

Upstream	N/A
Downstream	N/A

Average Depth of Flow N/A

Surface Water Sampling Summary **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.6 SEDIMENT

Number of Sediment Samples

Surface (0"-6" depth)	N/A
Subsurface (> 6" depth)	N/A

Sediment Sampling Summary (0"-6" depth) **[See Figure Y-Y for sampling locations]**

N/A

Sediment Sampling Summary (> 6" depth) **[See Figure Y-Y for sampling locations]**

N/A

SECTION 2.7 MAN-MADE STRUCTURES

Any Occupiable Enclosed Structures in this Area ☐ Yes ☑ No

Man-Made Structures Sampled in this Area ☐ Yes ☑ No

- ☐ Buildings
- ☐ Vaults
- ☐ Tanks
- ☐ Pits
- ☐ Other _____

Man-Made Structure Sampling Summary **[See Figure Y-Y for sampling locations]**

******INSERT TABLE AS APPROPRIATE******

If an Underground Storage Tank **Date Cleaned** _____
Date Closed _____

If Underground Distribution Lines **Date Cleaned** _____
Date Plugged _____

Notes

_____
_____
_____
_____
_____
_____

SECTION 2.8 OTHER

Odors Present ☐ Yes ☑ No

Stained Soil Present ☐ Yes ☑ No

Stressed Vegetation Present ☐ Yes ☑ No

Excavated or Stockpiled Material Present ☐ Yes ☑ No
If so, Estimated Volume _____ CY

SECTION 3 SUMMARY OF CURRENT CONDITIONS

Upper Concentration Limits Exceeded for Any Hazardous Substances ☐ Yes ☑ No

Soil ☐ Yes ☐ No If so, which HS? _____
_____
_____

Groundwater ☐ Yes ☐ No If so, which HS? _____
_____
_____