

**REMOVAL PROGRAM
PRELIMINARY ASSESSMENT/
SITE INVESTIGATION REPORT
FOR THE
MURPHY PROPERTY (263 SALEM STREET) SITE
WOBURN, MIDDLESEX COUNTY, MASSACHUSETTS
25 JULY 2006 AND 23 AUGUST 2006**

Prepared For:

U.S. Environmental Protection Agency
Region I
Emergency Planning and Response Branch
1 Congress Street, Suite 1100
Boston, MA 02114-2023

CONTRACT NO. EP-W-05-042

TDD NO. 01-06-07-0008

TASK NO. 0219

DC NO. R-4420

Submitted By:

Weston Solutions, Inc.
Region I
Superfund Technical Assessment and Response Team (START)
3 Riverside Drive
Andover, MA 01810

November 2006

TABLE OF CONTENTS

- I. Preliminary Assessment/Site Investigation Forms
- II. Narrative Chronology
- III. Appendices
 - Appendix A - Figures
 - Appendix B - Tables and Spreadsheets
 - Appendix C - Photodocumentation Log
 - Appendix D - Chain-of-Custody Record

I. Preliminary Assessment/Site Investigation Forms

REMOVAL PRELIMINARY ASSESSMENT

Potential Responsible Parties

Owner: Joan Murphy **Telephone:**(781) 272-8188
Address: 41 Harriet Avenue, Burlington, MA 01803

Operator: N/A **Telephone:**()
Address:

Site Access

Authorizing Person: Joan Murphy
Date: 22 June 2006 **(X)Obtained** **()Verbal**
Telephone: (781) 272-8188 **()Not Obtained** **(X)Written**

Historical Preservation

() Site is Historically Significant or Eligible for Historic Preservation

Contacts Identified

- 1) State Historical Preservation Officer (SHPO)
Name: **Telephone:**()
- 2) Tribal Historical Preservation Officer (THPO)
Name: **Telephone:**()

Comments:

Physical Site Characterization

Background Information: The Murphy Property (263 Salem Street) site (the site) is located at 263 Salem Street, Woburn, Middlesex County, Massachusetts. It is bounded to the north by Salem Street and commercial properties (including Murphy's Waste Oil Services, Former Whitney Barrel Company, Aberjona Auto Parts); to the west by commercial property (Dondero Property); to the south by commercial property (MIRRA Realty Trust Property at 271 Salem Street); and to the east by the 271 Salem Street access road and additional commercial properties. The site is approximately 1 acre, and contains an unoccupied, three-story house; a garage; a 75,000-gallon (75K) waste oil bunker; a 15,000-gallon (15K) waste oil bunker; and several underground storage tanks (USTs) and aboveground storage tanks (ASTs). There is a semi-circular, unpaved driveway that begins and ends on Salem Street, and which extends around the house and leads to the garage. The property slopes up from Salem Street to the north and west, and includes areas of unmaintained lawn and some heavy brush. The garage contains several vehicles and miscellaneous equipment; and the southwest portion of the property is used for storage of construction equipment.

The site was formerly used as an oil and waste oil storage/transfer facility, beginning in the 1920s. All operations and use of the site as a waste oil storage/transfer facility ceased in 1987. Tank contents were reportedly removed during the early 1990s.

REMOVAL PRELIMINARY ASSESSMENT

Physical Site Characterization (Continued)

In 1989, 1990, and 1993, environmental investigations were conducted at the adjacent 271 Salem Street property. Monitoring wells were installed during these investigations, and groundwater, soil, and tank samples were collected. Analytical results from these samples indicated that the soil and groundwater had been impacted by petroleum hydrocarbons and Number (No). 2 fuel/lubricating oils. One of the investigations, which included the collection of surface soil and tank samples on the Murphy Property site, concluded that releases of oil and hazardous materials had occurred at the site which had affected the 271 Salem Street property.

In 1993, Surface Remediation Technologies, Inc. (SRT) of Rowley, MA, on behalf of the property owner, conducted a Preliminary Subsurface Investigation (PSI) at the site. The PSI consisted of advancing soil borings/subsurface soil sample collection; groundwater monitoring well installation and sampling; surface soil sample collection from an area of stained soil; and product sampling from four USTs and two oil bunkers.

Subsurface soil samples collected by SRT exhibited a petroleum odor, and sample headspace screening with a photoionization detector (PID) indicated elevated levels of volatile organic compounds (VOCs), ranging from 20 parts per million (ppm) to 110 ppm. Subsurface soil sample analytical results indicated petroleum products, including No. 2 fuel oil and motor/hydraulic oil, exceeding Massachusetts Department of Environmental Protection (MassDEP) standards. The analytical results of the one surface soil sample indicated the presence of petroleum hydrocarbons (motor/hydraulic oil) and chlorinated VOCs (CVOCs), including tetrachloroethene (PCE), trichloroethene (TCE), and cis-1,2-dichloroethene (cis-1,2-DCE), above the MassDEP S-1 standards.

Groundwater sample analytical results of SRT samples indicated the presence of petroleum products, including No. 2 fuel oil, No. 6 oil, and motor/hydraulic oil, exceeding MassDEP standards; and a variety of petroleum-related products and CVOC solvents, none of which exceeded MassDEP GW-3 standards. In addition, results for the one groundwater sample analyzed for polychlorinated biphenyls (PCBs) indicated the presence of Aroclors 1242 and 1260.

Tank sample analytical results of SRT samples indicated the presence of No. 2 fuel oil, motor/hydraulic oil, petroleum-related VOCs, and CVOCs including PCE, TCE, 1,1,1-trichloroethane (1,1,1-TCA), and cis-1,2-DCE.

Description of Substances Possibly Present, Known or Alleged: Waste oils and petroleum-related products, PCBs, and CVOCs are among the substances on site.

Existing Analytical Data

() Real-Time Monitoring Data:

(X) Sampling Data: *Preliminary Subsurface Investigation and Characterization of Risk, Murphy Property, 263 Salem Street, Woburn, MA 01801, by Subsurface Remediation Technologies, Inc., December 1993.*

REMOVAL PRELIMINARY ASSESSMENT

Existing Analytical Data (Continued)

Phase II Environmental Site Assessment, 271 Salem Street, Woburn, MA, by Nover-Armstrong Associates, Inc., 124 Main Street, Unit 2GG, Carver, MA 02330, August 2004.

Potential Threat

Description of potential hazards to environment and/or population-identify any of the criteria for a Removal Action (from NCP) that may be met by the site under 40 CFR 300.415 [b] [2].

- i. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants.
- ii. Actual or potential contamination of drinking water supplies or sensitive ecosystems.
- iii. Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release.
- iv. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate.
- v. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.
- vi. Threat of fire or explosion.
- vii. The availability of other appropriate federal or state response mechanisms to respond to the release.
- viii. Other situations or factors that may pose threats to public health or welfare or the environment.

Prior Response Activities

☐ PRP ☐ STATE ☐ FEDERAL ☐ OTHER
Brief Description: None

Priority for Site Investigation

☒ High ☐ Medium ☐ Low ☐ None
Comments:

REMOVAL PRELIMINARY ASSESSMENT

Report Generation

Originator:	Paul Callahan	Date:	9 October 2006
Affiliation:	Weston Solutions, Inc. (START)	Telephone:	(978) 552-2129
TDD No.:	01-06-07-0008	Task No.:	0219



**EPA REGION I
REMOVAL SITE INVESTIGATION**

Inspection Information

Site Name: Murphy Property (263 Salem Street) **Address:** 263 Salem Street
Town: Woburn **County:** Middlesex **State:** Massachusetts
Date of Inspection: 25 July 2006 (Reconnaissance) **Time of Inspection:** 0900 Hours
Weather Conditions: Sunny, Calm, Humid, approximately 80 degrees Fahrenheit (°F).
Date of Inspection: 23 August 2006 (Sampling) **Time of Inspection:** 0730 Hours
Weather Conditions: Partly Sunny, Calm, approximately 70°F.

Site Status at Time of Inspection: ☐ **ACTIVE** ☒ **INACTIVE**
Comments:

Agencies/Personnel Performing Inspection

	<u>Names</u>	<u>Program</u>
(X) EPA:	Ted Bzenas (7/25/06 and 8/23/06)	Emergency Planning and Response Branch (EPRB)
	Lori Muller (8/23/06)	EPRB
(X) EPA Contractor:	Paul Callahan (7/25/06 and 8/23/06)	Superfund Technical Assessment and Response Team (START)
	Eric Ackerman (8/23/06)	START
	Ryan Manderbach (8/23/06)	START
	Tim Benton (8/23/06)	START
	Gerald Hornok (8/23/06)	START
	Lindsay Rasel (8/23/06)	START
(X) State:	Kyle MacAfee (7/25/06 and 8/23/06)	Massachusetts Department of Environmental Protection (MassDEP) Bureau of Waste Site Cleanup
	Katherine Cahill (8/23/06)	MassDEP

() Other:

Current Owner Based on Field Interview: Joan Murphy

REMOVAL SITE INVESTIGATION

Physical Site Characteristics

Parameter	Quantities/Extent
<input type="checkbox"/> Cylinders:	
<input checked="" type="checkbox"/> Drums:	Three drums were located on site; two were empty, and one contained oil/product.
<input type="checkbox"/> Lagoons:	
<input checked="" type="checkbox"/> Tanks: <input checked="" type="checkbox"/> Above:	There was one tank truck on site that contained oil/product.
<input checked="" type="checkbox"/> Below:	There were four partially buried and one fully buried underground storage tanks (USTs) on site that contained oil/product. One 75,000-gallon (75K) bunker (45.5 feet by 30 feet) and one 15,000-gallon (15K) bunker (16 feet by 17 feet) were located on site, each containing an aqueous liquid.
<input type="checkbox"/> Asbestos:	
<input type="checkbox"/> Piles:	
<input checked="" type="checkbox"/> Stained Soil:	There was stained soil adjacent to the aboveground storage tanks (ASTs), USTs, and bunkers.
<input type="checkbox"/> Sheens:	
<input type="checkbox"/> Stressed Vegetation:	
<input type="checkbox"/> Landfill:	
<input checked="" type="checkbox"/> Population in Vicinity:	There are numerous commercial facilities and some residential properties in the vicinity.
<input checked="" type="checkbox"/> Wells: <input checked="" type="checkbox"/> Drinking:	START noted two apparent well heads on site. The use of these wellheads is unknown.
<input checked="" type="checkbox"/> Monitoring:	There were multiple monitoring wells located adjacent to and on site.
<input type="checkbox"/> Other:	

Physical Site Observations

The site is bounded to north by Salem Street and commercial properties (including Murphy's Waste Oil Services, Former Whitney Barrel Company, Aberjona Auto Parts); to the west by commercial property (Dondero Property); to the south by commercial property (MIRRA Realty Trust Property at 271 Salem Street); and to the east by the 271 Salem Street access road and additional commercial properties.

The property is approximately 1 acre, and contains an unoccupied, three-story house; a garage; a 75,000-gallon (75K) waste oil bunker; a 15,000-gallon (15K) waste oil bunker; and several USTs and ASTs. There is a circular, unpaved driveway that begins and ends on Salem Street, and which extends around the house and leads to the garage. The property slopes up from Salem Street to the north and west, and includes areas of unmaintained lawn and some heavy brush.

REMOVAL SITE INVESTIGATION

Physical Site Observations (Concluded)

The garage contains several vehicles and miscellaneous equipment; and the southwest portion of the property is used for storage of construction equipment.

Field Sampling and Analysis

	Field Instrumentation				Other
	CGI/O ₂ (%/%)	RAD (uR/hour)	PID (units)	FID (units)	
Background Readings:	0/20.8	10	0	0	
Matrix/Analytical Parameter					
Ambient Air:	0/20.8	10	0	0	
Soil:					
Surface:					
Water:					
Tanks:			250	750	
Drums:			1,600	2,400	
Vats:					
Lagoons:					
Spillage:					
Run Off:					
Piles:					
Sediments:					
Groundwater:					
Other:					

Field Quality Control Procedures

	(X) SOP Followed	() Deviation From SOP
Comments:		

Description of Sampling Conducted

There were 53 surface soil samples collected from 50 sample locations, and 10 tank/drum samples collected from nine sample locations, for Resource Conservation and Recovery Act (RCRA) metals, volatile organic compound (VOC), and polychlorinated biphenyl (PCB) analyses.

At the request of the Task Monitor, there were 50 surface soil split samples and nine tank/drum split samples collected and relinquished to the potentially responsible party (PRP).

Analyses		
Analytical Parameter	Media	Laboratory
<input checked="" type="checkbox"/> VOC	<input type="checkbox"/> AIR	<input checked="" type="checkbox"/> NERL
<input checked="" type="checkbox"/> PCB	<input type="checkbox"/> WATER	<input type="checkbox"/> CLP
<input type="checkbox"/> PESTICIDE	<input checked="" type="checkbox"/> SOIL	<input type="checkbox"/> PRIVATE
<input checked="" type="checkbox"/> METALS	<input checked="" type="checkbox"/> SOURCE	<input type="checkbox"/> SAS
<input type="checkbox"/> CYANIDE	<input type="checkbox"/> SEDIMENT	<input type="checkbox"/> SOW
<input type="checkbox"/> SVOC		<input type="checkbox"/> FIELD
<input type="checkbox"/> TOXICITY		
<input type="checkbox"/> DIOXIN		
<input type="checkbox"/> ASBESTOS		
<input type="checkbox"/> OTHER		
Analytical results: [See Appendix B – Tables and Spreadsheets]		
Receptors		
		<u>Comments</u>
<input type="checkbox"/> Drinking Water <input type="checkbox"/> Private: Municipal:		
<input type="checkbox"/> Groundwater:		
<input checked="" type="checkbox"/> Unrestricted Access:		There are no fences to restrict access to the site.
<input checked="" type="checkbox"/> Population in Proximity:		There are numerous commercial facilities and some residential properties in the vicinity, and the site is used for equipment storage.
<input type="checkbox"/> Sensitive Ecosystem:		
<input type="checkbox"/> Other:		
Additional Procedures for Site Determination		
<input type="checkbox"/> Biological Evaluation		<input type="checkbox"/> ATSDR
To be determined by the Task Monitor.		

REMOVAL SITE INVESTIGATION

Site Determination

Depending on further information, criteria that may be met by the site include 40 CFR 300.415 [b] [2], parts:

- i. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants.
- ii. Actual or potential contamination of drinking water supplies or sensitive ecosystems.
- iii. Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release.
- iv. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate.
- v. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.
- vi. Threat of fire or explosion.
- vii. The availability of other appropriate federal or state response mechanisms to respond to the release.
- viii. Other situations or factors that may pose threats to public health or welfare or the environment.

Report Generation

Originator:	Paul Callahan	Date:	9 October 2006
Affiliation:	Weston Solutions, Inc. (START)	Telephone:	(978) 552-2129
TDD No.:	01-06-07-0008	Task No.:	0219

II. Narrative Chronology

Narrative Chronology

Introduction

The Murphy Property (263 Salem Street) site (the site) is located at 263 Salem Street, Woburn, Middlesex County, Massachusetts. The geographic coordinates of the site are 42° 29' 23.81" north latitude and 71° 07' 50.06" west longitude (see Appendix A – Figures: Figure 1 - Site Location Map). The site is bounded to the north by Salem Street and commercial properties (including Murphy's Waste Oil Services, Former Whitney Barrel Company, and Aberjona Auto Parts); to the west by commercial property (Dondero Property); to the south by commercial property (MIRRA Realty Trust Property at 271 Salem Street); and to the east by the 271 Salem Street access road and additional commercial properties. The site contains an unoccupied, three-story house; a garage; a 75,000-gallon (75K) waste oil bunker; a 15,000-gallon (15K) waste oil bunker; and several underground storage tanks (USTs) and aboveground storage tanks (ASTs). There is a semi-circular, unpaved driveway that begins and ends on Salem Street, and which extends around the house and leads to the garage (see Appendix A – Figures: Figure 2 - Site and Sample Location Map). The property slopes up from Salem Street to the north and west, and includes areas of unmaintained lawn and some heavy brush. The garage contains several vehicles and miscellaneous equipment; and the southwest portion of the property is used for storage of construction equipment.

Site Background

The site was formerly used as an oil and waste oil storage/transfer facility, beginning in the 1920s. All operations and use of the site as a waste oil storage/transfer facility ceased in 1987. Tank contents were reportedly removed during the early 1990s. In 1989, 1990, and 1993, environmental investigations were conducted at the adjacent 271 Salem Street property. Monitoring wells were installed during these investigations, and groundwater, soil, and tank samples were collected. Analytical results from these samples indicated that the soil and groundwater had been impacted by petroleum hydrocarbons and Number (No). 2 fuel/lubricating oils. One of the investigations, which included the collection of surface soil and tank samples on the Murphy Property site, concluded that releases of oil and hazardous materials had occurred at the site which had affected the 271 Salem Street property.

Site Activities

On 25 July 2006, U.S. Environmental Protection Agency (EPA) On-Scene Coordinator (OSC) Ted Bzenas; Weston Solutions, Inc., Superfund Technical Assessment and Response Team (START) member Paul Callahan; and Kyle MacAfee, Massachusetts Department of Environmental Protection (MassDEP) representative, conducted a site reconnaissance as part of a Preliminary Assessment/Site Investigation (PA/SI). The purpose of the reconnaissance was to identify areas of concern and to select potential sample locations. The weather was sunny, calm, humid, and approximately 80 degrees Fahrenheit (°F). All activities were conducted in accordance with the site health and safety plan (HASP). The site HASP has been prepared as a separate document, entitled *Weston Solutions, Inc., Region I START Site Health And Safety Plan (HASP) for the Murphy Property (263 Salem Street) Preliminary Assessment/Site Investigation, Woburn, Massachusetts*. A Ludlum MicroR radiation meter and a Rae Systems MultiRae Plus multigas meter were calibrated at the START office and bump tested on site. Personnel arrived

on site; conducted a tailgate safety meeting; and then EPA, START, and MassDEP personnel proceeded with the site reconnaissance.

Stressed vegetation (rocky/gravelly soil with moss growing on it), which may have been pavement at one time, was observed along the northeastern corner of the site. Proceeding south along the 271 Salem Street access road, two drums were observed in the brush. One of these drums was upright, open, and contained trash; and the other was on its side, with a side bung, closed, and contained an unknown liquid. The group proceeded to the 75K bunker that was reportedly used for waste oil storage. The 75K bunker was approximately 150 feet long by 50 feet wide and was recessed into the ground to an undetermined depth. A steel plate cover and a locked access hatch were noted on the southeastern side of the 75K bunker. Loose, steel piping (approximately 2-inch-diameter) was observed on the roof of the bunker. A closed drum that appeared to be empty was lying on its side on the roof of the bunker. Asphalt/oil staining was noted in the soil adjacent to the 75K bunker. Two flush-mount monitoring wells were observed along the 271 Salem Street access road.

Three USTs (Tank 1, Tank 2, and Tank 3) that were partially recessed into the ground, and a tank truck body (similar to a fuel oil delivery truck), all reportedly used for waste oil storage, were observed in the heavy brush along the southeastern corner of the property. The three tanks were at least partially open to the atmosphere and could be accessed. Tank 1 appeared to contain a small amount of sludge. No readings above background levels were detected on the MultiRae. Tank 2 appeared dry/empty, and no readings above background levels were detected on the MultiRae. Tank 3 contained some liquid/sludge, and readings of approximately 1 unit total volatile organic compounds (VOCs) above background levels was detected. The tank truck appeared to contain some sludge and liquid. No readings above background levels were detected on the MultiRae. The 15K bunker was situated between the tank area and the east side of the garage. There was an open access way to the bunker, which contained some liquid; however, no readings above background levels were detected on the MultiRae. An upright, closed drum, which appeared to be empty, was situated next to the 15K bunker. There were also five pipes (approximately 0.5-inch-diameter) protruding from the ground adjacent to the 15K bunker, the purpose of which was unclear (possibly pipe supports). In addition, there was unconnected steel piping (approximately 2-inch-diameter) lying on the ground.

The garage, with two doors and three rooms, was not accessed. It appeared to contain several vehicles and non-hazardous residential and/or office materials. Another UST (Tank 4), reportedly used for waste oil storage and partially recessed in the ground, was observed behind the southwest corner of the garage. This UST contained some liquid/sludge. No readings above background levels were recorded on the MultiRae at Tank 4. A camper body, propped up on empty drums and steel supports, was also noted. The camper body appeared unstable. Tank 5, a UST reportedly used for gasoline storage and reportedly located in the southeast corner of the property, could not be located. Various pieces of construction equipment were stored in this area.

Tank 6, a UST reportedly used for home heating oil for the house, was located at the northwest corner of the house. Fill and vent pipes protruding from the ground were not accessed due to difficulty opening them. A home heating oil AST is reportedly located inside the residence, but the residence was not accessed and the AST could not be verified.

Two suspected drinking water well heads are located east of the house in the lawn area, and several monitoring wells are located throughout the property. There were no elevated radiation levels detected anywhere on the property; and there were no elevated levels detected on the MultiRae except for the reading of approximately 1 unit VOCs above background at Tank 3. Poison ivy, overgrown vegetation, and steep slopes/uneven terrain were noted in the southeast portion of the property. START noted heavy vehicular traffic along Salem Street, and moderate traffic along the 271 Salem Street access road.

On 23 August 2006, EPA and START collected surface soil and tank/drum samples as part of a Removal Program PA/SI. MassDEP personnel were also present during these activities. Sampling activities called for the collection of up to 37 surface soil samples from pre-determined grid locations; up to 13 surface soil samples from selected grab locations; and up to 10 product samples from drums, USTs, and ASTs. Personnel participating in or observing sampling activities included OSCs Ted Bzenas (EPA) and Lori Muller (EPA); START members Paul Callahan, Eric Ackerman, Ryan Manderbach, Tim Benton, Gerald Hornok, and Lindsay Rasel; and MassDEP personnel Kyle MacAfee and Katherine Cahill. The weather was sunny, calm, humid, and approximately 80°F.

Upon arrival at the site, a tailgate safety meeting was conducted, equipment and supplies were unloaded and prepared, air monitoring instruments [a ThermoElectron TVA 1000 photoionization detector/flame ionization detector (PID/FID) and a Rae Systems MultiRae Plus multigas meter] were calibrated, and personnel reviewed and signed the HASP. Following completion of these activities, appropriate personal protective equipment (PPE) was donned, and sampling activities commenced. Sampling activities were performed in accordance with the site sampling and analysis plan (SAP), which has been prepared as a separate document, entitled *Sampling and Analysis Plan for the Murphy Property (263 Salem Street) Site, Woburn, Massachusetts*.

START personnel established an approximately 33-foot sampling grid over the entire property, resulting in 37 grid sample locations, as specified in the SAP. Following establishment of the sampling grid, one group of START personnel began collecting surface soil samples from the grid locations while another group began collecting tank/drum samples from nine separate locations determined by EPA. Descriptions of surface soil and drum and tank samples collected on site are summarized in Table 1 (see Appendix B – Tables and Spreadsheets - Table 1, Site Sample Descriptions).

Sample DP-01 was collected from the 75K bunker at a depth approximately 3 to 12 inches around a sump area directly below the access hatch in the southeast portion of the bunker. The sample consisted of an aqueous liquid, having an oily sheen on top. The pH of the liquid was approximately 6 to 7 units, and readings of approximately 3.5 units above background levels were detected on the FID. No elevated readings were noted on other air monitoring instruments.

Samples DP-02 and DP-03 (duplicate) were collected from the 15K bunker at a depth of approximately 3 feet. The sample consisted of an aqueous liquid, having a pH of approximately 6 units. No elevated readings were noted on other air monitoring instruments.

At approximately 0940 hours, potentially responsible party (PRP) Joan Murphy arrived on site and requested that EPA provide her with split samples for all samples being collected. After consulting with START, EPA agreed to provide one 4-ounce jar for each sample location (both soil and tank/drum product), preserved on ice, with no field duplicates or other quality assurance/quality control (QA/QC) samples. Any sample locations already collected would be re-sampled for the split sample only. Split samples for any sample locations not yet collected would be collected at the same time as the EPA sample.

Sample DP-04 was collected from Tank 3 at a product depth of approximately 3 inches. This sample was a thin, black, semi-viscous oily liquid. No elevated readings were noted on any of the air monitoring instruments.

Sample DP-05 was collected from Tank 2 at a product depth of approximately 4 inches. This sample was a black, viscous/sludgy, oily liquid. Readings of approximately 3.5 units above background were detected on the FID. No elevated readings were noted on other air monitoring instrumentation.

While START was collecting grid surface soil samples and tank/drum samples, EPA selected 13 additional surface soil sample locations. The sample descriptions for these locations (SS-38 through SS-50) are also described on Table 1. Following completion of the grid location surface soil samples, START personnel began collecting surface soil samples SS-38 through SS-50. Other START personnel continued with tank/drum sample collection.

Sample DP-06 was collected from Tank 1 at a product depth of approximately 6 inches. This sample was a black, viscous/sludgy, oily liquid. Readings of approximately 12 units above background levels were detected on the FID and 1.5 units above background levels were detected on the PID. No elevated readings were noted on other air monitoring instrumentation.

Sample DP-07 was collected from the tank truck at a product depth of approximately 2 inches. This sample was a black, non-viscous, oily liquid. Readings of approximately 50 units above background levels were detected on the FID and PID. No elevated readings were noted on other air monitoring instrumentation.

Sample DP-08 was collected from Tank 4 at a product depth of approximately 2 inches. This sample was a black, semi-viscous, oily liquid. Readings of approximately 30 units above background levels were detected on the FID, and 8 units above background levels were detected on the PID. No elevated readings were noted on other air monitoring instrumentation.

Sample DP-09 was collected from Tank 6 at a product depth of approximately 4 inches. This sample was a dark brown, non-viscous oily liquid, having a turpentine-like odor. Readings of approximately 735 units above background levels were detected on the FID, and 250 units above background levels were detected on the PID. No elevated readings were noted on other air monitoring instrumentation.

Sample DP-10 was collected from a 55-gallon drum. This drum had a side bung and was lying on its side along the 271 Salem Street access road in the northeast portion of the site. The drum contents consisted of a multi-phase liquid. The top layer was a thin, opaque, and semi-viscous liquid. A silvery-black, viscous liquid, which became very sticky as it dried, was located beneath this layer. Initial air monitoring efforts overloaded the PID and extinguished the flame

on the FID. Subsequent air monitoring readings of approximately 2,400 units above background levels were detected on the FID, and 1,600 units above background levels were detected on the PID. No elevated readings were noted on other air monitoring instrumentation.

Upon completion of all soil and tank/drum sample collection activities, samples were fully containerized and packaged for transport, and chain-of-custody documentation was completed. All sample locations were documented using global positioning system (GPS) equipment, and sample locations were photodocumented (see Appendix C – Photodocumentation Log). The chain-of-custody record is included as Appendix D (see Appendix D – Chain-of-Custody Record).

On 24 August 2006, the EPA samples were delivered by START personnel to the EPA Office of Environmental Measurement and Evaluation (OEME), located in North Chelmsford, Massachusetts. The split samples were relinquished by START to OSC Bzenas, who then delivered and relinquished them to PRP Joan Murphy at her residence.

On 29 September 2006, START received the analytical data results from OEME. These data are summarized in Appendix B (see Appendix B – Tables and Spreadsheets: Tables 2 through 7). Analytical results for selected analytical parameters are shown on Figures 3 and 3A (see Appendix A – Figures: Figure 3 - PCB and TCE Sample Results Map; and Figure 3A - Lead Results Map). Complete laboratory data results may be found in the Murphy Property (263 Salem Street) Site File.

Six VOCs, two PCB aroclors, and eight metals were detected above detection limits in the surface soil samples; and 14 VOCs, one PCB aroclor, and two metals were detected above detection limits in the tank/drum samples. A discussion of these results follows.

Six VOCs (with sample number and maximum concentration in parentheses) were detected in surface soil samples and include the following: acetone [246 micrograms per kilogram ($\mu\text{g/kg}$) in SS-26]; 2-butanone (133.3 $\mu\text{g/kg}$ in SS-26); 1,1,1-trichloroethane (341.1 $\mu\text{g/kg}$ in SS-45); 1,2,4-trichlorobenzene (120.8 $\mu\text{g/kg}$ in SS-43); naphthalene (98.6 $\mu\text{g/kg}$ in SS-43); and 1,2,3-trichlorobenzene (153.7 $\mu\text{g/kg}$ in SS-43). VOCs were detected in eight of the surface soil samples. None of the six VOCs detected in surface soil samples exceeded their respective MassDEP Reportable Concentrations for Soil Category 1 (RCS-1). A summary of VOCs detected above detection limits in surface soil samples is provided in Appendix B, Tables and Spreadsheets, Table 2, *Summary of Volatile Organic Compound Results, Surface Soil Samples*.

Two PCB aroclors (1254 and 1260) were detected in surface soil samples. The maximum concentrations of aroclor-1254 [9,800 milligrams per kilogram (mg/kg)] and aroclor-1260 (850 mg/kg) were detected in SS-46. Forty-four of the surface soil samples were found to contain at least one PCB aroclor. Concentrations of at least one PCB aroclor were found to exceed the MassDEP RCS-1 for PCBs (2 mg/kg) in 12 surface soil samples. A summary of PCBs detected above detection limits and MassDEP RCS-1 standards in surface soil samples is provided in Appendix B, Tables and Spreadsheets, Table 3, *Summary of Polychlorinated Biphenyl Results, Surface Soil Samples*.

Eight metals (with sample number and maximum concentration in parentheses) were detected in surface soil samples and include the following: antimony (36 mg/kg in SS-46), barium (6,800 mg/kg in SS-46), cadmium (22 mg/kg in SS-46), chromium (920 mg/kg in SS-46), copper (3,900

mg/kg in SS-46), lead (37,000 mg/kg in SS-46), nickel (91 mg/kg in SS-46), and zinc (16,000 mg/kg in SS-45). Concentrations of metals exceeded MassDEP RCS-1 standards in 32 surface soil samples. A summary of metals detected in surface soil samples and those exceeding MassDEP RCS-1 standards is provided in Appendix B, Tables and Spreadsheets, Table 4, *Summary of Metals Results, Surface Soil Samples*.

Fourteen VOCs (with sample number and maximum concentration in parentheses) were detected in drum/tank samples and include the following: 1,1,2-trichloro-1,2,2-trifluoroethane (2 µg/kg in DP-02 and DP-03); benzene (17,455 µg/kg in DP-10); toluene (63,896 µg/kg in DP-10); m/p-xylene (212,337 µg/kg in DP-09); ortho-xylene (136,957 µg/kg in DP-09); isopropylbenzene (178,377 µg/kg in DP-09); 1,2,4-trimethylbenzene (668,587 µg/kg in DP-09); naphthalene (472,647 µg/kg in DP-09); styrene (93,987 µg/kg in DP-10); tetrachloroethylene (2 µg/kg in DP-02 and DP-03); trichloroethylene (100 µg/kg in DP-03); cis-1,2-dichloroethylene (49 µg/kg in DP-03); 1,1,1-trichloroethane (17 µg/kg in DP-03); and vinyl chloride (2 µg/kg in DP-02 and DP-03). VOCs were detected in five of the drum/tank samples. A summary of VOCs detected above detection limits in drum/tank samples is provided in Appendix B, Tables and Spreadsheets, Table 5, *Summary of Volatile Organic Compound Results, Drum/Tank Product Samples*.

One PCB aroclor (1254) was detected in two of the drum/tank samples. Concentrations of aroclor-1254 were detected in DP-05 and DP-06 at 680 mg/kg and 820 mg/kg, respectively. A summary of PCBs detected in drum/tank samples is provided in Appendix B, Tables and Spreadsheets, Table 6, *Summary of Polychlorinated Biphenyl Results, Drum/Tank Product Samples*.

Two metals (with sample number and maximum concentration in parentheses) were detected in drum/tank samples and include the following: barium (350 mg/kg in DP-08) and lead (540 mg/kg in DP-05). Lead was detected in seven of the drum/tank samples, and barium was detected in only one. A summary of PCBs detected in drum/tank samples is provided in Appendix B, Tables and Spreadsheets, Table 7, *Summary of Metals Results, Drum/Tank Product Samples*.

III. Appendices