

**Draft Phase I Environmental Site Assessment  
Fernald Developmental Center  
200 Trapelo Road  
Waltham, Massachusetts**

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## **ACRONYMS/ABBREVIATIONS**

<b>Acronym/ Abbreviation</b>	<b>Definition</b>
ACEC	Area of Critical Environmental Concern
APN	Assessor Parcel Number
ASTM	American Society for Testing and Materials
AST	Aboveground Storage Tank
AUL	Activity and Use Limitation
BTEX	Benzene, toluene, ethylbenzene, and xylenes
bgs	Below ground surface
BWSC	Bureau of Waste Site Cleanup
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CESQG	Conditionally Exempt Small Quantity Generator
CORRACTs	Corrective Actions
CSA	Comprehensive Site Assessment
DCAM	Massachusetts Division of Capital Asset Management
DEQE	Department of Environmental Quality
DMR	Department of Mental Retardation
EDR	Environmental Data Resources, Inc.
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentrations
EPH	Extractable Petroleum Hydrocarbons
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
FDC	Fernald Developmental Center
FEMA	U.S. Federal Emergency Management Agency
FINDS	Facility Index System
FUDS	Formerly Used Defense Sites
HSWA	Hazardous and Solid Waste Amendments
ICF	Intermediate Care Facility
INST	Institutional Control Site
IRA	Immediate Response Action
LAST	Leaking Aboveground Storage Tank
LNAPL	Light Non-Aqueous Phase Liquid
LQG	Large Quantity Generator
LSP	Licensed Site Professional



**Acronym/  
Abbreviation****Definition**

LUST	Leaking Underground Storage Tank
MassDEP	Massachusetts Department of Environmental Protection
MassGIS	Massachusetts Geographic Information System
MCP	Massachusetts Contingency Plan
MCRD	Middlesex County Registry of Deeds
MLTS	Materials Licensing Tracking System
MSL	Mean Sea Level
MTBE	Methyl tert-butyl ether
MWRA	Massachusetts Water Resources Authority
NAPL	Non-aqueous Phase Liquid
NERO	Northeast Regional Office
NFRAP	No Further Remedial Action Planned
NOR	Notice of Responsibility
NPL	National Priority List
NRS	Numerical Ranking System
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated biphenyl
PID	Photoionization detector
ppm	Parts per million
ppmv	Parts per million by volume
PRC	Property Record Card
RAM	Release Abatement Measure
RAO	Response Action Outcome
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RCRA-NonGen	RCRA Non-Generators
REC	Recognized Environmental Condition
RELEASE	Records of Emergency Release Reports
RNF	Release Notification Form
RTN	Release Tracking Number
SANDs	Sites Awaiting NPL Decision
SQG	Small Quantity Generator
SHWS	State Hazardous Waste Sites
SRM	Substantial Release Migration
SPH	Separate Phase Hydrocarbons
SWF/LF	Solid Waste Facilities/Landfill Site
SVOC	Semivolatile Organic Compound
TOV	Total Organic Vapors

**ENVIRONMENTAL ASSESSMENT REPORT - PRIVILEGED DOCUMENT**

**Acronym/  
Abbreviation**

**Definition**

TPH	Total Petroleum Hydrocarbons
TSDF	Transportation, Storage, and Disposal Facility
UCL	Upper Concentration Limit
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound
mg/L	Milligram per liter
mg/kg	Milligrams per kilogram
mg/g	Milligrams per gram
µg/L	Micrograms per liter
µg/kg	Micrograms per kilogram
µg/g	Micrograms per gram

## 1.0 EXECUTIVE SUMMARY

TechLaw, Inc. (TechLaw) has performed a Phase I Environmental Site Assessment (ESA) in general accordance with the scope of work and limitations set forth by the Massachusetts Division of Capital Asset Management (DCAM) for the Fernald Developmental Center located at 200 Trapelo Road, Waltham, Massachusetts (the "Property"). On June 1, 2009, TechLaw received the Notice To Proceed authorization for this ESA (dated May 20, 2009) from DCAM for this ESA.

The Phase I ESA is designed to provide DCAM with an assessment concerning environmental conditions (limited to those issues identified in the report) as they exist at the property. This assessment was conducted utilizing generally accepted ESA industry standards in accordance with *ASTM Practices E1527-05 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM Practice E1527-05). The purpose of this ESA is to identify "Recognized Environmental Conditions" (RECs) in connection with the Property.

The scope of work specified by DCAM for the site assessment included: 1) interviews with people knowledgeable about the Property regarding current and former operations and uses; 2) review of records reasonably available for review from federal, state, and local sources; and 3) visual observations of site-specific and surrounding features and conditions. TechLaw was not tasked with inspection of the interior of on-site buildings.

The Property is currently developed as a 195-acre residential campus for developmentally delayed patients. The "Massachusetts School for Feeble Minded Children" was established in 1848 in South Boston, and moved to its current location in Waltham between 1888 and 1889. In 1925, the school was renamed the Walter E. Fernald State School and later was renamed the Fernald Developmental Center (FDC). The Property is improved with approximately 71 buildings designed for residential and program support and for facility infrastructure. The buildings were constructed between the mid-1800s and the early 1990s.

The Property is situated on the eastern side of Waltham, Massachusetts. The Property is bound to the northeast by Trapelo Road, an elementary school, residences, and a vacant former state mental institution building; to the southeast by residences and beyond Waverley Oaks Road by office buildings; to the southwest by a Girl Scout camp and a state-owned parcel operated by the University of Massachusetts (UMASS) Amherst Agricultural School; and to the northwest by Bentley College, a city-owned park, the F.C. Murphy Federal Records Center, and vacant land. Based upon topographic map interpretation and site observations, general groundwater flow in the region is inferred to the south toward the Charles River.

TechLaw reviewed a database report from Environmental Data Resources, Inc. (EDR) for the Property and the surrounding area. Based on review of the database report and available information, two adjacent sites were identified as potential concerns to the Property. TechLaw identified one Resource Conservation and Recovery Act (RCRA) generator on the Property. The Property is also listed on the underground storage tank (UST) database and is listed on the Massachusetts Spills (MA Spills) database. Ten past releases of petroleum on the Property have resulted in "disposal site" listings, and nine of these listings were present on the Massachusetts Reportable Release (MA RELEASE), state hazardous waste site (SHWS), and leaking underground

storage tank (LUST) databases. Although one Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), and several MA RELEASE, SHWS, LUST, leaking aboveground storage tank (LAST) sites are located within one-quarter mile of the Property, all but two were identified as either cross or downgradient of the Property or with a regulatory status of Response Action Outcome (RAO) and, therefore, not considered to be RECs.

### **Conclusions**

TechLaw has performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E1527-05 for the Fernald Developmental Center located at 200 Trapelo Road in Waltham, Massachusetts. Any exceptions to or deletions from this practice are described in Section 6.1 of this report. This assessment has revealed no evidence of RECs in connection with the Property, except for the following:

- Soil contaminated with No. 6 fuel oil is present in an AUL area under and south of the Power Plant.
- A 65-year old oil pipeline easement exists on the Property whose condition is unknown.
- Thermal pipe insulation present on pipes in outdoor locations was observed to be in fair to poor condition; asbestos may be present in the pipes and able to be dispersed by wind and water. Asbestos siding is also noted present on the former Volunteer Center (282 Trapelo Road) and the former Day Care (180 Trapelo Road).
- A 39-year-old, 750-gallon diesel UST located at the Shriver Center is not equipped with corrosion protection and could release diesel fuel into the ground.
- No. 2 fuel oil ASTs located in four vacant residential buildings are at least 30 years old, and the buildings are in poor condition.
- An oil plume appears to be approaching the Property from an upgradient adjacent parcel on the northwest side of the Property.
- The wetland on the southern portion of the Property may have been impacted by heavy metals due to an agricultural experiment on the adjacent parcel.

## **2.0 INTRODUCTION**

### **2.1 Purpose**

The purpose of this Phase I ESA is to identify RECs in connection with the Property. An REC is defined by ASTM E1527-05 as “the presence or likely presence of hazardous substances or petroleum products on a property under conditions that indicate an existing release, past release, or a material threat of a release of hazardous or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.”

### **2.2 Scope-of-Services**

The scope of work for this ESA included interviewing people knowledgeable about the Property with respect to current and former operations; reviewing records/files that were reasonably available for review from federal, state, and local sources; and conducting a site reconnaissance of the Property. This information is summarized in this report. Collected information was analyzed to determine the existence of RECs on or near the Property, as defined in ASTM Practice E1527-05. Within the limits of the scope of work and prior to the finalization of this report, every effort was made to evaluate potential hazardous environmental conditions that were identified during the site assessment.

#### **2.2.1 Site Reconnaissance**

TechLaw completed the site reconnaissance over three days between June 30 and July 13, 2009. Findings of the site reconnaissance are recorded in Section 6 of this report. Site photographs are presented in Appendix A of this report.

#### **2.2.2 Review of Records and Database Printout**

TechLaw reviewed readily available city, county, state, and federal government agency records to determine whether the site and/or adjacent properties are engaged in the storage, generation, transportation, or disposal of hazardous materials. TechLaw also reviewed records to determine the presence of on-site or nearby landfills, solid waste disposal sites, registered storage tanks, leaking registered storage tanks, and spill incident reports. Copies of U.S. Environmental Protection Agency (EPA) and state records consist of a database report which is appended to this report.

Standard historical information sources were reviewed by TechLaw to obtain site usage and included historical aerial photographs, historical U.S. Geological Survey (USGS) topographic maps, Sanborn Fire Insurance Maps, and a City Directory Abstract prepared for the Property. These resources were compiled by and obtained from Environmental Data Resources, Inc. (EDR) and are included in Appendix B.

TechLaw reviewed topographic, orthographic, geologic, hydrologic, and regulated area maps for information regarding the physical setting of the subject property. Copies of these maps are provided as Figures 1, 2, 4, 5, 6, 7, 8 and 9.

### **2.3 Significant Assumptions**

This assessment was conducted in accordance with generally accepted industry practices and procedures within the scope of work authorized at the time and place of this study. TechLaw's observations are limited to those areas to which it had access on the subject property.

The site inspection included viewing accessible areas of the Subject Property on foot wherever possible. During the completion of this Phase I ESA, TechLaw followed the guidelines presented in ASTM E1527-05, with the exception of evaluating the building interiors. The work scope for this ESA included assessment of building exteriors and readily accessible areas on the Subject Property. TechLaw notes that other contractors have been tasked with interior assessments of Property buildings. TechLaw was not provided with access into the majority of Property buildings.

### **2.4 User Reliance**

This report may be distributed and relied upon by DCAM, its successors and assigns. Reliance on the information and conclusions in this report by any other person or entity is not authorized without the written consent of TechLaw, Inc.

### **3.0 SITE DESCRIPTION**

#### **3.1 Location and Legal Description**

The principal address for the Property is 200 Trapelo Road, Middlesex County, Waltham, Massachusetts. According to the Waltham Assessors Office, the Property occupies two parcels with a combined area of 195.06 acres of land and improvements. The two contiguous parcels are located on the east side of the City of Waltham. The larger 163.05-acre parcel is identified as Assessor Parcel No. (APN) R045 001 0001, and is listed in the Waltham Assessors records as 190 Trapelo Road. The smaller 32.01-acre parcel is identified as APN R036 008 0001, and is listed in the Waltham Assessors records as 338 Trapelo Road. The Commonwealth of Massachusetts is listed as the owner of the two parcels. Other street addresses for the Property include 180 Trapelo Road (a former residence that was most recently occupied as a staff daycare center) and 282 Trapelo Road (a former residence that was most recently occupied as a Volunteer Center). The Site Locus Map is included as Figure 1 and a Site Plan is included as Figure 2.

The Property features frontage on the south side of Trapelo Road and the northwest side of Waverley Oaks Road, and is accessed from entrances on each of these roads. The Property abuts parcels that are located north of Beaver Street and east of Forest Street.

A legal description was not provided by DCAM for the Property and was not obtained as part of this ESA.

#### **3.2 Site General Characteristics**

The Property occupies two irregularly-shaped contiguous parcels in a hilly area of Waltham north of the Charles River. Elevations vary widely across the Property, and range from a hilltop at an elevation of 240 feet above mean sea level (MSL) near the eastern property line to a wetland area at 50 feet above MSL near the southern corner of the Property near Waverley Oaks Road. Woodlands and broad spreading lawns on the Property divide functional areas and buildings.

The Property is surrounded by a public school and a parcel (formerly occupied as a state hospital) to the north; residential neighborhoods to the northeast and southeast; a commercial area occupied by commercial buildings to the south-southeast; a Girl Scout Camp and agricultural land (including a wetland) occupied by the University of Massachusetts Amherst Agricultural School (UMASS) to the southwest; and college buildings, a city park, and the Regional Archives of the Federal Records Center to the northwest.

### 3.3 Current Use of the Property

The Property is currently used primarily as a residential campus by the Massachusetts Department of Mental Retardation (DMR) and operates as the Fernald Developmental Center (FDC). The Eunice Kennedy Shriver Center (Shriver Center) is also located on the FDC campus and is operated by the University of Massachusetts Medical School. (For the purposes of this ESA, the Shriver Center is included in the Property boundaries.) Other state offices that occupy portions of the FDC facility including the State Police, Tufts Dental Facility for the Handicapped, and the Department of Weights and Measures.

### 3.4 Description of Structures, Roads, and Other Site Improvements

The Property is improved with approximately 71 major structures along with smaller sheds, garages, and temporary structures. Concrete and asphalt paved streets, sidewalks, driveways, and parking areas are present throughout the Property. Some unpaved roads are also present in the southern portion of the Property. Older structures in the campus core tend to be of brick construction and are typically situated over basements; several of these buildings have been condemned due to their poor condition and are surrounded by locked chain-link fences. Newer buildings on the property typically consist of slab-on-grade construction with brick, masonry, or walls covered with manufactured siding.

All of the FDC's buildings are provided with potable water and sewer service by the Massachusetts Water Resources Authority (MWRA); TechLaw notes that the Property's three former residential structures adjacent to Trapelo Road have water and sewer connections to the City of Waltham which also obtains water and sewer services from the MWRA. No clarifiers or other wastewater treatment systems are present on the Property.

The FDC operates a steam plant which provides heat to a majority of the campus buildings through a system of steam and hot water pipes. Steam pipes are conveyed through an underground tunnel system across the campus and hot water pipes are also buried underground. Remaining buildings that are not connected to the steam heat system are heated using oil, propane, or natural gas.

### 3.5 Current Uses of Adjoining Properties

TechLaw observed the following land uses on properties adjacent to the Property:

**Northeast:** Areas immediately adjacent to the northeast of the Property include the following: the Phineas Lawrence Elementary School (258 Trapelo Road), Trapelo Road, and beyond Trapelo Road by undeveloped city-owned land north of Trapelo Road (APN R036 001 0002C); city-owned land occupied by a vacant "dormitory" (285 Trapelo Road, formerly part of the Metropolitan State Hospital); the Metropolitan State Hospital (475 Trapelo Road), and single family residences along Trapelo Road.

**Southeast:** Areas immediately adjacent to the southeast of the Property include the following: residences along Shirley Road, Shawmut Road, TipTop Terrace, Phillips Circle,



Bishop Terrace, and Waverly Oaks Road; Waverley Oaks Road; commercial buildings beyond Waverley Oaks Road occupied by a variety of offices and businesses (355, 319, 307, and 271 Waverley Oaks Road).

**Southwest:** Areas immediately adjacent to the southwest of the Property include the following: agricultural land (including a wetland) owned by the State of Massachusetts and operated by the University of Massachusetts Amherst (225-227 Beaver Street) and the Massachusetts Girl Scout Council (265 Beaver Street).

**Northwest:** Areas immediately adjacent to the northwest of the Property include the following: an undeveloped city-owned parcel (APN R035 007 0016); Bentley College dormitories (371 Forest Street); Waltham City Park and athletic fields (424 Trapelo Road); the F.C. Murphy Federal Records Center (380 Trapelo Road; and a single family residence (385 Trapelo Road).

## **4.0 USER PROVIDED INFORMATION**

### **4.1 Title Records**

Title records for the Property parcels were not provided by DCAM and were not obtained as part of scope of this ESA. A title search was not required for this ESA.

### **4.2 Property Owner and Occupant Information**

According to the Waltham Assessors information, the Commonwealth of Massachusetts is the current owner of the Property. The Commonwealth of Massachusetts has operated a facility for the benefit of developmentally delayed citizens at the Property since approximately 1890.

### **4.3 Reason for Performing the Phase I**

This Phase I ESA was requested by DCAM as part of the closure of the FDC facility and identify any RECs in connection with the Property.

## **5.0 RECORDS REVIEW**

### **5.1 Standard Environmental Record Sources**

Information from standard federal and state environmental record sources was provided for this ESA by EDR. Data from governmental agency lists are updated and integrated into EDR's database, which is updated as these data are released. This integrated database also contains postal service data in order to enhance address matching. The available geographic information provides assistance in identifying risk. The accuracy of the mapped locations is approximately +/-300 feet.

In some cases, location information supplied by the regulatory agencies is insufficient to allow database companies to map facility locations. These facilities are listed as "orphan sites" (i.e., unmappable sites) in the EDR report. A review of the Orphan Summary of unmappable facilities indicated that two of these facilities are within the ASTM minimum search distance from the Property. These facilities are discussed under the appropriate database heading below.

Regulatory information was reviewed from the following database sources regarding possible RECs within the ASTM minimum search distance from the Property. Specific facilities are discussed below if determined likely that a potential REC has resulted at the Property from the listed facilities. Please refer to Appendix C-1 for a complete listing.

#### **5.1.1 Federal NPL**

The National Priorities List (NPL) is the EPA database of uncontrolled or abandoned hazardous waste sites identified for priority remedial actions under the Superfund Program.

The Property is not listed as a NPL or Delisted NPL facility. No NPL or Delisted NPL sites are located within one mile of the Property.

#### **5.1.2 Federal Resource Conservation and Recovery Act (RCRA) CORRACTS Facilities List**

The EPA Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Treatment, Storage, and Disposal (TSD) database is EPA's compilation of reporting facilities that treat, store, or dispose of hazardous waste. The CORRACTS database is the EPA's list of TSD facilities subject to corrective action under RCRA.

The Property is not listed as a RCRA CORRACTS TSD facility. No RCRA CORRACTS TSD facilities are listed within one mile of the Property.

### 5.1.3 Federal Resource Conservation and Recovery Act (RCRA) Non-CORRACTS TSD Facilities List

The RCRA TSD database is a compilation by the EPA of reporting facilities that treat, store, or dispose of hazardous waste.

The Property is not listed as a RCRA-TSD facility. No RCRA TSD sites are listed within one-half mile of the Property.

### 5.1.4 Federal CERCLIS List

The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list is a compilation of sites that the EPA has investigated or is currently investigating for a release or threatened release of hazardous substances.

The Property is not listed as a CERCLIS facility. One CERCLIS site is listed within one-half mile of the Property:

- ***Duffy Bros Construction Inc., 411 Waverley Oaks Rd. (MAD980916316, EDR Map ID C16)*** is mapped approximately 0.088 mile from the Property and is actually located on the southeast side of Waverley Oaks Road. CERCLIS milestones include Site Discovery (1984), a Preliminary Assessment (1987), Site Inspection (1991), and Site Reassessment (2001); the CERCLIS site status is listed as "low priority for further assessment."

TechLaw obtained additional information for this CERCLIS site from the EPA website; the EPA Site Awaiting NPL Decision (SAND) summary is included in Exhibit C-2 of this report. Prior to Duffy Brothers purchase of the 27-acre site in 1973, the Pierce Brothers Oil Company (Pierce Brothers) operated greenhouses at the site which were heated with coal prior to 1920. After 1920, Pierce Brothers heated the greenhouses with waste oil obtained from various off-site sources. The waste oil was stored in aboveground storage tanks (ASTs), underground storage tanks (USTs), and a lagoon on the site. Waste oil storage reportedly ceased on the site after 1973. Extensive sampling revealed the presence of petroleum-related compounds, chlorinated volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and metals in soil, sediment, groundwater and surface water on the site.

The site has been redeveloped with commercial buildings and paved parking areas, and is being remediated under the Massachusetts Contingency Plan (MCP) under Release Tracking Number (RTN) 3-0000454 and is discussed further in section 5.1.8 [as a State Hazardous Waste Site (SHWS)]. Currently, Separate Phase Hydrocarbons (SPH) are collected from five recovery wells and a trench on site for off-site disposal. TechLaw could not confirm the exact boundaries of this CERCLIS site; however, the MCP "disposal site" boundary is shown on a figure included with the supplemental information for RTN 3-0000454. The western edge of the "disposal site" begins on the southeast side of Waverley Oaks Road and the majority of the "disposal site" is located between Waverley Oaks Road and a brook and wetland area further to the east. The

“disposal site” boundary comes within approximately 100 feet of the Subject Property frontage on Waverley Oaks Road. The majority of the remaining contamination at the Duffy Brothers site is located on the southeastern portion of that site which is closest to Beaver Brook. Based on topographic elevations and inferred groundwater flow direction from the Property to the south or south-southeast, contamination from the Duffy Brothers site is not likely to have an adverse impact on the Subject Property.

#### **5.1.5 Federal CERCLIS NFRAP Sites List**

The CERCLIS No Further Remedial Action Planned (NFRAP) List is a compilation of sites that the EPA has investigated and has determined that, under the CERCLA framework, the facility does not pose a threat to human health or the environment.

The Property is not listed as a CERCLIS-NFRAP facility. No CERCLIS-NFRAP sites are listed within one-half mile of the Property.

#### **5.1.6 Federal RCRA Generator List**

The RCRA program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Generators database is a compilation by the EPA of reporting facilities that generate hazardous waste.

The Property is listed as a RCRA facility:

- ***Eunice Kennedy Shriver Center, 200 Trapelo Road (MAD073798720, EDR Map ID A7)*** - The Eunice Kennedy Shriver Center (Shriver Center) is located at the Trapelo Road entrance to the FDC and, up until 2001, was part of the FDC campus. For the purposes of this ESA, the Shriver Center is considered part of the FDC campus. The Shriver Center currently operates as a research and training facility under the University of Massachusetts Medical School and is listed as a RCRA Small Quantity Generator (SQG). Three waste codes are specified for this facility in the EDR Report: ignitable wastes (EPA Waste Code D001), corrosive wastes (D002), and chromium-bearing wastes (D007). The facility was cited with nine RCRA violations in 1994, and the facility came into compliance for all violations in 1996. The RCRA violations appear to be administrative in nature. TechLaw does not consider this on-site RCRA facility to have adversely impacted the Subject Property.

No RCRA facilities were identified on adjacent properties.

#### **5.1.7 Federal Emergency Response Notification System (ERNS)**

The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil or hazardous substances. No ERNS sites were listed on the Property.

#### **5.1.8 State-Listed Disposal Sites (CERCLIS equivalent, LUST, and LAST)**

The Massachusetts Department of Environmental Protection (MassDEP) maintains a listing of sites where oil and/or hazardous materials were reported to be released (MA RELEASE). The EDR report also identifies databases which are a subset of the MA RELEASE database which include sites where the source is identified as a leaking

underground storage tank (LUST), leaking aboveground storage tank (LAST), or fall in the category of sites considered to be actually or potentially contaminated by hazardous wastes and/or oil and that present a possible threat to human health and the environment [i.e., State Hazardous Waste Site (SHWS)]. SHWS are considered CERCLIS-equivalent sites.

Releases of oil and hazardous materials are regulated under the MCP. The MCP specifies notification, assessment, and response actions for "disposal sites" within the Commonwealth. Upon notification to MassDEP, a reportable release is assigned a Release Tracking Number (RTN) and is tracked by MassDEP until the site achieves a condition of "no significant risk" with the goal that a "permanent solution" [i.e., either a Class A or Class B Response Action Outcome (RAO)] is achieved at all sites. If a "temporary solution" (i.e., a Class C RAO) is achieved at a site, MassDEP requires the responsible party to re-evaluate the disposal site every five years to determine whether a "permanent solution" may be achieved.

In addition, the Commonwealth of Massachusetts operates a privatized cleanup program, and private sector Licensed Site Professionals (LSPs) are responsible to conduct notification, assessment, and response activities in accordance with the MCP. Most SHWS fall in the category of "Tier II" sites which generally tend to be less contaminated sites that do not require day-to-day oversight by MassDEP personnel. Tier I sites meet specific Tier I inclusionary criteria and have Numerical Ranking System (NRS) scores greater than 350. Tier I sites tend to have elevated levels of contamination and/or greater potential for human exposure. Under the privatized cleanup program, MassDEP reserves the right to audit sites after an RAO opinion has been rendered by an LSP. Approximately 20% of sites are audited as part of MassDEP's regulatory oversight. Based on audit findings, MassDEP has the authority to reverse the LSP decision and "re-open" a site which had been deemed by the LSP to have achieved RAO status.

TechLaw notes that a single RTN may be listed under multiple databases in the EDR Report. To avoid unnecessary duplication, all sites regulated under the MCP that are listed in the MA RELEASE, LUST, LAST, and/or SHWS databases are described in the category of State-Listed Disposal Sites.

TechLaw notes that EDR considers sites with multiple RTN listings under a single Site Name to be *one* site. For example, the EDR Report may identify 51 SHWS within one mile of the Subject Property, but there actually may be 61 RTNs associated with these listings. The analysis of state sites which follows, where convenient, segregates listings by RTN unless an RTN is linked (after the fact) by MassDEP. Four state databases were evaluated as part of this ESA. The sites selected for discussion in this ESA were screened, based on the following criteria:

**MA RELEASE:** Six of the 66 MA RELEASE sites mapped within a one-half mile radius of the Property were identified on the Subject Property. Of the 60 remaining off-site MA RELEASE sites, 18 are located less than 0.25 mile from the Subject Property and have potential to impact the Subject Property. Six of these 18 MA RELEASE sites are not considered an environmental concern to the Subject Property based on their distance, hydraulically downgradient location, location beyond an intervening stream, and/or "RAO" compliance status; these sites include *Clematis*

*Corporation* (117 Beaver Street); *No Location Aid* (110 Beaver Street); *No Location Aid* (10 Clematis Avenue); *George More Facility Fmr* (110 Beaver Street); *Light Metal Platers* (70-74 Clematis Avenue); and *Industrial Property* (70-74 Clematis Avenue). The remaining 12 MA RELEASE sites are discussed below.

**SHWS:** Three of the 51 SHWS within one mile of the Property were identified on the Subject Property. Of the remaining 48 mapped SHWS listings, 31 SHWS are mapped more than 0.25 miles from the Subject Property boundaries and deemed not likely to have an adverse environmental impact on the Property based on their compliance status, distance, and/or downgradient location. Five of the 17 remaining SHWS mapped within a 0.25-mile radius of the Property are located hydraulically downgradient of the Subject Property and, in conjunction with their compliance status, are not considered an environmental concern to the Subject Property: *Clematis Corporation* (117 Beaver Street); *No Location Aid* (110 Beaver Street); *George More Facility Fmr* (110 Beaver Street); *Light Metal Platers* (70-74 Clematis Avenue); and *Industrial Property* (70-74 Clematis Avenue). The remaining 12 mapped SHWS located within 0.25-miles of the Subject Property are discussed below.

**LUST:** Five of the 13 mapped LUST facilities within 0.5 mile of the Property were identified on the Subject Property. Of the remaining eight mapped LUST sites, four are located greater than 0.25 mile from the Property and deemed not likely to have an adverse environmental impact on the Property based upon their status, distance, or downgradient locations. The four remaining mapped LUST sites which are in closer proximity to the Property are discussed below.

**LAST:** None of the three mapped LAST facilities within a one-half mile radius of the Property were identified on the Subject Property. Two of the three mapped LAST sites are located on Clematis Avenue which is located beyond a brook in a downgradient location and hydraulically separated from the Subject Property; therefore, any contamination present at these two LAST sites would not be likely to impact the Subject Property. The remaining LAST site is discussed below.

#### **5.1.8.1 State-Listed Disposal Sites on the Subject Property**

One RTN listing for the Property [RTN 3-0021380, Thom Building, Fernald Cener, 200 Trapello Rd (*sic*)] did not appear in the EDR report. The remaining nine RTN listings for the Property appear on the MA RELEASE, SHWS, LUST, and/or LAST databases and include:

##### **RTN 3-0011878, Rear Gate Off Waverly Oaks Rd, 200 Trapelo Rd (EDR Map ID A2)**

This site is listed in the MA RELEASE and SHWS databases, and on the MassDEP website with a status of Class A-1 RAO. A release of approximately 30 gallons of No. 6 fuel oil occurred in 1994 while filling a UST at the Power Plant. Oil impacted a paved area and the adjacent stream on the Property and, after response actions were completed, a Class A-1 RAO was achieved. This release is discussed in further detail in section 5.2.2 of this report.

**RTN 3-0015121, Not reported, 200 Trapelo Rd (EDR Map ID A3)**

This site is listed in the MA RELEASE and SHWS databases, and on the MassDEP website with a status of Class A-2 RAO. Approximately 35 to 40 gallons of gasoline were released in 1997 on the Property after a driver backed up into a light stanchion and inadvertently punctured the van's gasoline tank. The driver stopped at two additional locations after initially damaging the vehicle's fuel tank before the release was discovered. Response actions were completed and a Class A-2 RAO was achieved. This release is discussed in further detail in section 5.2.7 of this report.

**RTN 3-0010367, Not reported, 200 Trapelo Rd (EDR Map ID A3)**

This site is listed in the MA RELEASE and SHWS databases, and on the MassDEP website with a status of Class C RAO. Approximately 320 gallons of No. 6 fuel oil were released in 1993 at the Power Plant on the Subject Property after oil delivered to the UST was heated and expanded, thereby overflowing the UST. Some of the oil flowed into the adjacent stream. Response actions were completed and a Class C RAO was achieved; an activity and use limitation (AUL) was implemented as part of the RAO. This release is discussed in further detail in section 5.2.1 of this report.

**RTN 3-0015442, Powerplant, 200 Trapelo Rd (EDR Map ID A5)**

This site is listed in the MA RELEASE and SHWS databases, and on the MassDEP website with a status of Class A-2 RAO. A release of approximately 100 gallons of No. 6 fuel oil occurred while filling a UST at the Power Plant. Oil impacted a paved area and the adjacent stream on the Subject Property and, after response actions were completed, a Class A-2 RAO was achieved. This release is discussed in further detail in section 5.2.5 of this report.

**RTN 3-0021892, Malone Park Bldg. No. 21, 200 Trapelo Rd. (EDR Map ID A1)**

This site is listed in the MA RELEASE and LUST databases, and on the MassDEP website with a status of Class A-2 RAO. The EDR report indicates that a concentration of up to 200 parts per million of No. 2 fuel oil was reported from a UST near a residential building on the FDC campus in June 2002. MassDEP was notified of the heating oil release as a result of UST closure. This release is discussed in further detail in section 5.2.8 of this report.

**RTN 3-0013467, Not reported, 200 Trapelo Rd. (EDR Map ID A3)**

This site is listed in the MA RELEASE and LUST databases, and on the MassDEP website with a status of Class A-3 RAO. An unknown amount of No. 6 fuel oil was released in the vicinity of a concrete wall near the Power Plant on the Subject Property. The source of the oil was identified as the on-site USTs. Response actions were completed and a Class A-3 RAO was achieved which involved implementation of an AUL. This release also appears as a MA RELEASE site in the EDR report, and is discussed in further detail in section 5.2.3 of this report.



**RTN 3-0021893, Malone Park Bldg. No. 23, 200 Trapelo Rd. (EDR Map ID A4)**

This site is listed in the MA RELEASE and LUST databases, on the MassDEP website with a status of Class A-2 RAO. The EDR report indicates that a concentration of up to 200 parts per million of No. 2 fuel oil was reported from a UST near a residential building on the FDC campus in June 2002; the concentration units provided in the EDR report does not identify the environmental matrix (water or soil) that was reported to have been impacted.) MassDEP was notified of the heating oil release as a result of UST closure. This release is discussed in further detail in section 5.2.9 of this report.

**RTN 3-0015149, Powerplant, 200 Trapelo Rd. (EDR Map ID A5)**

This site is listed in the MA RELEASE and LUST databases, and on the MassDEP website with a status of Class B-1 RAO. The EDR report indicates that 250 parts per million by volume (ppmv) of gasoline was encountered in headspace during the closure of a 1,000 gallon gasoline UST at the Power Plant in 1997. An “assessment only” IRA was conducted, and a Class B-1 RAO was achieved at the site. This release is discussed in further detail in section 5.2.4 of this report.

**RTN 3-0010725, Fernald State School, 200 Trapelo Rd. (EDR Map ID A8)**

This site is listed in the MA RELEASE and LUST databases, and on the MassDEP website with a status of Class A-2 RAO. A release of gasoline-related compounds from gasoline USTs at the Farm and Grounds Department impacted soil and water. After response actions were completed, a Class A-2 RAO was achieved. This release is discussed in further detail in section 5.2.6 of this report.

**5.1.8.2 State-Listed Disposal Sites Near the Property**

Sixteen RTN listings on the MA RELEASE, SHWS, LUST, and/or LAST databases were identified in close proximity to the Subject Property and include:

**RTN 3-0022303, Fmr Heating Plant South Of, 333 Forest St (EDR Map ID 45)**

This site is listed in the MA RELEASE and SHWS databases, and is listed with a regulatory status of Class A-3 RAO.

A release of one pound of asbestos and 34.8 milligrams per kilogram (mg/kg) of arsenic was reported to MassDEP in 2002. This site is mapped approximately 0.25 miles west of the Subject Property and *is actually located at a higher elevation and potentially upgradient of the Subject Property*. This SHWS is presumed to be a former heating plant at the parcel adjacent to the northwest side of the Subject Property and approximately 700 feet upgradient of four residential buildings in the Intermediate Care Facility (ICF) for the Mentally Retarded off of Malone Park Drive. The federally owned parcel containing the heating plant was subdivided and redeveloped. TechLaw presumes that the heating plant site is located on land currently owned by Bentley College, although the street address suggests that it may be part of the New Jewish High School (Gann Academy) which does not directly abut the Subject Property parcel.

The EDR report indicates that an Immediate Response Action (IRA) and Release Abatement Measure (RAM) were completed at the Site, and that a Class A-3 RAO was achieved implementing an AUL. TechLaw obtained supplemental information for this Site from the MassDEP's website; this information is included in Exhibit C-13. Approximately 10,000 square feet of soil was reported to be contaminated with arsenic and asbestos, and the RAM Plan proposed capping the impacted soil with geotextile fabric and gravel. In addition, an AUL was implemented at the disposal site to protect the area from intrusive activities. Based on the non-mobile nature of the contaminants and "site closure" based on capping the impacted soil and implementation of an AUL, TechLaw does not consider this site likely to pose an environmental threat to the Subject Property.

**RTN 3-0018952 & RTN 3-0003078, UTM 4694592N 318350E, 313 Waverley Oaks Rd (EDR Map ID B10)**

RTN 3-0018952 is listed in the MA RELEASE and SHWS databases while RTN 3-0003078 is listed in the MA RELEASE, SHWS, LUST, and LAST databases. In the MassDEP database, the status of RTN 3-0018952 is listed as "RAONR" (RAO not required) and the status of RTN 3-0003078 is listed with a Class A-3 RAO.

According to the EDR report, this site is mapped 0.002 mile southeast of the Subject Property along Waverley Oaks Road. Based on TechLaw's review of aerial photographs and supplemental information obtained from the EDR Report and the MassDEP web site, this disposal site appears to be located southeast of the FDC Waverley Oaks Road entrance to the Subject Property and likely abuts the Subject Property beyond Waverley Oaks Road.

The EDR Report indicates that MassDEP was notified of a release of 10 gallons of petroleum and 100 gallons of water in November 1999. MassDEP assigned RTN 3-0018952 to the release, and an IRA was subsequently performed. The site did not require an RAO because it was determined that the Site was already listed under RTN 3-0003078 (which has the same street address and is listed as a fuel depot and former tank farm). The site is currently developed with an office building and parking lot. MassDEP Site Information for this "parent" site identifies the site as "Shell Product Dist Plant Fmr" and that after several remedial phases, a Class A-3 RAO was achieved for the disposal site (RTN 3-0003078) in 2004. A Class A-3 RAO indicates that a permanent solution was achieved through the use of an AUL, and that the contamination has not been reduced to background. As part of response actions under the MCP, the extent of contamination must be assessed to define the "disposal site" boundaries. Based on the groundwater flow direction to the south in this area of Waltham and site "closure" under the MCP via a Class A-3 RAO, TechLaw does not anticipate adverse environmental impacts to the Subject Property from this site.

**RTN 3-0020538, UTM 4694592N 318350E, 313 Waverley Oaks Rd (EDR Map ID B10)**

This site is listed in the MA RELEASE and SHWS databases, and the status listed on the MassDEP website is RAO not required.

According to the EDR report, this site is mapped 0.002 mile southeast of the Subject Property along Waverley Oaks Road. Based on TechLaw's review of aerial photographs and supplemental information obtained from the EDR Report and the MassDEP web site, this disposal site appears to be located southeast of the FDC Waverley Oaks Road entrance to the Subject Property and likely abuts the Subject Property beyond Waverley Oaks Road.

In 2001, MassDEP received notification that dibenzo(a,h)anthracene (1.9 mg/kg); benzo(a)anthracene (3.2 mg/kg); benzo(b)fluoranthene (8.8 mg/kg); total petroleum hydrocarbons (TPH) (4,700 mg/kg); barium (3,780 mg/kg); and lead (29,000 mg/kg) were present in soil at the site. The site status is listed as "RAO not required" because the site is "related to a Tier Classified Site." The Site Information on the MassDEP website does not specify which RTN the release has been linked with; however, the site name on the MassDEP website summary suggests that this RTN is associated with RTN 3-0003078. A RAM was completed at the site, but no further information was listed for the site. Based on the redevelopment of the site as office buildings and parking areas, the poor mobility of these contaminants of concern, and the site's location downgradient of the Subject Property, TechLaw does not consider this SHWS to be an environmental concern to the Subject Property.

**RTN 3-0013458, Gas Station, 277 Waverley Oaks Rd (EDR Map ID 12)**

This site is listed in the MA RELEASE and SHWS databases, and the status on the MassDEP website is listed as Class A-2 RAO.

According to the EDR report, this site is mapped 0.052 mile southwest of the Subject Property. Based on TechLaw's review of a 1995 aerial photograph and information from EDR and the MassDEP web site, this site appears to be located on the south side of Waverley Oaks Road and north of Beaver Street. MassDEP was notified in February 1996 of the release of 150 gallons of gasoline from a commercial gas pump, and MassDEP subsequently assigned RTN 3-0013458 to the release site. An IRA was completed in April 1996 and the site was "closed" with a Class A-2 RAO in February 1997. Based on this disposal site's downgradient location and presumed groundwater flow direction to the south, TechLaw does not consider this release of gasoline to pose an environmental threat to the Subject Property.

TechLaw notes that this site is currently addressed as 225 Waverley Oaks Road, according to a recently submitted Phase I Initial Site Investigation Report prepared for RTN 3-27761 for the Shell Branded Gasoline Station site at 225 Waverley Oaks Road.

**RTN 3-0000454, Duffy Brothers Construction, 411 Waverley Oaks Rd (EDR Map ID C14)**

This site is listed in the MA RELEASE and SHWS databases. The site status on the MassDEP website is listed as Class C-2 RAO.

According to the EDR report, this site is mapped 0.088 mile east-southeast of the Subject Property. Based on TechLaw's review of information obtained from EDR and the MassDEP web site, this site is located on the south side of Waverley Oaks Road and

directly abuts the residential neighborhood northwest of Waverley Oaks Road near its intersection with Parkview and Upton Roads. This residential neighborhood abuts the Subject Property to the southeast, and the disposal site boundary is approximately 100 feet from the Subject Site property line.

In 1987, MassDEP was notified of the release of an “unknown chemical of unknown type” and assigned RTN-30000454 to the release site. TechLaw reviewed a report for the site prepared by GZA GeoEnvironmental in May 2009 entitled *Phase IV As-Built Construction Report, Final Inspection Report, and Completion Statement Upland Area, 411 Waverley Oaks Road, Waltham, Massachusetts*; this report was available on the MassDEP website and included some site history and a site plan. The site is the location of a former waste oil facility which reportedly stored waste oil in “large volumes.” Drums, ASTs, and lagoons reportedly occupied the southern and downgradient portion of this site. Groundwater and the downgradient wetland area which discharges into Beaver Brook were impacted by the release of separate phase hydrocarbons (SPH). The northern portion of the site along the south side of Waverley Oaks Road is currently occupied by several large commercial buildings and parking areas and is the portion of the Site that has achieved a Class B-1 RAO which indicates that remedial actions have not been conducted because a level of “no significant risk” exists.

Various response actions have been completed at the site between 1999 and May 2009 including completion of IRA, Phase II, Phase III, Phase IV, and RAM reports. A Class B-1 partial RAO was achieved for part of the Site in 1996. The MCP status of upland areas of the site is listed as a Class C RAO Operation, Maintenance, and Monitoring because groundwater on this portion of the site is being monitored as part of the implementation of a groundwater treatment system. TechLaw considers contamination at this disposal site to pose low environmental risk to the Subject Property based on its downgradient or cross-gradient location, presumed groundwater flow to the south and/or south-southeast, and surface water flow to a brook which impacts areas well downgradient of the Subject Property.

**RTN 3-0010717, Rear Area of Site, 411 Waverley Oaks Road (EDR Map ID C15)**

This site is listed in the MA RELEASE and SHWS databases. The status of the site on the MassDEP website is listed as Class A-2 RAO.

According to the EDR report, this site is mapped 0.088 mile east-southeast of the Subject Property. Based on TechLaw’s review of information obtained from EDR and the MassDEP web site, this site is co-located with the Duffy Brother Construction site on the south side of Waverley Oaks Road. 411 Waverly Oaks Road directly abuts the residential neighborhood northwest of Waverley Oaks Road near its intersection with Parkview and Upton Roads; this residential neighborhood abuts the Subject Property to the southeast. The site name suggests that the area of contamination is likely on the east (rear) area of the parcel.

In 1994, MassDEP was notified of the release of a total of 40 gallons of water and an unknown concentration of PCBs from a tanker to a water body at the site. A wetland is located on the southeasterly portion of the 411 Waverley Oaks property. MassDEP assigned RTN 3-0010717 to the release and provided oral approval for implementation of

an IRA. A Class A-2 RAO was achieved at the site in May 1994 which indicates that a permanent solution was achieved but that contamination was not reduced to background levels. TechLaw considers PCB contamination at this disposal site to pose little to no environmental risk to the Subject Property based on its RAO status, the site's downgradient or cross-gradient location relative to the Subject Property, presumed regional groundwater flow to the south, and surface water flow to a brook which impacts areas well downgradient of the Subject Property.

**RTN 3-0025816, Rear of Property, 411 Waverley Oaks Road (EDR Map ID C19)**

This site is listed in the MA RELEASE and SHWS databases. The site status listed on the MassDEP website is RAO not required.

According to the EDR report, this site is mapped 0.088 mile east-southeast of the Subject Property. Based on TechLaw's review of information obtained from EDR and the MassDEP web site, this site is co-located with the Duffy Brother Construction site on the south side of Waverley Oaks Road. 411 Waverly Oaks Road directly abuts the residential neighborhood northwest of Waverley Oaks Road near its intersection with Parkview and Upton Roads; this residential neighborhood abuts the Subject Property to the southeast. The site name suggests that the area of contamination is likely on the east (rear) area of the parcel.

In 2006, MassDEP was notified of a release of water to a water body at the site but no other chemical constituents were reported. A wetland is located on the southern portion of the 411 Waverley Oaks property. MassDEP assigned RTN 3-0025816 to the release. An IRA was completed at the site approximately two months later. The EDR report indicates that the primary RTN for this site is 3-0000454 (refer to the discussion of ***Duffy Brothers Construction*** site above), and that an RAO is not required. The RTN was subsequently closed since response actions were being completed as part of 3-0000454. Based on this information, TechLaw does not consider this release to pose a threat to the Subject Property based on the site's downgradient and/or cross-gradient location relative to the Subject Property, presumed groundwater flow to the south or south-southeast, and surface water flow to a brook which impacts areas downgradient of the Subject Property.

**RTN 3-0017581, Waltham Federal Center, 424 Trapelo Road (EDR Map ID D20)**

This site is listed in the MA RELEASE and SHWS databases. The site status listed on the MassDEP website is Class C1 RAO.

According to the EDR report, this site is mapped 0.161 mile northwest of the Subject Property. Based on TechLaw's review of information obtained from EDR and the MassDEP web site, this site is located south of Trapelo Road, east of Forest Street, and abuts the west side of the Subject Property. TechLaw notes that MassDEP records the site name for RTN 3-0017581 as "Murphy Federal Ctr Boiler Plant."

In 1998, MassDEP was notified of a release of 0.5 inches of No. 4 fuel oil and 4 inches of non-aqueous phase liquids (NAPL). The EDR report indicates that, in 1999, an RAO was not required since the site was "related to" a Tier Classified site. (TechLaw presumes that RTN 3-0017581 is linked to LUST site RTN 3-0006013). However, in 2001, an IRA

completion statement was received by MassDEP and the current compliance status for this release is listed as a Class C1 RAO. A Class C RAO indicates that a temporary solution has been achieved since the site does not present a “substantial hazard” but the site has not yet achieved a condition of “no significant risk.”

Based on information obtained by TechLaw for LUST site 3-0006013, a release of petroleum was reported to MassDEP in 1994. and MassDEP received Phase I, Phase II, and Phase III Completion Statements between 1998 and 2001. This release was classified as a Tier II site, and a Class C RAO was achieved in June 2009. TechLaw obtained a copy of report from the MassDEP website entitled *Letter Report of Post Response Action Outcome Monitoring – Year Seven, Event One, April 2009 Ground-Water Gauging, Murphy Federal Center, Former Boiler Plant Underground Storage Tanks, 424 Trapelo Road, Waltham, MA 02154, MA DEP RTN 3-6013*. This report was prepared by Advent Environmental Inc. (ADVENT), and is included in Exhibit C-13 of this report. TechLaw notes that the report includes a site plan which shows a plume depicting the approximate extent of “separate phase oil” which was released from the former USTs at the boiler plant at that site. The leading edge of the separate phase oil plume is shown to be within 25 feet of the Subject Property and progressing down the hillside slope toward the Subject Property. Based on this information, TechLaw considers this release to be an off-site REC that has potential to impact the Property.

**RTN 3-0018887, FC Murphy Federal Center, 424 Trapelo Road (EDR Map ID D21)**

This site is listed in the MA RELEASE and SHWS databases. The site status is listed on the MassDEP website as Class A-2 RAO.

According to the EDR report, this site is mapped 0.161 mile northwest of the Subject Property. Based on TechLaw’s review of information obtained from EDR and the MassDEP web site, this site is located on the south side of Trapelo Road and abuts the northwest corner of the Subject Property.

In 1999, MassDEP was notified of a release of an unknown concentration of 2-methylnaphthalene, benzo(a)anthracene [2.1 parts per million (ppm)], and benzo(a)pyrene (2 ppm). A RAM was completed in 2001 and a Class A-2 RAO was achieved for the site in 2001 using a MCP Method 3 Risk Assessment. Based upon the information reviewed by TechLaw, the release contains relatively low concentrations of polynuclear aromatic hydrocarbons (PAHs). PAHs preferentially adsorb to soil and do not travel significant distances in groundwater. Based on the site status as “RAO” and the low mobility characteristics of the contaminants, TechLaw does not consider this release to be an environmental threat to the Subject Property.

**RTN 3-0006013, Waltham Federal Center, 424 Trapelo Road (EDR Map ID D20)**

This site is listed in the MA RELEASE and LUST databases. The site status is listed on the MassDEP website as Class C-1 RAO.

According to the EDR report, this site is mapped 0.161 mile northwest of the Subject Property. Based on TechLaw’s review of information obtained from EDR, the MassDEP web site, and the Waltham GIS website, this LUST site is located south of Trapelo Road,

east of Forest Street, and abuts the west side of the Subject Property. TechLaw notes that MassDEP records the site name for RTN 3-0006013 as “Murphy Federal Center - Boiler Plant UST.” This site is connected with SHWS identified as 3-0017581 (discussed previously). The site is listed with a Class C RAO, which indicates that a temporary solution has been achieved since the site does not present a “substantial hazard” but has not yet achieved a condition of “no significant risk.”

Based on information obtained by TechLaw for LUST site 3-0006013, a release of petroleum was reported to MassDEP in 1994. MassDEP received Phase I, Phase II, and Phase III Completion Statements between 1998 and 2001. This release was classified as a Tier II site and a Class C RAO was submitted in June 2009. TechLaw obtained a copy of report from the MassDEP website entitled *Letter Report of Post Response Action Outcome Monitoring – Year Seven, Event One, April 2009 Ground-Water Gauging, Murphy Federal Center, Former Boiler Plant Underground Storage Tanks, 424 Trapelo Road, Waltham, MA 02154, MA DEP RTN 3-6013*. The report was prepared by Advent Environmental Inc. (ADVENT), and is included in Exhibit C-13 of this report. TechLaw notes that the report includes a site plan which shows a plume showing the approximate extent of “separate phase oil” which was released from the former USTs at the boiler plant at that site. The leading edge of the separate phase oil plume is shown to be within 25 feet of the Subject Property and progressing down the hillside slope toward the Subject Property. Based on this information, TechLaw considers this release an off-site REC that has potential to impact the Subject Site.

**RTN 3-0015749, No Location Aid, 426 Trapelo Road (EDR Map ID D23)**

This site is listed in the MA RELEASE and SHWS databases. The site status is listed on the MassDEP website as Class A-1 RAO.

According to the EDR report, this site is mapped 0.165 mile northwest of the Subject Property. Based on TechLaw’s review of information obtained from EDR and the MassDEP web site, this site is located on Trapelo Road. The exact location of the site could not be determined although it appears that the site is likely to be associated with the Waltham Federal Center at 424 Trapelo Road which is adjacent to the northwest corner of the Subject Property.

In 1997, MassDEP was notified of a release of 10 gallons of diesel fuel and 12 gallons of diesel fuel which is assumed by TechLaw to have occurred from a motor vehicle incident at the site. Immediate approval of an IRA was provided by MassDEP the same day as the release, and a Class A-1 RAO was submitted for the site two months later. Since the release was cleaned up to background levels, TechLaw does not consider this release to pose an environmental threat to the Subject Property.

**RTN 3-0027761, Shell Service Station #137873, 225 Waverley Oaks Road (EDR Map ID 24)**

This site is listed in the MA RELEASE and SHWS databases. According to the MassDEP website, a Phase II Scope of Work was submitted and MCP response actions are continuing on the site.

According to the EDR report, this site is mapped 0.169 mile southwest of the Subject Property. Based on TechLaw's review of information obtained from EDR and the MassDEP web site, this site is located north of Beaver Street and east of Waverley Oaks Road and is the Shell Station at the intersection of these two roads.

MassDEP was notified of a release of aliphatic and aromatic petroleum hydrocarbons and methyl tert-butylether (MTBE) associated with a release of gasoline from an unknown source at the site in June 2008. A Phase I Initial Site Investigation report was submitted to MassDEP by Sovereign Consulting, Inc. (SCI) in May 2009. TechLaw reviewed the SCI Phase I report and notes that, based upon Figure 3 in that report, groundwater flow direction across this disposal site is to the south-southeast. Since the site is downgradient of the Subject Property and groundwater flows away from the Subject Property, TechLaw does not consider this site to pose an environmental threat to the Subject Property.

**RTN 3-0028049, University of Massachusetts, 225-227 Beaver Street (EDR Map ID 39)**

This site is listed in the MA RELEASE and SHWS databases. According to the MassDEP website, a Release Notification has been made by the responsible party and MCP response actions are continuing on the site.

According to the EDR report, this site is mapped 0.209 mile southwest of the Subject Property. TechLaw reviewed information obtained from EDR, the Waltham Assessors office, and the MassDEP web site. This site actually abuts the Subject Property to the south, and is shown as Waltham Assessor Parcel ID R054 001 0001 which is owned by the State of Massachusetts.

MassDEP was notified of a release of cadmium (9.1 mg/kg), chromium (37.5 mg/kg), and lead (1,520 mg/kg) in October 2008 at a facility operated by the University of Massachusetts. A Notice of Responsibility (NOR) was issued to the University of Massachusetts (Amherst) in November 2008. No additional information was found on the MassDEP website for this RTN. However, TechLaw contacted Mr. Ethan Gould [MassDEP Northeast Regional Office (NERO)] and obtained copies of the Release Notification Forms (RNF) for the release. Mr. Gould also noted that a RAM Plan for the release at 240 Beaver Street (RTN 3-0028050) was available for download from the MassDEP website. After reviewing the RNF forms and RAM Plan, TechLaw contacted Ms. Theresa Bechta, Assistant Director for Environmental and Hazardous Materials Management at UMASS Amherst for additional information. Copies of the RNF forms for RTN 3-0028048, 3-0028049, and 3-0028050 and RAM Plan report are included in Exhibit C-13.

According to these information sources, a wetland area identified as "Parcel 2" was used as part of the Phoenix Project, which was a joint research project conducted by EPA, MassDEP [previously known as the Massachusetts Department of Environmental Quality and Engineering (DEQE)], and the city of Waltham in 1978. Fly ash containing heavy metals was spread over the wetland area to assess its impact on growth of vegetation. According to Ms. Bechta, U-MASS has "plenty of records" that demonstrate that heavy metals contamination is not migrating, that it has good vegetation covering the contaminants, and that groundwater in the wetlands has not been adversely impacted with elevated levels of dissolved metals. She also indicated that U-MASS is working with



MassDEP and the Waltham Conservation Commission to isolate the wetland and place an AUL on the parcel. Heavy metals have an affinity for adsorbing to soil or solid particles and, as such, tend not to be highly mobile in the environment unless the soil is transported by mechanisms such as air or water.

This wetland disposal site is on the parcel south of the Property and its exact location and the extent of contamination has not been fully defined by ECS, according to Dr. Bruce Tease, the LSP of record. Although the Property is divided from the UMASS parcel by a chain-link fence, it is not known how and where fly ash was applied to the UMASS parcel and whether heavy metals contamination may have been mobilized and deposited on the Subject Property via wind or water (flooding). Based on the limited amount of information obtained from Ms. Bechta and ECS, the contamination on this southwesterly adjacent parcel may have had an impact on the southern portion of the Subject Property.

**RTN 3-28048, U-MASS Waltham, 240 Beaver Street (EDR Map ID J41)**

This site is listed in the MA RELEASE and SHWS databases. According to the MassDEP website, a Release Notification has been made by the responsible party and MCP response actions are continuing on the site.

According to the EDR report, this site is mapped 0.219 miles southwest of the Subject Property. TechLaw reviewed information obtained from EDR, the Waltham Assessors office, and the MassDEP web site. This site is located on the south side of Beaver Street, and is shown as Waltham Assessor Parcel ID R053 003 0001 which is owned by the State of Massachusetts and operated by the University of Massachusetts (UMASS) Amherst Agricultural School.

MassDEP was notified of a release of petroleum constituents including C11-C22 aromatic petroleum hydrocarbons (1,510 mg/kg) and C9-C18 aliphatic petroleum hydrocarbons (5.5 mg/L in groundwater and 3,150 mg/kg in soil) in October 2008 at the facility. A NOR was issued to UMASS Amherst in November 2008. According to a RAM Plan prepared by consulting firm ECS for RTN 3-0028050, this petroleum release was associated with the boiler house located on the parcel south of Beaver Street.

Based on the site's distance and downgradient location relative to the Subject Property, and regional groundwater flow in a generally southerly direction, this site is not considered an environmental concern to the Subject Property.

**RTN 3-0028050, U-MASS Waltham, 240 Beaver Street (EDR Map ID 39)**

This site is listed in the MA RELEASE and SHWS databases. According to the MassDEP website, a Release Notification has been made by the responsible party and MCP response actions are continuing on the site.

According to the EDR report, this site is mapped 0.219 miles southwest of the Subject Property. TechLaw reviewed information obtained from EDR, the Waltham Assessors office, and the MassDEP web site. This site is located on the south side of Beaver Street, and is shown as Waltham Assessor Parcel ID R053 003 0001 which is owned by the State of Massachusetts and operated by the UMASS Amherst Agricultural School.

MassDEP was notified of a release of cadmium (40.9 mg/kg), chromium (92.8 mg/kg), lead 3,770 mg/kg), and arsenic (23.2 mg/kg) in October 2008 at the facility operated by the University of Massachusetts. A NOR was issued to the University of Massachusetts (Amherst) in November 2008. Information related to the heavy metals release was presented in the RAM Plan downloaded from the MassDEP website and provided in a conversation with Ms. Theresa Bechta, Assistant Director for Environmental and Hazardous Materials Management at U-Mass Amherst. A copy of the RNF form for RTN 3-0028050 and the RAM Plan report are included in Exhibit C-13.

According to these information sources, an upland area identified as “Parcel 1” was used during the Phoenix Project (a joint research project conducted by EPA, DEQE, and the city of Waltham in 1978) to assess the impact of spreading of fly ash containing heavy metals on growth of vegetation. According to Ms. Bechta, the soil impacted by heavy metals on Parcel 1 was limited to the upper soil layer and was being remediated (via excavation from the site). The RAM Plan asserted that groundwater impacts by heavy metals were unlikely.

This site is located at a lower elevation and is hydraulically downgradient of the Subject Property, and groundwater flow direction in the region is generally southerly (away from the Property and toward this site). Based on this information and its distance from Subject Property, this site is not considered an environmental threat to the Subject Property.

**RTN 3-0015883, U-MASS Waltham, 240 Beaver Street (EDR Map ID J41)**

This site is listed in the MA RELEASE and LUST databases. The site status listed on the MassDEP website is Class A-2 RAO.

According to the EDR report, this site is mapped 0.219 miles southwest of the Subject Property. TechLaw reviewed information obtained from EDR, the Waltham Assessors office, and the MassDEP web site. This site is located on the south side of Beaver Street, and is shown as Waltham Assessor Parcel ID R053 003 0001 which is owned by the State of Massachusetts and operated by the University of Massachusetts Agricultural School.

MassDEP was notified of a release of 93 gallons of gasoline and a 139 ppmv gasoline headspace reading in January 1998 at a facility operated by the UMASS Amherst Agricultural Center. An IRA and Phase I were completed, and the site was classified as a Tier II site. MassDEP received the RAO statement in 2001 for a Class A-2 RAO which indicates that a permanent solution was achieved but that contamination was not reduced to background. Based on the parcel's distance and downgradient location relative to the Subject Property and groundwater flow generally in a southerly direction, this site is not considered an environmental concern to the Subject Property.

**5.1.8.3 State-Listed Disposal Sites on the Orphan List**

TechLaw identified two “Orphan” sites within the applicable ASTM radius of the Subject Property, but neither site is in close proximity to the Subject Property and TechLaw does not expect any adverse impact to the Subject Property based on the distance, downgradient, and/or crossgradient locations of these two sites:

- **RTN 3-0019560, Fitzgerald School, Beal Rd** - This MA RELEASE/LUST site is located at 140 Beal Road approximately 0.33 miles south of the Subject Property beyond Beaver Street, a set of railroad tracks, and Clematis Brook. According to the EDR Facility Details Report, a release of No.2 fuel oil occurred from a UST in May 2000 at the school. A Class A-2 RAO was achieved in July 2000, indicating that a permanent solution was achieved but that contamination was not reduced to background.
- **RTN 3-0023111, No Location Aid, Bishop Forest Rd** – This MA RELEASE/SHWS site is located somewhere along Bishops Forest Drive between 2,500 feet and one mile west-northwest of the Subject Property. According to the EDR Facility Details Report, a release of 25 gallons of No. 2 fuel oil impacted a roadway. A Class A-1 RAO was achieved for the site, indicating that contamination was reduced to background.

### 5.1.9 State Solid Waste/Landfill Facilities (SWLF)

A database of SWLF is prepared by MassDEP. The Property is not listed as a SWLF facility. No SWLF facilities are listed within one-half mile of the Property.

### 5.1.10 State Underground Storage Tank List (UST)

The Massachusetts Department of Fire Services Office of Public Safety compiles a list of UST locations.

The Property is listed as an UST facility. Ten USTs were removed from the Walter E. Fernald Developmental Center and no active USTs appear on EDR's database. The locations and removal dates for the ten removed USTs were not provided in the EDR report. According to the EDR report, the tank volumes and products stored in the removed USTs are tabulated below:

**Table 5-1**  
**USTs Removed from the Fernald Developmental Center**

<b>Tank ID No.</b>	<b>Volume (gallons)</b>	<b>Product Stored</b>	<b>Tank Construction Type</b>
1	4,000	Gasoline	Steel
2	4,000	Gasoline	Steel
3	750	Diesel	Steel
4	550	Diesel	Steel
5	1,500	Diesel	Reinforced Steel
6	1,000	Diesel	Reinforced Steel
7	1,000	Diesel	Reinforced Steel
8	500	Gasoline	Steel
9	1,000	Diesel	Steel
10	1,000	Gasoline	Steel

TechLaw notes that the existing USTs, including the two USTs at the Power Plant, do not appear on the table above.

One registered UST facility is listed adjacent to the Property:

- **General Services Administration, 424 Trapelo Road (Facility ID 40051)** - Three removed USTs are listed for the facility which is formally known as the Frederick C. Murphy Federal Center. A 2,000-gallon gasoline UST, a 2,000-gallon diesel UST, and a 550 gallon diesel UST were removed from the facility. No active registered USTs appear in the EDR database report for this facility.

#### **5.1.11 State Institutional Control/Engineering Control Registries**

The MassDEP compiles a list of Institutional Control and Engineering Controls.

The Property is listed as having an Institutional Control or Engineering Control. An AUL for an 0.4-acre parcel was implemented at the Site in association with the closure of a No. 6 fuel oil release at the Power Plant (RTN 3-0013467). This AUL is discussed further in section 5.2.3.5 of this report.

#### **5.1.12 State Spills Listing**

The MassDEP compiled a list of Spills sites. Four MA Spills sites are identified for the 200 Trapelo Road address:

- **Spill ID N80-5148** – On November 30, 1980, a release of 200 gallons of No. 6 fuel oil was reported. The case was subsequently closed.
- **Spill ID N86-0944** – On September 29, 1986, a leak of gasoline was reported from a UST. The case was subsequently closed.
- **Spill ID N92-0350** – On March 16, 1992, contaminated soil was reported from an unknown source. The case was subsequently closed.
- **Spill ID N92-0797** – On June 24, 1992, a release of waste oil was reported from a drum that was dumped on the FDC property. The case was subsequently closed.

No further information was provided in the EDR report related to these releases.

#### **5.1.13 Municipal File Review Findings**

TechLaw conducted a records review at the City of Waltham municipal offices for information related to the Property. Copies of pertinent records are included in Exhibit C-14.

##### **5.1.13.1 Assessors Office**

TechLaw reviewed historic Assessors Property Record Cards (PRCs) dated 1981. The deed reference for APN R045 001 0001 (the 163.049 acre parcel) was identified as located in Middlesex County Registry of Deeds (MCRD) Book 5600, Page 550 with a date of October 22, 1931. Two PRCs were found for APN R036 008 0001 (the 32.01 acre parcel) which indicate that 282 Trapelo Road was conveyed to the Commonwealth of Massachusetts on August 17, 1931 (MCRD Book 5584, Page 383) and 338 Trapelo Road was conveyed to the Commonwealth of Massachusetts on May 22, 1930 (MCRD Book 5463, Page 286).

In addition, copies of several Assessors ownership cards were reviewed which indicated incremental land takings and acquisitions by the Commonwealth dating back to the late 1880s.

#### **5.1.13.2 Engineering Department**

The Waltham Engineering Department had no records for water and sewer lines for most of the Property buildings except for water lines to the residence at 338 Trapelo Road (water supply only) and the residence at 282 Trapelo Road (water and sewer lines). According to the Engineering Department, the city does not maintain records for the majority of FDC buildings since it is a state property. The Engineering Department's Billing Clerk, however, noted that city records show inactive water and sewer connections for 180, 282, and 338 Trapelo Road.

#### **5.1.13.3 Health Department**

The Waltham Health Department provided TechLaw with a copy of a Public Involvement Notification Letter related to RTN 3-21892 (Malone Park Building No. 21), RTN 3-21893 (Malone Park Building No. 23), and RTN 3-13467 (The Fernald Center Power Plant, which includes a copy of the recorded AUL).

#### **5.1.13.4 Fire Prevention Bureau**

TechLaw provided a "21E" request to the Waltham Fire Prevention Bureau on June 8, 2009. A response was received on July 17, 2009. The Waltham Fire Prevention Bureau provided records for two USTs installed at the Property:

**Table 5-2**  
**Waltham Fire Prevention Records for USTs Installed at 200 Trapelo Road**

<b>No. of Tanks</b>	<b>Volume (Gals)</b>	<b>Product</b>	<b>Date Installed</b>	<b>Comments</b>	<b>Presumed Location</b>
1	20,000	No. 6	11/22/1986?	"Installed and buried before inspection"	Power Plant, west side
1	20,000	No. 6	11/22/1986?	"Installed and buried before inspection"	Power Plant, west side

UNK – Unknown

The installation dates for the two 20,000-gallon USTs above (which are presumed to be the replacement tanks for the three No. 6 fuel oil USTs removed in October 1996) appear to be incorrect. The Waltham Fire Prevention Bureau also provided TechLaw with records for seven ASTs installed at the Property:

**Table 5-3**  
**Waltham Fire Prevention Records for ASTs Installed at 200 Trapelo Road**

<b>No. of Tanks</b>	<b>Volume (Gals)</b>	<b>Product</b>	<b>Date Installed</b>	<b>Comments</b>	<b>Presumed Location</b>
4	330	No. 2	6/20/2002	"For htg"	Malone Park residences
1	275	UNK	10/2/2001	"For htg"	Unknown

No. of Tanks	Volume (Gals)	Product	Date Installed	Comments	Presumed Location
2	275	UNK	4/15/1998	"For htg"	Unknown

UNK – Unknown

In addition, seventeen USTs were documented as having been removed from the Property by the Waltham Fire Prevention Bureau. These USTs include:

**Table 5-4**  
**Waltham Fire Prevention Records for USTs Removed from 200 Trapelo Road**

No. of Tanks	Volume (Gals)	Product	Date Removed	Comments	Presumed Location
1	22,000	No. 6	10/17/1996	"Oil in ground. DEP notified"	Power Plant, west side
1	25,000	No. 6	10/17/1996	"Oil in ground. DEP notified"	Power Plant, west side
1	29,000	No. 6	10/17/1996	"Oil in ground. DEP notified"	Power Plant, west side
1	1,000	UNK	5/20/1997	"Tank ok"	Unknown
1	500	UNK	5/21/1997	"Tank ok"	Unknown
2	4,000	Gasoline	5/22/1997	None	Farm & Grounds Building
1	1,000	Gasoline	5/29/1997	"Tank appears ok"	Power Plant, northeast side
1	1,000	UNK	9/16/1997	"Clean Appearance"	Unknown
1	750	UNK	10/30/1998	"Tank & hole ok"	Unknown
1	1,500	UNK	4/27/2001	"Tank & site appear ok"	Unknown
1	1,000	UNK	4/27/2001	"Tank & site appear ok"	Unknown
1	500	UNK	4/27/2001	"Tank & site appear ok"	Unknown
4	500	No. 2	6/27/2002	"3-tank & hole appear clean. 1 had oil on exterior bottom of tank. DEP notified."	Malone Park residential buildings

UNK - Unknown

The EDR report indicated that ten USTs had been removed from the Property. TechLaw concludes that limited amount of information provided by the Waltham Fire Prevention Bureau is not sufficiently detailed to confirm the location and number of USTs and ASTs historically present on the Property or the location and number of USTs and ASTs currently in use at the Property. The data provided above does not correlate well with the UST and AST information in the FDC SPCC Plan.

## **5.2 Massachusetts DEP File Review**

As part of this ESA, TechLaw completed a file review at MassDEP's NERO. Per the recommendation of DCAM personnel, copies of only the most pertinent MCP reports were obtained for each of the RTNs associated with FDC. Copies of these reports and the MassDEP Site Information summary are included in Appendix 8. To be consistent with the MassDEP web site, the Site Name associated with each RTN below was obtained from the online MassDEP Site Information summary.

Of the ten releases on record for FDC, five RTNs are associated with the Power Plant building and include RTN 3-0010367, RTN 3-0011878, RTN 3-0013467, RTN 3-0015149, and RTN 3-0015442 which are described in further detail in sections 5.2.1 through 5.2.5. The remaining RTNs are summarized in sections 5.2.6 through 5.2.10 and are associated with the Farm & Grounds building (RTN 3-10725); the Thom Building (RTN 3-0021380); Malone Park Building No. 21 (RTN 3-0021892); Malone Park Building No. 23 (RTN 3-0021893); and several buildings and roadways (RTN 3-0015121). A permanent solution [(i.e., Response Action Outcome (RAO))] has been achieved for all ten releases; only one of the sites involved the implementation of an AUL.

### **5.2.1 RTN 3-0010367, Within Complex on Chapel St @ Power Plant**

File information for this RTN obtained during the MassDEP file review and a website search is provided in Exhibit C-4. This release has a current status of Class C RAO and includes implementation of an AUL.

#### **5.2.1.1 Phase I Site Investigation**

According to the Phase I Site Investigation completed on July 11, 1995 by Lord Associates, Inc. (LAI), a release of No. 6 fuel oil occurred on December 29, 1993 after a UST on the west side of the Power Plant was filled. The release was attributed to oil expanding upon heating, and No. 6 fuel oil overflowed from the UST spill box to the ground surface. Some of the oil flowed over the nearby concrete retaining wall into the adjacent brook, and free phase oil and oil-stained debris was observed in the brook as far as 300 feet south and downgradient of the Power Plant.

Upon notification, MassDEP provided verbal approval for an IRA. Response actions included placement of sorbent boom at several locations in the brook, placement of a containment fence 150 feet downgradient of the power plant, collection of approximately 150 gallons of free phase product, and stockpiling of oil-contaminated debris (e.g., wood, soil, hay, and rocks) collected from in and around the brook. In April 1994 per the request of MassDEP, all remaining No. 6 fuel oil was removed from the fill boxes and placed into drums. When the fill boxes were steam cleaned, LAI noticed that the bottom of the fill boxes were open. In May 1994, two surface water samples were collected from upgradient and downgradient locations in the stream and analyzed for TPH and PAH

analysis; laboratory analysis indicated that no contaminants were present in the surface water samples. The LAI report recorded the size of the three No. 6 fuel oil USTs as 23,000, 25,000, and 28,000 gallons and that they had been installed at the facility in 1954.

In December 1994, LAI conducted an assessment of the extent of soil and groundwater contamination in the vicinity of the USTs as part of the MCP Phase I Initial Site Investigation. LAI advanced four soil borings to a depth ranging from 11 to 16 feet below ground surface (bgs) in the area upgradient and downgradient of the No. 6 fuel oil USTs, and completed all four borings as monitoring wells. Soil samples were collected for TPH and groundwater samples were collected for TPH and VOCs. Contamination was not detected in groundwater, but TPH was detected in two borings at concentrations of 68 and 290 mg/kg. Three surface water samples were collected from upstream and downstream locations in the adjacent stream in January 1995 and analyzed for TPH, but no contamination was detected in the surface water samples. Two composite sediment samples were collected from the stream and analyzed for TPH; sediment collected from the base of the retaining wall adjacent to the USTs contained TPH at a concentration of 966 mg/kg and a second sediment sample collected approximately 200 feet downstream of the Power Plant contained TPH at a concentration of 687 mg/kg. LAI interviewed FDC facility personnel who indicated that approximately 200 gallons of No. 6 fuel oil was released onto the ground and into the stream in November 1980.

LAI stated that, although low concentrations of TPH were present in soil and sediment samples, environmental receptors were not threatened [based upon the absence of threatened species, areas of critical environmental concern (ACEC), or fish habitats near the Power Plant] and no private or municipal water supply wells were likely to be impacted.

#### **5.2.1.2 Linking of RTN 3-0010367 with RTN 3-0013467**

TechLaw noted that it appears that RTN 3-0010367 and RTN 3-0013467 were linked in 1997 because the Phase I and Tier Classification report, the Phase III Comprehensive Site Assessment (CSA) report, and the Class C RAO statements for these two RTNs were received by MassDEP on the same day. These releases occurred in close proximity to one another. TechLaw subsequently confirmed in a telephone conversation with Mr. Christopher Coolen of the MassDEP Bureau of Waste Site Cleanup (BWSC) Permits Division that the two RTNs are connected, and the Release Log Detail in the internal MassDEP database accessed by Mr. Coolen indicates that RTN 3-0013467 is the “daughter” of RTN 3-0010367.

#### **5.2.1.3 Phase III Remedial Action Plan (RAP) and Class C RAO**

Vertex Engineering Services, Inc. (Vertex) prepared a Phase III Remedial Action Plan (RAP) and Class C RAO Statement dated June 25, 2002 which was subsequently received by MassDEP on June 28, 2002. This report was not available for TechLaw’s review in the MassDEP files; however, this report was summarized in the RAO statement



for RTN 3-0013467 which was prepared by Coneco Engineers & Scientists, Inc. (Coneco). Coneco reviewed the Phase III RAP report and summarized response activities related to either or both of these RTNs:

- December 29, 1993 – Between 150 and 300 gallons of No. 6 fuel oil were released due to a “UST failure” which resulted in impacts to the adjacent stream. MassDEP assigned RTN 3-0010367 to the release site.
- June 1994 - An IRA completion statement was submitted to MassDEP.
- 1995 - Coneco reported that LAI prepared a Phase I Site Investigation and Tier II Classification Scoresheet; TechLaw notes, however, that the MassDEP website indicates that the Phase I Completion and Tier II Classification report was received by MassDEP on April 3, 1997.
- February 20, 1996 – Another oil release was reported to MassDEP near the UST area adjacent to the Power Plant “in the vicinity of a concrete retaining wall located between the three No. 6 fuel oil USTs at the Site.” Vertex reported that this release also impacted the adjacent stream, and MassDEP subsequently assigned RTN 3-0013467 to this release. After the February 20, 1996 notification, Vertex subsequently conducted an IRA which included (1) deployment of oil absorbent pads and booms at the base of the retaining wall and in the stream, (2) removal of the three USTs between July and December 1996, and (3) removal of 1,000 cubic yards of No. 6 fuel oil impacted soil and 15,000 gallons of impacted groundwater. The USTs were reportedly installed in 1954.
- August 1998 – Vertex completed a Phase II CSA report and reported that light non-aqueous phase liquid (LNAPL) consisting of No. 6 fuel oil measured greater than 0.5 inches in product thickness in two monitoring wells located inside the Power Plant building. The monitoring wells were advanced during Phase II assessment activities. LNAPL was not detected in any other of the wells completed in the vicinity of the Power Plant, and concluded that groundwater was flowing in a southwesterly direction across the disposal site. Vertex concluded that the LNAPL was confined to a “localized area beneath the concrete floor of the Power Plant building” and that, due to the presence of LNAPL, a condition of “no significant risk” did not exist at the site.
- June 25, 2002 – Vertex prepared a Phase III RAP and Class C RAO statement for the site. Vertex stated that LNAPL remained present in some site monitoring wells at a thickness of greater than 0.5 inches as recently as March 2002. Vertex recommended groundwater monitoring and product removal as the remedial action alternative for the site. Vertex also indicated that a temporary solution (i.e., a Class C RAO) was achieved since remedial actions had eliminated substantial hazards at the Site but that a condition of “no significant risk” did not exist at the

site. No further Site Information was posted on the MassDEP website after June 2002.

### **5.2.2 RTN 3-0011878, Rear Gate Off Waverley Oaks Road**

File information for this RTN obtained during the MassDEP file review and a website search is provided in Exhibit C-3. This release has a current status of Class A-1 RAO.

According to the RAO Statement completed by Clean Harbors Environmental Services, Inc. (CHES) on January 11, 1995, approximately 30 gallons of No. 6 fuel oil were released on November 21, 1994 during the filling of one of three USTs located on the west side of the power plant. The release occurred when a clogged vent pipe created back pressure, forcing oil from the tank's fill port. Oil flowed across the pavement and over a retaining wall into the stream located west of the Power Plant building. Quality Fuel and Transportation, Inc. (Quality) and FDC personnel placed absorbent boom across the ground and several locations along the stream to contain the oil release. MassDEP was notified prior to the two-hour notification deadline, and the MassDEP representative approved of IRA activities which included (1) application of Speedi-Dri to the pavement, (2) deployment of boom across the stream, (3) collection of oil using absorbent materials, (4) wiping down of residual oil on the concrete retaining wall, (5) drumming of spent boom, Speedi-Dri, and absorbent materials, and (6) removal of residual oil from rocks in the stream. After cleanup was completed, CHES inspected the stream and observed oil-impacted sediment along the brook. CHES obtained approval from MassDEP and the Waltham Conservation Commission to remove two 55-gallon drums of impacted sediment removed from three locations along the stream bed. Sediment confirmation samples could not be collected because all the oily sediment was removed and only large rocks and boulders remained. CHES concluded that the response actions resulted in the removal of all released oil, and that no residual impacts from this release remained. Since a level of "no significant risk" was achieved, remedial actions resulted in a Class A-1 RAO.

### **5.2.3 RTN 3-0013467, Power Plant Near Waverly Oak Entrance**

File information for this RTN obtained during the MassDEP file review and a website search is provided in Exhibit C-7. This release has a current status of Class A-3 RAO and includes implementation of an AUL.

#### **5.2.3.1 Notification**

According to the RAO Statement completed by Coneco on March 19, 2008, RTN 3-0013467 was assigned by MassDEP on February 20, 1996, after No. 6 fuel oil was observed on the west side of the Power Plant in the vicinity of the concrete retaining wall located near three No. 6 fuel oil USTs. As discussed in section 5.2.1, RTN 3-0013467 was subsequently linked with RTN 3-001367.

#### **5.2.3.2 IRA**

The IRA which addressed this release involved deployment of oil absorbent pads and boom in the adjacent stream as well as removal of the three approximately 42-year old USTs. The USTs were removed between July and December 1996. In addition, approximately 1,000 cubic yards of No. 6 fuel oil impacted soil and 15,000 gallons of impacted groundwater were removed from the site during IRA activities. Facility personnel interviewed as part of this ESA stated that since the whole facility was powered by the Power Plant, the tanks needed to be removed one at a time to avoid any interruption of services to the facility.

#### **5.2.3.3 Phase II CSA**

Coneco reported that in August 1998, Vertex completed a Phase II CSA report and reported that LNAPL consisting of No. 6 fuel oil measured greater than 0.5 inches in product thickness in two monitoring wells located inside the Power Plant building. The monitoring wells were advanced during Phase II assessment activities. LNAPL was not detected in any other of the wells completed in the vicinity of the Power Plant, and determined that groundwater was flowing in a southwesterly direction across the disposal site. Vertex concluded that the LNAPL was confined to a “localized area beneath the concrete floor of the Power Plant building” and that, due to the presence of LNAPL, a condition of “no significant risk” did not exist at the site. TechLaw notes that the MassDEP Site Information indicates that the Phase II Completion Statement was received on January 15, 1999.

#### **5.2.3.4 Phase III RAP and Class C RAO**

According to the Coneco RAO completed dated March 19, 2008, Vertex prepared a Phase III RAP and Class C RAO Statement on June 25, 2002. These findings were summarized by Coneco. Vertex reported that LNAPL remained present in some site monitoring wells at a thickness of greater than 0.5 inches as recently as March 2002. Vertex recommended groundwater monitoring and product removal as the remedial action alternative for the site. Vertex also indicated that a temporary solution (i.e., a Class C RAO) was achieved since remedial actions had eliminated substantial hazards at the Site but that a condition of “no significant risk” did not exist at the site.

#### **5.2.3.5 Class A RAO and AUL**

Coneco completed a Class A-3 RAO statement on March 19, 2008. A Class C RAO related to this release was previously submitted by Vertex in 2002. A Class C RAO is a temporary cleanup. The MCP requires that every five years, sites with a Class C RAO must be re-evaluated to determine whether a Class A or Class B RAO is possible. Under the MCP, all sites are expected to achieve either a Class A or Class B RAO. A Class A-3 RAO is considered a “permanent solution” at sites where contamination has not been reduced to background and for which an AUL has been implemented as part of the

“permanent solution.” AULs are recorded at the Registry of Deeds and limit future exposure to contaminants remaining at a site.

Beginning in August 2003, Coneco began quarterly groundwater monitoring at the site and submitted groundwater samples for Extractable Petroleum Hydrocarbon (EPH) analysis. In May 2007, Coneco advanced two additional soil borings south and east of the Power Plant to further define the boundaries of the “disposal site.” The two borings were completed as monitoring wells and two soil boring samples were submitted for EPH analysis. In addition, Coneco completed a Stage I Environmental Screening to characterize potential exposure to Site biota and habitats which may have been impacted by the release. Based on groundwater elevations in the two new and seven previously installed site wells, groundwater flow direction was determined to be in a southwest to southerly direction. On May 2007, groundwater depths within the nine site wells ranged from 0 to 10.4 feet bgs. LNAPL was last detected in one well, MW-B2 (located inside the Power Plant building), in October 2005 and has not been detected at thicknesses greater than 0.1 inch in any site well in the four subsequent quarterly sampling rounds. No EPH constituents were detected in groundwater from the nine groundwater samples collected in May 2007.

Coneco concluded that groundwater at the Site is classified under the MCP as GW-2 and GW-3 and that a condition of “no significant risk” exists at the Site with respect to groundwater. Groundwater exposure point concentrations (EPCs) for all site wells were calculated well below the applicable GW-2 and GW-3 MCP Method 1 standards for the C9-C18 aliphatic hydrocarbon fraction, the C19-C36 aliphatic hydrocarbon fraction, and the C11-C22 aromatic hydrocarbon fraction. Coneco did not calculate EPCs for PAH target compounds. Detectable concentrations of PAHs were not reported by the laboratory between January 2006 and May 2007. In addition, the NAPL Upper Concentration Limit (UCL) of 0.5 inches has not been exceeded during the final four groundwater sampling rounds.

For the purposes of the MCP Method 1 Risk Assessment, Coneco compared soil EPCs with the most conservative MCP Method 1 S-1/GW-2 and S-1/GW-3 standards to account for potential future site uses which may involve redevelopment of the Site. Coneco stated that for current site uses, a condition of NSR exists but for potential future development scenarios involving residential development, a condition of NSR does not exist. Therefore, as part of the conditions of the Class A-3 RAO, Coneco implemented an AUL at the Disposal Site to prevent future potential exposure to contaminated soil.

Further, Coneco concluded that the sources of contamination have been removed and that an Imminent Hazard (IH) and a condition of Substantial Release Migration (SRM) do not currently exist at the Site. Coneco further concluded that it was not feasible to reduce contamination to background (i.e., “non-detectable”) conditions.

The AUL for the Site was recorded in Middlesex County Registry of Deeds (MCRD) Plan Book 50880, Pages 306 through 325. The AUL applies to a 17,835 square foot (approximately 0.4 acre) surveyed parcel which is located along the south side of the

Power Plant building and includes approximately one-half the footprint of the Power Plant building. The AUL applies to soil between 2 and 15 feet below surface grade within the surveyed area. Activities prohibited within the AUL area include use of buildings within the AUL area as an office, store, residence, school, or daycare; cultivation of fruits and vegetables for human consumption; recreational and leisure activities; and relocation of contaminated soils within the designated area.

#### **5.2.4 RTN 3-0015149, Power Plant, 200 Trapelo Road**

File information for this RTN obtained during the MassDEP file review and a website search is provided in Exhibit C-9. This release has a current status of Class B-1 RAO.

As part of an underground tank closure at the FDC Power Plant on May 29, 1997, Vertex observed the removal of a 1,000-gallon gasoline UST which was situated between the north wall of the Power Plant building and Chapel Street. The UST stored gasoline for a generator located inside the Power Plant building. The UST was pumped of gasoline and water prior to its removal from the ground. The UST was slightly weathered but had “no apparent areas of significant corrosion or holes.” Vertex collected soil samples from the excavation base and side walls for soil headspace screening using a photoionization detector (PID). Vertex did not observe visual and olfactory indications of gasoline contamination in soil side wall samples; however, Vertex observed a gasoline odor in the soil collected from the bottom of the excavation. Groundwater was not observed at the base of the 8-foot deep excavation. Five soil headspace screening samples were then collected from the four sidewalls and base of the excavation. The side wall sample PID readings ranged from non-detected to 7 ppmv Total Organic Vapors (TOV) by volume, but the headspace reading for the base of excavation sample was 250 ppmv. Because the soil headspace from the base of the excavation exceeded the MCP notification criteria of 100 ppmv, VERTEX notified MassDEP of the release on May 30, 1997. MassDEP subsequently assigned RTN 3-15149 to the gasoline release and provided verbal approval for an “Assessment only” Immediate Response Action (IRA) which consisted of collecting soil samples to assess the nature and extent of the release. The “Assessment only” IRA was conducted due to the presence of underground utilities (including high pressure steam pipes) which were located near and adjacent to the excavation.

Vertex collected soil confirmation samples, and the excavation was lined with polyethylene sheeting and backfilled to grade with soil. Six soil confirmation samples were submitted for laboratory analysis for gasoline-related VOCs [i.e., benzene, toluene, ethylbenzene, and xylenes (BTEX) and MTBE] and two soil samples were submitted for TPH analysis. Detected concentrations of toluene, ethylbenzene, total xylenes, MTBE, and TPH did not exceed their corresponding MCP Method 1 S-1/GW-2 standards. Vertex completed the RAO statement on June 30, 1997 and concluded that, based upon these laboratory results, further remedial actions were not necessary and that a condition of “no significant risk” was present at the Site. Closure for this release is categorized as a Class B-1 RAO which indicates that no remedial work was necessary to achieve a level of “no significant risk.”

### **5.2.5 RTN 3-0015442, Power Plant, 200 Trapelo Road**

File information for this RTN obtained during the MassDEP file review and a website search is provided in Exhibit C-5. This release has a current status of Class A-2 RAO.

According to the RAO Statement completed by Corporate Environmental Advisors (CEA) on October 24, 1997, a release of approximately 100 gallons of No. 6 fuel oil occurred at the Power Plant on August 19, 1997, during a routine fuel delivery. The fill line on an oil delivery truck became disconnected from the UST fill port, and the oil was released to an asphalt and concrete driveway surface. Approximately 50 gallons of oil flowed down the concrete retaining wall adjacent to the driveway to the dry stream bed. T.S. Truck Service notified MassDEP within the required two-hour notification period.

MassDEP personnel subsequently granted verbal IRA approval to the response contractor to apply absorbents to the driveway and other impacted surfaces as well as boom in the dry stream bed in an effort to contain the release. The MassDEP representative also granted verbal IRA approval for pumping of pooled oil from the stream bed and excavation of up to 5 cubic yards of impacted soil from the stream. A post-excavation composite soil sample for EPH analysis was collected from the dry stream bed on August 20, 1997. Approximately 6 weeks later, a background soil sample was collected from an upgradient location in the stream and submitted for EPH analysis. The concentrations of EPH aliphatic and aromatic hydrocarbon fractions were below the most conservative MCP Method 1 soil standards; additionally, further excavation in the stream to reduce concentrations to background was determined to be infeasible due to the inaccessible location and presence of boulders in the stream bed.

Based on detected EPH constituents in a soil sample collected on August 20, 1997 from a “parting” within the impacted stained driveway area, CEA subsequently completed a subsurface soil assessment beneath the concrete and asphalt driveway area where cracks and breaches were observed. Three soil borings were advanced through the driveway surface and soil samples were collected from 6 inches to 1 foot bgs and submitted for EPH analysis. Although EPH aliphatic and aromatic hydrocarbon fractions were below the applicable MCP Method 1 standards, the concentrations of four PAH compounds exceeded the Method 1 standard. These PAH compounds included benzo(a)anthracene, dibenzo(a,h)anthracene, benzo(b)fluoranthene, and benzo(a)pyrene. As a result, in October 1997, CEA excavated approximately 10 cubic yards of soil from beneath the impacted driveway area to a depth of approximately 3 feet below grade. Three additional composite soil samples were collected for EPH analysis from the extent of the excavation; PAH concentrations for the same four compounds remained above the Method 1 standards in only one of the soil samples. Based on an interview with facility personnel, CEA attributed the elevated residual PAH concentrations to a historical release in the vicinity of the driveway. CEA removed the stockpiled and drummed remediation waste from the Site and completed an MCP Method 2 Risk Assessment to “close” the Site with a Class A-2 RAO. A Class A-2 RAO indicates that a permanent solution has been achieved but that contaminant concentrations have not been reduced to background (i.e., non-detect).

### **5.2.6 RTN 3-0010725, Fernald School**

File information for this RTN obtained during the MassDEP file review and a website search is provided in Exhibit C-10. This release has a current status of Class A-2 RAO.

According to the RAO Statement completed by Vertex on June 21, 2000, MassDEP was notified on March 22, 1994 of a threat of a release following tank tightness testing of two, 4,000-gallon gasoline USTs located in a paved area on the east side of the Farm and Grounds building. The tanks were used to store gasoline used to refuel FDC vehicles; the tanks were connected to a gasoline pump in this location. MassDEP subsequently assigned RTN 3-0010725 to this location.

As part of the initial site investigation, the tanks were uncovered and faulty check valves and venting systems were repaired on each tank. The tanks were subsequently tested and "confirmed tight." Nevertheless, MassDEP ordered further subsurface investigation. Soil and groundwater levels of gasoline-related contaminants exceeded applicable MCP Method 1 standards. Web Engineering Associates, Inc. (WEB) submitted the IRA and Phase I Completion reports to MassDEP in June 1995, and WEB classified the disposal site as a Tier II site.

The two gasoline USTs, the associated pumping system, and impacted soil were subsequently removed as part of a RAM conducted by Vertex in 1997. Confirmation soil samples were collected from each of the tank graves, and laboratory results indicated that gasoline contamination had been reduced to below MCP Method 1 S-1/GW-2 and S-1/GW-3 standards. Under subsequent RAM assessment activities, downgradient soil borings were completed as monitoring wells, and additional soil and groundwater samples collected from these downgradient locations. Because gasoline related compounds were detected in groundwater within the former UST excavation, and a soil sample from a boring beyond the limits of the excavation exceeded applicable MCP Method 1 standards, additional remedial excavation was completed in March 2000. Subsequent soil and groundwater analyses indicated that remaining concentrations of gasoline-related compounds in these media were below the applicable MCP Method 1 standards; as such, Vertex submitted an RAO statement for a Class A-2 RAO for the site in June 2000.

### **5.2.7 RTN 3-0015121, Fernald School**

File information for this RTN obtained during the MassDEP file review and a website search is provided in Exhibit C-12. This release has a current status of Class A-2 RAO.

According to an RAO Statement prepared by Vertex dated June 30, 1997, MassDEP assigned RTN 3-0015121 to a gasoline release from the damaged fuel tank of a passenger van owned by the Massachusetts Department of Mental Retardation (MDMR) on May 20, 1997. The van driver backed up into a broken light stanchion which resulted in a punctured gasoline tank. Unaware of the leak, the driver proceeded over paved roadways throughout the FDC campus, making stops at two additional locations. Because the capacity of the gas tank was 35 gallons and the exact amount of fuel present in the gas tank was not known prior to the incident, the estimate of 35 gallons is considered an upper limit; the total amount of gasoline released was estimated at less than 35 gallons.

The areas which were impacted and the estimated volume of gasoline released at these locations included (1) approximately 3 to 4 gallons of gasoline to the paved and grassy area around the point of contact with the light stanchion near the "Fernald Workshops" (presumed to be Site 7) (2) approximately 5 to 10 gallons of gasoline onto the pavement in the parking lot of the Shriver Center, (3) approximately 10 to 12 gallons of gasoline impacting a puddle in the paved parking area at the on-campus bottle Redemption Center (which was located at East/Dowling Hall at that time), and (4) an undetermined amount of gasoline along the roadways between the three locations. The report noted that some residual gasoline at the Shriver Center was washed across the parking lot onto soils near a dumpster.

MassDEP provided verbal approval for an IRA on the day of the incident. Response actions conducted by the response contractor included the use of absorbent materials to collect gasoline on paved areas and collection of gasoline impacted rainwater in a puddle using a vacuum truck. Vertex subsequently collected shallow soil samples from two unpaved locations, and submitted the samples to a laboratory for TPH and VOC analysis (for BTEX and MTBE only). Since soil sample concentrations did not exceed the applicable Method 1 S-1/GW-2 cleanup standard, Vertex concluded that response actions resulted in the removal of the source and that a condition of "no significant risk" existed at the Site. Because contamination remained above background levels in soil areas impacted by the release, a Class A-2 RAO was achieved at the Site.

As part of this ESA, TechLaw verified with Mr. Paul Bermingham that the Release Locations depicted on Figure 2 of the Vertex report were not entirely correct. The building noted by Vertex to be the Redemption Center is actually Hillside, the former Superintendent's residence. TechLaw manually corrected Figure 2 of the Vertex report to correctly indicate the location of the Redemption Center, which at the time was located in the East/Dowling Hall.

### **5.2.8 RTN 3-0021892, Malone Park Bldg. No. 21**

File information for this RTN obtained during the MassDEP file review and a website search is provided in Exhibit C-6. This release has a current status of Class A-2 RAO.

According to the RAO Statement completed by Coneco on June 27, 2003, a release of an unknown quantity of No. 2 fuel oil was discovered during closure of a 500-gallon No. 2 fuel UST located on the south side of Malone Park Building No. 21 (ICF 23) on June 26, 2002. Upon removal, the tank was inspected and no holes were observed in the tank shell. Because the PID readings for the soil jar headspace samples collected from the UST excavation exceeded 100 parts ppmv, MassDEP was notified within the required 72-hour time period, assigned RTN 3-0021892 to the release, and provided verbal approval for IRA activities.

This "disposal site" is located in the area of the former UST along the south wall of Malone Park Building No. 21. Following the detection of elevated PID headspace readings and observation of a light sheen on groundwater within the UST excavation, Coneco used PID headspace readings to determine the endpoint of the UST excavation. The final excavation dimensions were 15 feet by 15 feet to a depth of 7 feet. Five composite soil confirmation samples were collected for EPH from the excavation sidewalls and base; no EPH petroleum hydrocarbon fractions and PAH



target compounds were detected in any of the confirmation samples. Petroleum-impacted soil was stockpiled and subsequently removed from the site.

In January 2003, three test borings were advanced to depths ranging from 6 to 14 feet bgs to assess for the presence of downgradient petroleum impacts, and the borings were completed as monitoring wells. Two soil and three groundwater samples collected in January 2003 were submitted for EPH analysis. EPH petroleum hydrocarbon fractions and target analytes were not detected in either soil sample and in two of the three groundwater samples, but low levels of EPH petroleum hydrocarbon fractions were detected in groundwater collected from the well installed in the backfilled UST excavation. A second round of groundwater samples was collected for EPH in June 2003; no detectable levels of EPH petroleum hydrocarbon fractions and target analytes were reported by the laboratory. A Method 1 Risk Characterization was completed, and soil and groundwater EPH EPCs were below the applicable Method 1 standards. Additionally, Coneco concluded that no uncontrolled sources of contamination remained at this site and no additional response actions were necessary. The Method 1 Risk Characterization indicated that a permanent solution was achieved, resulting in a condition of "no significant risk" at the disposal site for all current and future activities and uses. Therefore, conditions meeting the criteria of a Class A-2 RAO were achieved.

#### **5.2.9 RTN 3-0021893, Malone Park Bldg. No. 23**

File information for this RTN obtained during the MassDEP file review and a website search is provided in Exhibit C-8. This release has a current status of Class A-2 RAO.

According to an IRA Status Report completed by Coneco on February 26, 2004, a release of an unknown quantity of No. 2 fuel oil was discovered during closure of a 500-gallon No. 2 fuel UST located on the west side of Malone Park Building No. 23 on June 26, 2002. Upon removal, the tank was inspected and no holes were observed in the tank shell. Because the PID readings for the soil jar headspace samples collected from the UST excavation exceeded 100 parts ppmv, MassDEP was notified within the required 72-hour time period, assigned RTN 3-0021893 to the release, and provided verbal approval for IRA activities.

The disposal site is located in the area of the former UST between the west wall of Malone Park Building No. 23 (ICF 23) and a stone retaining wall further to the west of the former UST area. Coneco detected elevated PID headspace readings and observed a light sheen on groundwater within the UST excavation. In July 2002, soil was excavated from the former UST location. The final excavation dimensions were 20 feet by 20 feet to a depth of 11 feet. Five composite soil confirmation samples were collected for EPH from the excavation sidewalls and base; no EPH petroleum hydrocarbon fractions and PAH target compounds were detected in any of the confirmation samples above applicable Method 1 standards. Petroleum-impacted soil was stockpiled and subsequently removed from the site.

As part of a supplemental subsurface investigation begun in January 2003 and completed in June 2003, three test borings were advanced to depths ranging from 11 to 13 feet bgs to assess for the presence of downgradient petroleum impacts. Three borings were completed as monitoring wells. Two soil and three groundwater samples were submitted for EPH analysis. Low

concentrations of EPH petroleum hydrocarbon fractions and PAH target analytes were detected in soil sample B-2, and soil sample B-3 was non-detected for all EPH petroleum hydrocarbon fractions and PAH target compounds. However, concentrations of EPH petroleum hydrocarbon fractions and the PAH target compound phenanthrene exceeded applicable Method 1 GW-2 and/or GW-3 standards for the groundwater collected from monitoring well CMW-1 installed in the backfilled UST excavation. Only one EPH aliphatic fraction exceeded the Method 1 GW-2 standard for groundwater collected from monitoring well CMW-2 which is located approximately 20 feet from the southeast corner of the final UST excavation. Because a condition of "no significant risk" was not present in groundwater at the site, further soil excavation was completed in September 2003. Further, in order to meet MCP deadlines, Coneco submitted a Phase I Initial Site Investigation and Tier II Classification submittal for the disposal site in July 2003; TechLaw did not review the MCP Phase I report because the IRA Status Report summarizes findings which were included in the Phase I report.

Remedial activities resulted in reduced EPH concentrations in groundwater. Three additional rounds of groundwater samples were collected for EPH analysis in November 2003, December 2003, and February 2004. The IRA Status Report specified that at least four additional rounds of groundwater samples would be collected from the Site.

According to the Site Information presented on the MassDEP website, the IRA Completion report and RAO Statement were received by MassDEP on August 4, 2005. A Class A-2 RAO was achieved at the site, which indicates that a permanent solution was achieved but that contamination was not reduced to background.

### **5.2.1 RTN 3-0021380, Thom Building**

File information for this RTN obtained during the MassDEP file review and a website search is provided in Exhibit C-11. This release has a current status of Class A-1 RAO.

According to an IRA Completion and RAO Statement prepared by Coneco on July 9, 2002, 12 gallons of diesel fuel were released by a malfunctioning supply pump inside the basement of the generator room in the Thom Building on January 7, 2002. Diesel fuel flowed across the concrete slab floor and underneath the door outside the building, impacting an approximately 50 square foot area of soil and asphalt pavement.

MassDEP was notified within two hours of facility personnel obtaining knowledge of the release, and assigned RTN 3-0021380 to the release. IRA activities included the application of absorbent materials to the release area and drumming of spent absorbent and liquids; collection of five surficial soil samples for EPH analysis from the impacted soil on the north side of Thom Building; hand excavation of surficial soils located adjacent to the generator room to a depth of approximately 14 inches (resulting in the excavation and removal of 0.65 cubic yards of contaminated soil); and collection of post-excavation soil confirmation samples for EPH analysis. No petroleum hydrocarbon fractions were detected in the post-excavation soil confirmation samples. Coneco concluded that since no uncontrolled sources of contamination remained, additional response actions were not necessary. Coneco also concluded that remedial

actions reduced contaminant levels to background; therefore, a condition of “no significant risk” for current and future uses existed at the site; therefore a permanent solution was achieved which meets the criteria of a Class A-1 RAO.

### **5.3 Activity and Use Limitations**

An AUL was implemented for a 0.4-acre parcel impacted by No. 6 fuel oil from the former USTs at the Power Plant. The AUL was implemented in association with the Class A-3 RAO for the Power Plant under RTN 3-0013467 which restricts land uses in the vicinity of the Power Plant located on the southern portion on the Property. TechLaw notes that the EDR Environmental Lien Report did not identify any AULs recorded for 200 Trapelo Road.

### **5.4 Physical Setting Sources**

Information regarding the physical setting of the Property was obtained from the MassGIS website, a site visit, and topographic maps.

#### **5.4.1 Topography**

The USGS Boston North Quadrangle 7.5 minute series topographic map was reviewed for this ESA and is included as the Site Locus Plan (Figure 1). Property elevations range from approximately 50 feet above MSL in the wetland area southwest of the FDC’s Waverley Oaks entrance driveway to approximately 240 feet above MSL near the peak of Owl Hill, located on the eastern portion of the Property. Areas to the southwest and southeast are at lower elevations than the Property elevations in general. Clematis Brook is not on the Property, but flows from the northwest to the southeast just south of the Property and ultimately discharges into Beaver Brook. Beaver Brook flows generally from north to south beyond the eastern perimeter of the Property beyond Waverley Oaks Road. Slopes across the Property are gentle closest to Trapelo Road but steepen further to the south on the Property.

#### **5.4.2 Soils/Geology**

According to the MassGIS Bedrock Lithology map for the Property (Figure 5), bedrock consists of mafic rocks and granite. TechLaw observed numerous bedrock outcrops across the Property during the site inspection.

According to the MassGIS Surficial Geology map (Figure 6), nearly all of the Property consists of till or bedrock with a minor component of sand and gravel deposits in the vicinity of the wetland on the southern corner of the Property.

#### **5.4.3 Hydrology**

Site Hydrographic Features are presented on Figure 4. Groundwater in the vicinity of the Property flows in a generally southerly direction toward the Charles River which is located between 1.0 and 1.5 miles south of the Property. However, actual groundwater flow direction on the Property varies based on land topography, and could flow in directions other than to the south, depending on localized features.

Groundwater in the vicinity of the Property is not used for potable water purposes as Waltham's water supply is provided by the MWRA whose source is the Quabbin Reservoir. Depth to groundwater on the Property varies based on elevation, local topographic gradients, and proximity to water bodies. A wetland area occupies the southern corner of the Property and the nearest surface water in the vicinity of the Property is Clematis Brook which follows the southwestern property line beyond the Property and discharges into Beaver Brook, a tributary of the Charles River.

#### **5.4.4 Flood Zone Information**

A review of the MassGIS FEMA Flood Zone map (Figure 8) indicates that the yellow area surrounding the wetland on the southern corner of the Property is mapped as flood zone X500. The on-site wetland is within Flood Zone AE, the area of a 100-year flood zone.

#### **5.4.5 Oil and Gas Exploration**

No oil or gas wells were observed on the Property or depicted on the USGS Topographic Map.

### **5.5 Historical Use Information on the Property**

The Property was used for agricultural and residential uses prior to its development as a school for developmentally delayed patients. TechLaw reviewed available standard historical resources to obtain information on past uses and development of the Property and surrounding parcels.

#### **5.5.1 Aerial Photographs**

TechLaw obtained aerial photographs for the Property vicinity from EDR and reviewed available aerial photographs dated 1938, 1955, 1960, 1978, 1980, 1987, 1995, and 2006. A copy of the EDR Aerial Photo Decade Package is included in Exhibit B-1 of this report. The photographs are summarized below:

**Date:** December 1938

**Description:** The 1938 aerial photograph shows the Property with numerous buildings to the south and primarily agricultural fields along Trapelo Road to the north (except for the residences present on the south side of Trapelo Road). Areas to the north of Trapelo Road include agricultural fields and residential neighborhoods. The area to the west, south, and east of the Property is mostly wooded terrain. Waverley Oaks Road is present on the southeastern corner of the photograph and the Pierce Brothers greenhouse complex is visible east of Waverley Oaks Road.

**Date:** December 1955

**Description:** The 1955 aerial photograph shows the Property with few notable changes since the 1938 photograph except for the addition of the Greene Unit on the western portion of the Property. Significant changes in surrounding

properties include the oval-shaped Murphy Army Hospital complex (northwest of the Property); a building of the Massachusetts Metropolitan State Hospital (north of the Property), further development of residential neighborhoods (north and east of the Property); tank farms with large ASTs (southeast of the Property beyond Waverley Oaks Road). The photograph shows containers (possibly ASTs) and a lagoon at the rear portion of the Pierce Brothers greenhouse complex located southeast of Waverley Oaks Road. This complex is shown immediately north of a winding stream and north of railroad tracks.

**Date:** May 1960

**Description:** The 1960 aerial photograph shows the Property in much the same configuration as in 1955. The resolution of the photograph is poor, making it difficult to observe any changes since 1955.

**Date:** April 1978

**Description:** The 1978 aerial photograph shows changes on the Property including the addition of a portion of the Cottage Complex (on the northwest side of the Property) and the Shriver Center (located near the Trapelo Road entrance to the Property). Off-site changes include the development of the residential neighborhoods between the east side of the Property and Waverley Oaks Road; replacement of the Pierce Brothers greenhouse complex with an office building, and construction of the Federal Records Center Archives building adjacent to the northwest Property boundary (formerly a baseball field on the Murphy Army Hospital grounds in a prior photograph). The wetland area west of Waverley Oaks Road is deeply furrowed, possibly due to the fly ash experiment that was being conducted on that parcel in 1978.

**Date:** October 1980

**Description:** The 1980 aerial photograph shows the Property in the same configuration as in 1978. The only significant change noted on nearby parcels is the addition of a second office building to the former Pierce Brothers greenhouse property (by that time owned by Duffy Brothers Construction).

**Date:** April 1987

**Description:** The 1987 aerial photograph shows the Property as previously shown. Although the photographic resolution is poor, it is possible to see that Malone Park has, at least in part, been developed or been cleared for construction of the four residential buildings. No other significant changes are noted to the Property or nearby properties.

**Date:** March 1995

**Description:** The 1995 aerial photograph shows the Property as it currently exists. The only significant changes noted to surrounding properties since 1987 includes the redevelopment of the tank farm on the southeast side of Waverley Oaks Road (the tanks having been removed and only the tank footprints visible) and additional office buildings across from the FDC Waverley Oaks entrance.

**Date:** 2006

**Description:** The 2006 aerial photograph shows the majority of the Property except for the Malone Park Drive residences on the southwestern portion of the Property. No significant changes are noted on the Property, and the former Murphy Army Hospital area (partially visible) has begun to be redeveloped with athletic fields.

No on-site RECs are evident on the Property. Off-site RECs or historical RECs include the area southeast of Waverley Oaks Road formerly utilized by Pierce Brothers (later purchased by Duffy Construction) which was impacted by waste oil and PCBs, the area southeast of Waverley Oaks Road formerly occupied by the Shell Products Distribution tank farm, and the fly-ash impacted wetland south of the Property.

### **5.5.2 Fire Insurance Maps**

Sanborn Fire Insurance Maps (Sanborn Maps) dated 1897, 1903, 1911, 1918, 1950 and 1972 were available for review, and were provided by EDR/Sanborn. Adjacent parcels were not depicted on most of the Sanborn Maps. Copies of the Sanborn Maps are included in Exhibit B-2.

**Date:** 1897

**Description:** Two campus areas are depicted on the Sanborn Map. The E-shaped West Building (having dormitory wings, a kitchen, a dining room, day rooms, and a school room) is depicted adjacent to and northeast of a small building with three “heaters” and an attached coal shed (presumed to be Belmont House), and south of a building identified as North West Building (presumed to be MacDougall Hall). These buildings are noted as located one-half mile west of “Main Building” and that fire hydrants shown on the Sanborn Map were connected to the Waltham Water Works.

The remaining portion of the campus appears to be the old “quad” area. Fire hydrants around the buildings are connected by an 8-inch diameter water pipe connected to the Waltham Water Works. Fire hoses are noted for each of the major campus buildings. The northernmost building is identified as the North Building, and a Boy’s Dormitory (in the location of the Old Activities Center) is shown approximately 125 feet south of the North Building. The Administration Building (Waverley Hall) is southwest of the Boy’s Dormitory and the Schoolhouse (with a gymnasium and school building) is south-southeast of the Boy’s Dormitory. Further south of the Boy’s Dormitory is the Girl’s Dormitory

(Chipman Hall). A building with a laundry, boilers, and attached coal shed (the Store Room) is shown approximately 125 feet south of the Administration Building. Four smaller buildings are present further to the south including a hospital and what appears to be a carpenter shop with small detached shed and a “fumigating house.” TechLaw notes that these three of these four buildings no longer exist, although it appears that the “hospital” may be located at the same location as Stephen Bowen Hall. Text notes that “heat and power” are generated by steam.

**Date:** 1903

**Description:** The 1903 Sanborn Map shows that most of the structures had not significantly changed since 1897. Changes noted on the Sanborn Map include a northern addition to the Administration Building (Waverley Hall), a small addition to the laundry building (Store Room), and a southerly addition to the hospital (Stephen Bowen Hall)

**Date:** 1911

**Description:** The 1911 Sanborn Map shows two additional unidentified buildings on the western portion of the FDC campus north of MacDougall Hall which includes West Nurses and Dolan Hall. By 1911, an addition was constructed on the northwest side of MacDougall Hall and to the south side of Belmont House. Although not specifically named, six new structures were also added to the eastern portion of the FDC campus including North Nurses, Withington Building, East Nurses, Manual Training, Warren Hall, and South Nurses. An addition was also constructed onto the Store Room.

**Date:** 1918

**Description:** The 1918 Sanborn Map depicts a consolidated view of the FDC campus along with driveways. The only change to the western portion of the campus is the addition of a “pipe subway” that originates at the Boiler House (Belmont House), proceeds to the West Building, then connecting beyond with North West Building (MacDougall Hall) through two pipe subways and beyond that by one pipe subway to the N. North West Building (Dolan Hall). West Nurses does not appear to be connected to the pipe subway in this map.

The southwest corner of the Property is shown on the 1918 Sanborn Map depicts a cow barn and silo approximately 300 feet south of West Building and the Boiler House. Smaller structures south of the cow barn include a tool house, a long wagon shed, a two-story stable, and a one-story shed. An irregularly-shaped farmhouse with small building (presumed to be a shed) are located approximately 250 feet southeast of the cow barn, and two small structures connected by a structure (such as a porch or awning) and labeled “Men’s Home” is located approximately 200 feet northeast of the farmhouse.

By 1918, all but one of the major buildings on the eastern portion of the campus were connected by a pipe subway system which originated from

the Boiler and Laundry Building (Store Room). New buildings on the eastern side of the campus included an infirmary (Lavers Hall) and a recreation building (Southard Laboratory). A 35,000-gallon stand pipe was also visible on the hill east of the Manual Training building. Warren Hall and Chipman Hall were identified as girls' dormitories and Withington Building and the Old Activity Center were identified as boys' dormitories.

By 1918, two new structures had appeared on the FDC campus between the west and east campuses: East Dormitory (East/Dowling Hall) and the Superintendent's residence (Hillside). East Dormitory is shown having a heater room with two boilers; these two structures were not shown to be connected with any of the pipe subways.

Offsite buildings along Waverley Oaks Road included small residences, and the Pierce Brothers greenhouse complex to the southeast. In 1918, there were two entrances to the FDC from Waverley Oaks Road. Trapelo Road is not shown on the 1918 Sanborn Map.

**Date:** 1950

**Description:** Changes since the 1918 Sanborn Map include construction of the existing Administration Building; Assembly Hall (Howe Hall); Service Building (Old Service Building); a new laundry building (Laundry/Therapeutic Equipment Center); Tarbell Hall (designated as an employees building); Seguin Hall (an infirmary); the Maintenance Building; the Power Plant; the greenhouse, four small cottages (Cottages 17 through 20); a men's infirmary in the Wallace Building; a small storehouse; the garage; and Wheatley Hall (designated as a nursery). Other changes include additions onto North Nurses Home and the Old Service Building (which was shown to be used for storage), a transformer house between the garage and Stephen Bowen Hall. The transformer appears to be in the location of the former sterilizing building (fumigating building). By 1950, Waverley Hall was shown to be a dormitory. Medical and dental labs were shown in the Southard Laboratory building. Off-site properties do not appear to have changed significantly since 1918.

**Date:** 1972

**Description:** The 1972 Sanborn Map shows the addition of the Chapel, Thom Building (designated as a hospital), Building 55 (designated as a transformer yard); and Kelley Hall (designated as a boy's home and dormitory). The cow barn was no longer present, having been replaced by a small shed. Additions were made to East Dormitory (East/Dowling Hall) and the Old Service Building. Off-site properties do not appear to have changed significantly since 1950, although more residences are present on either side of Waverley Oaks Road than in 1950. One of the buildings in the former farmhouse area was identified as a "slaughter house."

Potential use of hazardous materials or petroleum as identified in the Sanborn Map review include the probable presence of asbestos in the "pipe subway" system, Power



Plant, and buildings with boilers (East Dormitory a.k.a. East/Dowling Hall, the Store Room, Belmont House); PCBs in transformer areas (Buildings 14 and 55); coal and/or petroleum storage (Power Plant, Belmont House); laboratory chemicals (including mercury) in Southard Laboratory which was used for dental and medical research purposes; herbicides, fungicides, and pesticides (Greenhouse); bactericides (in medical facilities and the sterilizing house); petroleum (Power Plant); and oils and solvents (Garage) and Maintenance workshops.

### 5.5.3 City Directories

TechLaw obtained a City Directory abstract from EDR to review historical uses of the Property. City directory abstracts were reviewed in five-year increments between 1970 and 2005. A copy of the EDR City Directory Abstract is included in Exhibit B-3. Environmentally significant occupants of the Property included the Shriver Center (medical research facility), various clinics, and Tufts Dental. These types of facilities generate small quantities of medical-related hazardous wastes.

### 5.5.4 Historical Topographic Maps

TechLaw obtained historical USGS topographic maps from EDR. Copies of the historical topographic maps are included in Exhibit B-4 and discussed below:

**Date:** 1903

**Description:** Some development is suggested on the southern portion of the Property between Cedar Hill and Owl Hill. A stream and wetland area is located on the western portion of the Property.

**Date:** 1947

**Description:** Buildings and roadways are present on the Property (which is shown as the Fernald State School), on the west side of Owl Hill. Clematis Brook is shown flowing beyond the southern portion of the Property, and an unnamed stream and pond on the Property discharge into Clematis Brook. Beaver Brook flows along the northern side of the Boston and Maine Railroad line southeast of the Property. The Metropolitan State Hospital complex is located north of the Property a considerable distance beyond Trapelo Road. Other than residential development in the immediate vicinity of the Property, no other changes have been observed since the 1903 topographic map. The Pierce Brothers greenhouse complex appears southeast of Waverley Oaks Road.

**Date:** 1950

**Description:** One substantial change noted since the 1947 topographic map is the development of the Murphy General Hospital Complex west of the Property.

**Date:** 1956

**Description:** Changes to the Property since the 1950 topographic map includes the addition of the Greene Unit on the western portion of the Property. The railroad siding which enters the Property from the southeast is visible on the topographic map. The initial development of the Shell Oil Distribution facility is noted by the two tanks (black circles) on the map south of Waverley Oaks Road. The water tower that serves the Property is located on the hilltop north of Trapelo Road, and a building of the Metropolitan State Hospital is located along the road to the water tower.

**Date:** 1971

**Description:** By 1971, the topographic map includes the Murphy Federal Archives building northwest of the Property, and additional large ASTs on the Shell Products Distribution center south of the Property and Waverley Oaks Road.

**Date:** 1985

**Description:** Changes to the Property include construction of a portion of the Cottage Complex on the northwest side of the Property and the construction of Malone Park Road. The only significant change to nearby properties is the construction of a long office building south of Waverley Oaks Road where the Pierce Brothers greenhouses were previously located.

Off-site RECs observed from the review of the USGS topographic maps include the Shell Distribution Center tank farm and Pierce Brother greenhouses southeast of Waverley Oaks Road.

## **5.5.5 Additional Historical Record Sources**

TechLaw reviewed several documents as part of this ESA to obtain historical use information and ascertain whether past operations on the Property indicated the potential presence of RECs. These historical records include two documents reviewed at the Archive Room of the Waltham Public Library, and the Wikipedia entry for the Fernald School. Historical information relevant to the development and historical use of the Property is summarized below.

### **5.5.5.1 National Register of Historic Places Registration Form and Attachments**

On August 31, 1992, Preservation Consultant Candace Jenkins prepared a Registration Form including the final draft of a report to place the Walter E. Fernald State School on the National Register of Historic Places. A copy of the report is included in Exhibit B-6. The report provides information on the history of the FDC and includes building construction and use information as well as activities which occurred on the Property. Dates of construction for the buildings on the Property and their historical usage are incorporated into Table 5-5 which included as an attachment at the end of this report.

According to the Jenkins report, the Massachusetts School for Feeble Minded Children was originally founded in South Boston in 1848. By 1887, the school had outgrown its

physical facility in South Boston, and the Massachusetts State Legislature purchased farm land in rural Waltham from the Bird, Baldwin, Lawrence, and Warren families. In 1888, the legislature appropriated funding to construct buildings for the School for Feeble Minded Children in Waltham. In 1888, an existing stone farmhouse was renovated to house an “advance team” of up to 30 boys who, along with the resident farmer and his family, dug drains and made roads for the new school. By 1890, the Asylum Building (now the West Building) was completed in the southwestern corner of the campus and included steam heat and incandescent electric lights from the original power plant (now the Belmont House).

Between March 1890 and December 1891, patients from South Boston were transferred to the new Waltham facility. Several major buildings that comprise the campus core area were subsequently completed between 1891 and 1914. Tufts Dental clinic was established on campus 1917, and research involving x-ray examination of the brain began in the 1920s. During the 1920s, staff residences and Southard Research Laboratory were constructed. By 1925, the Massachusetts School for the Feeble Minded was renamed the Walter E. Fernald State School, one year after the death FDC’s first resident superintendent. A third wave of construction was completed during the 1930s. Major post-war expansion of the campus occurred during the 1950s through the 1970s with construction of many of the more modern structures. Additional housing clusters were constructed on the northwest (Cottages 3-13) and southwest (Malone Park) sides of the Property from the mid-1970s through the late 1980. The FDC was added to the National Register of Historic Places in 1994. TechLaw notes that the newest campus building, Pearlman, was not mentioned in the Jenkins report; this facility operates as the "new food service building" and was likely completed in 1992.

#### **5.5.5.2 History of the Walter E. Fernald State School**

TechLaw reviewed Dr. Anna M. Wallace’s *History of the Walter E. Fernald State School* which was dated 1941. This history was used as a source of information for the Jenkins report, and was available for review at the Waltham Public Library. In addition to information provided in section 5.5.5.1, the Wallace history stated that a sewer connection to the Waltham Division of Metropolitan Sewerage System was completed in 1894.

#### **5.5.5.3 Wikipedia Summary**

TechLaw also obtained information from a Wikipedia posting for the Fernald School, which is included in Exhibit B-7. Of potential environmental interest, Wikipedia cited that, during the period of 1946 through 1953, 57 boys were fed oatmeal laced with radioactive calcium and iron. The experiments on FDC children were conducted by Harvard University and the Massachusetts Institute of Technology (MIT) researchers, presumably to determine the effect of radiation on body systems. Radiation levels were measured in the boys’ blood and stool samples. Wikipedia suggests that the radiation doses were relatively low. No further information was obtained which confirmed the location where radioactive chemicals may have been stored or analyzed on the Property;

however, suspected storage locations for the radioactive materials include the Southard Laboratory and Lavers Hall which served as the infirmary at the time of the testing.

#### **5.5.5.4 EDR Environmental Lien Report**

At TechLaw's request, EDR conducted an environmental lien search for the Property. The EDR Environmental Lien Report (Lien Report) is included in Exhibit B-5. The Lien Report does not indicate that any environmental liens have been recorded for 200 Trapelo Road. The Lien Report included a copy of a 1931 deed related to 200 Trapelo Road recorded at the MCRD in Book 5600 and Page 550 along with a Plan of Land. The deed was executed to convey a 1.5-acre parcel from the City of Waltham (located behind the Phineas Lawrence School) to the Walter E. Fernald State School (owned by the Commonwealth of Massachusetts). TechLaw notes that the Plan of Land, dated December 1929, identifies owner of the parcel to the west of the Phineas Lawrence School as the Roman Catholic Archbishop of Boston; this church-owned parcel is currently part of the Subject Property parcel (APN R036 008 0001). The parcel east of the Phineas Lawrence School (part of APN R045 001 0001) was identified as formerly owned by the Heirs of James F. Baldwin.

#### **5.5.6 Prior Assessment Reports**

Mr. Paul Bermingham, Director of Campus Safety, provided TechLaw with a copy of the Spill Prevention, Control, and Countermeasure (SPCC) Plan for the FDC which was prepared by FS Engineers, Inc. and finalized in March 2005. A copy of the SPCC plan is included in Exhibit D-1, and listed the locations of petroleum filled USTs, ASTs, and transformers on the Property. The Facility Site Plan shows the locations of these containers. Each numbered container is listed either on SPCC Table 1 (for Total Petroleum Product Bulk Storage) or SPCC Table 2 (Total Petroleum Product Bulk Storage FDC Transformers).

The SPCC plan appears to be outdated based on the following discrepancies:

- Table 1 indicates that 3 USTs (2U to 4U) are present at the Power Plant. According to Power Plant personnel, these three USTs were removed and replaced by two 20,000-gallon USTs approximately 15 years ago. Waltham Fire Department records indicate that the three old USTs were removed in 1996.
- *Section 3.2 Spill Control* states that Thom Building has a double-walled, 275-gallon diesel AST outside the building; however, TechLaw observed that the AST outside the Thom Building is a propane AST. The 275-gallon AST may remain inside the Thom Building.
- *Section 3.2.2 Non-Bulk Storage Control* indicates that "all transformers have been retrofitted with non-PCB containing transformer oil; however, PCB warning signs are posted on the chain link fencing around Building 55's transformer area and at least one transformer inside the fenced compound.

- *Section 6.0 Site Security* indicates that gasoline tanks at the “Grounds Department” (presumed to be Farm and Grounds Department) are equipped with overfill detection and prevention features; however, other records indicate that the two gasoline USTs were removed in 1997 along with the fuel pump.

TechLaw notes that reports submitted to MassDEP related to response actions conducted on the Property are discussed in a prior section of this report.

## 5.6 Historical Use Information on Adjoining Properties

By review of the standard historical sources referenced above, the historical uses of the adjoining properties are summarized below:

**Northeast:** Prior to the current use of properties to the northeast as residences, a vacant state dormitory, undeveloped land, and an elementary school, the land was rural farmland. The state-owned building at 475 Trapelo Road was closed in 1992 and was part of the Metropolitan State Hospital; it housed a treatment center for insane children and was built some time between 1938 and 1955. The Phineas Lawrence public school has occupied its parcel since at least the 1930s. Construction of the off-site residences along Trapelo Road occurred between the 1930s and the 1960s.

**Southeast:** Prior to the current use of the properties to the southeast as residences and office buildings, the majority of the land consisted of undeveloped woodland or residences. Most of the land southeast of the Property was owned by the Pierce family and, by the 1920s, the Pierce Greenhouse complex occupied the land southeast of Waverley Oaks Road. The residential neighborhoods east of the Property were built on land originally owned by the Pierce family; houses in this area were constructed between the 1930s and late 1970s. The Pierce Brothers Greenhouses were demolished sometime between the 1960s and 1978, by which time a long office building was constructed by Duffy Brothers Construction, Inc. on the parcel located at 411 Waverley Oaks Road. By 1955, large gasoline and oil ASTs occupied the parcel across the road from the FDC’s Waverley Oaks entrance; this was, in later years, referred to as the former Shell Product Distribution Plant. The tanks were removed between 1987 and 1995, and office buildings replaced the tank farm between the 1990s and 2006. Due to the storage and use of waste oil on the Duffy Brothers parcel, response actions are continuing under the MCP.

**Southwest:** Prior to the current use as an agricultural experiment station and a Girl Scout camp, the property parcels to the southwest were farmland or undeveloped. The Girl Scouts acquired the land for the camp in 1923. The wetland area southwest of the Property parcel had an old calf barn, silos, ice house, and farmhouse and was acquired by the State of Massachusetts (date not determined) and used as part of an agricultural experiment station. The wetland parcel is currently an active

MassDEP release site. Fly ash was applied to the wetland as part of an experiment conducted by EPA, MassDEP, and the City of Waltham in 1978.

**Northwest:** Prior to the current use as college campus, a municipal park, and F.C. Murphy Record Center, the property to the northwest was undeveloped land. The Murphy General Hospital (originally an Army hospital) was constructed between 1938 and 1946. It closed in 1958. The buildings remained occupied until the mid-to late 1990s when much of the land was acquired by Bentley College (for use as dormitories) and the City of Waltham (as recreation fields and for a new high school). The F.C. Murphy Federal Records Center was built some time between 1956 and 1971.

Off-site historical RECs include the former Shell Product Distribution Plant at 313 Waverley Oaks Road. Active off-site RECs include the Duffy Brothers Construction property (a.k.a. Duffy Brothers Construction, Inc.) at 411 Waverley Oaks Road; the UMASS parcel occupied by the fly-ash impacted wetlands at 225-227 Beaver Street; and the area south of the boiler room at the Former Heating Plant at 333 Forest Street.

## **6.0 SITE RECONNAISSANCE**

### **6.1 Methodology and Limiting Conditions**

The site reconnaissance for the Property was completed by Gretchen Fodor on June 30, July 1, and July 13, 2009. Mr. Paul Bermingham, Director of Campus Safety, provided access to and accompanied Ms. Fodor through the Property. Paul Bermingham has worked at FDC for approximately 31 years. TechLaw notes that the work scope for this ESA did not include accessing building interiors, presumably because they have been accessed by other DCAM contractors as part of a building assessment survey. As such, TechLaw's observations are limited to exterior areas of the Property.

Limiting conditions specifically pertaining to this ESA include:

- Only exterior environmental conditions were surveyed as since building interiors were not accessed (due to work scope limitations);
- Municipal file review information was very limited because the City of Waltham does not have jurisdiction over state property, except for certain functions (such as Fire Department records where the Waltham Fire Department provides response services);
- Although most exterior areas of the Property were observed by foot and vehicle, steep hillside grades, densely vegetated woodlands, and wetlands are present near most of the Property lines. Therefore, not all areas on the 195-acre Property were accessible for viewing.
- Observations made by TechLaw were typically based on an inspection of each building's perimeter, where it was possible to do so. Notable exceptions to the building perimeter inspection included the Maintenance complex and Farm and Grounds Department where dense woodland and excessive shrubbery made it impossible to observe all side of the buildings; and
- Many building perimeters, particularly for unsafe and/or condemned buildings which are fenced off and locked due to safety concerns, are heavily covered with vegetation (e.g., landscaping, vines, brush, trees, and poison ivy). As a result, not all features of potential concern (such as UST fill and vent pipes) may have been identified on the Property.

RECs identified as part of this ESA are based on observed exterior environmental conditions and/or information provided by a review of historical files.

### **6.2 General Site Setting**

The Property is comprised of an irregularly-shaped parcel approximately 195 acres in size and was designed as a full service campus for serving the needs of developmentally delayed children and adults. Currently, the Property is developed with approximately 71 buildings, not including sheds. The structures were constructed between the mid-1800s and 1993, and construction building materials vary depending on the function of the structure and date of construction. Many of the FDC's older institutional structures are primarily constructed of brick and mortar and have gable

rooflines, while newer residential structures have manufactured siding on exterior walls and flat roofs. Many buildings have been or are being vacated as part of the closure of the FDC.

Most administrative and functional buildings are centrally located on the Property while perimeter areas tend to be residential. The physical plant area located on the southernmost portion of the Property includes the Power Plant, workshops at the Maintenance building, the Farm and Grounds Department, and the Main Transformer and is accessed from Waverley Oaks Road. The Property buildings are connected by asphalt and concrete paved private roads, driveways, and parking lots. The main entrance to the FDC is from Trapelo Road north of the Property. The service entrance to the FDC is from Waverley Oaks Road, located on the southeast side of the Property.

Electricity to the Property is provided by NSTAR. The main water and sewer lines serving most of the FDC buildings connect with Property water and sewer mains at the southern portion of the Property. Water and sewer are provided to the Property by the Massachusetts Water Resources Authority (MWRA). TechLaw notes that the former residential buildings on the Property on Trapelo Road are connected to the Waltham water distribution and sewer collection systems. The MWRA also provides the City of Waltham with water and sewer service. The Power Plant, located near the southwestern property line, supplies steam heat to the majority of the campus on a year round basis. The Power Plant uses No. 6 fuel oil to generate steam. Buildings that are not on the underground steam distribution system use No. 2 fuel oil, natural gas, or propane for heat. A system of catch basins and drainage swales discharge storm water that collects on the Property toward retention basins, Clematis Brook, or the wetland area near the Power Plant. A small unnamed brook has remnants on the Property, and flows past the Power Plant and discharges to the wetland area.

## **6.3 Environmental Conditions**

As part of TechLaw's site inspection, environmental conditions were observed at the Property to assess whether potential RECs are present. The Property was evaluated for potential RECs related to the following environmental conditions:

### **6.3.1 Solid Waste Disposal**

According to Paul Bermingham, Waste Management, Inc. (WMI) collects solid waste on the Property daily from dumpsters located near Property buildings. No obvious indication of hazardous waste disposal was observed in the dumpster areas.

### **6.3.2 Surface Water Drainage**

Storm water flows directly into swales or is collected by catch basins in paved areas and diverted to drainage swales and ultimately flows into wetlands, nearby ponds, detention basins, or streams. A small unnamed stream once flowed from the northwest portion of the Property to the southeast portion of the Property; a segment of this stream remains west of the Power Plant and was observed during the site reconnaissance to be running clear, without evidence of sheens. Paul Bermingham was not aware if catch basins on the Property were equipped with oil/water separators or whether any storm water treatment units were present on the Property.



### **6.3.3 Wells and Cisterns**

TechLaw observed no potable or irrigation wells or cisterns on the Property. One stick-up monitoring well and several flush mounted monitoring wells observed in the vicinity of the Malone Park residential complex (Buildings ICF 21 and ICF 23). TechLaw did not observe any of the monitoring wells located in the paved parking area adjacent to the Farm and Grounds Department; these wells had been installed when the gasoline USTs were removed from the area and may have been paved over after MCP response actions were completed. Several downgradient monitoring wells are also present on the hillside south of the Power Plant USTs, and monitoring wells may remain inside the Power Plant but were not viewed as part of this ESA.

### **6.3.4 Wastewater**

No indications of industrial wastewater disposal or treatment facilities were observed during the onsite reconnaissance. Paul Bermingham indicated that all sanitary discharges on the Property are diverted to the MWRA collection system, and he was not aware of any buildings which may have septic systems. He stated that sewage from FDC buildings flows by gravity through the FDC sewer mains down to the MWRA sewer connection near the Farm and Grounds Department. TechLaw notes that for the old Trapelo Road residences which are part of the FDC complex (at 180, 282, and 338 Trapelo Road), the City of Waltham Engineering Department confirmed that they had inactive water and sewer connections. TechLaw did not observe evidence of any septic vent pipes on the Property.

### **6.3.5 Additional Site Observations**

TechLaw observed a marker post for an oil pipeline operated by Exxon on the north side of Malone Park Drive, west of the Greene Unit and east of ICF 24. TechLaw contacted Mr. Allen Wiggin (DCAM) for additional information on the pipeline. Mr. Wiggin provided information related to a 30-foot wide easement which runs through the western and southern portions of the Property. These documents are included in Exhibit D-2. The easement was originally granted to Colonial Beacon Oil Company during the mid-1940s by the Commonwealth of Massachusetts for installation of two pipelines (4 inches and 6 inches in diameter) “for the conveyance of petroleum and the products or by-products thereof...” Exxon Mobil Corporation subsequently acquired the easement. Exhibit A of the *Commonwealth License to Occupy State-Owned Real Property* (License Agreement) indicates that the pipeline enters the western portion of the Property from Trapelo Road and travels south-southwest, crosses Malone Park Drive, then continues south-southwest into the Girl Scout Camp property, and then turns southeast where it intersects Waverley Oaks Road. The Lease Agreement is for use of the pipeline easement for conveyance of fiber optic cables. TechLaw was informed that the pipeline was abandoned. Exhibit A specifies that Segments 2, 3, 4 and 6 are located on FDC property. Two plans depict a portion of the easement locations on the Property. One plan incorrectly depicts the pipeline segment location near Wheatley Hall (which is actually Seguin Hall) and the southern property line. “Pierce Brothers” and “Shell Oil Co.” are noted on the southeast side of Waverley Oaks Road. The other mapped segment shows the pipeline easement on the east side of the pond on the Girl Scout camp property. Based upon the pipeline’s projected age (perhaps up to 65

years old) and the unknown condition of the pipeline, TechLaw considers the presence of the pipeline on the Property to be a REC.

TechLaw also noted areas with discarded debris on the Property. Building materials, hoses, a ladder, and tires were present in a pile on the north side of the Farm and Grounds Building. A discarded AST and tires were present adjacent to the waste oil berm in front of the Garage.

### **6.3.6 Hazardous Materials and Petroleum Products Used or Stored at the Site**

The Shriver Center was identified on the EDR report as a RCRA SQG which generates small quantities of hazardous waste. TechLaw notes that although Tufts Dental operates on the Property (currently in the Withington Building) and hospitals, clinics, or infirmaries have operated or continue to operate on the Property (in the Thom Building), these entities do not appear as generators of hazardous waste on the database report. No evidence of the use of hazardous materials or storage areas for hazardous wastes was observed on exterior portions of the Property during TechLaw's site reconnaissance. However, TechLaw would expect that the past or present use of x-ray photographic developing equipment would generate silver-bearing and photographic waste streams and medical waste streams as part of routine clinic operations. TechLaw would, therefore, expect that these clinics could potentially be listed as RCRA generators.

Hazardous materials used for heating purposes include propane and natural gas. Propane is stored in a large tank behind the Farm and Grounds Department building and is used to heat the building. A couple of small propane tanks were observed adjacent to the Steam Plant boiler room, and are reportedly used to light the boiler pilot lights in the event of a power outage. Gas grill sized propane tanks were observed in some areas of the Property. Natural gas heat is piped to the following FDC buildings: the Day Care Center at 338 Trapelo Road, Cottages 19 and 20, and Hillside.

With the exception of used motor oil, petroleum products used or stored on the Property are for consumptive use. Paul Birmingham stated that used motor oil is shipped off-site for disposal by a contractor, and that the FDC sends its vehicles off-site for repair. Petroleum products used and stored at the Property include No. 6 fuel oil, No. 2 fuel oil, diesel fuel, and waste oil. General storage locations include:

- No. 2 and No. 6 fuel oil are stored in USTs or ASTs in various locations on the Property for use in oil-fired boilers which provide heat to campus buildings. High-pressure steam is generated using No. 6 fuel oil by the Power Plant, and subsequently distributed to heat the majority of campus buildings. No. 2 fuel oil is stored in USTs at Site 5, Site 7, and the new Activity Center which are all in the northwestern corner of the Property near the Cottage Complex. TechLaw notes that high pressure steam is converted to hot water and the forced hot water is piped underground to heat Cottages 3 through 13, Woodside, and Brookside. No. 2 fuel oil is stored in ASTs and used for heating the following buildings: ICF 21 through ICF 24, the Day Care at 180 Trapelo Road, the former Volunteer Center (282 Trapelo Road), and Cottages 17 and 18.
- Diesel fuel used to power an electrical generator is stored in a UST at the Shriver Center and in ASTs at the Thom Building, Howe Hall, Farrell Hall, Greene Unit,

Wallace Building, Seguin Hall, Cottage 11, and the Pearlman Building. The vent and fill pipes for a second diesel AST inside Farrell Hall (identified as “A16” on the SPCC Facility Site Plan) were not found during TechLaw’s site reconnaissance; exterior walls of the building were noted to be heavily covered with vines and vegetation, possibly obscuring the fill and vent piping for this AST. TechLaw notes that diesel fuel is also stored in three 55-gallon drums in the Farm and Grounds Department building for use as a fuel for tractors and other heavy machinery used on site. A 275-gallon AST present inside this building was empty; based on Table 1 of the SPCC Plan, it may have been used for storage of diesel fuel in the past, although on-site grounds staff indicated that it previously stored No. 2 fuel oil (for heating the building).

- Used motor oil is stored in two 275-gallon ASTs and two 55-gallon drums within a secondary containment structure at the FDC Garage.

### **6.3.7 Unlabeled Containers and Drums**

TechLaw did not have access into site buildings. However labeled drums of diesel fuel were observed through the open door inside the Farm and Grounds Department building. Except for the drums of waste oil in the secondary containment shed outside the Garage, drum storage areas were not observed outside of FDC buildings.

TechLaw observed a rusted out 55-gallon drum within the fenced enclosure outside of Waverley Hall and a discarded, rusty 55-gallon drum behind the Garage. No other unlabeled containers or drums were observed during the site reconnaissance.

### **6.3.8 Disposal Locations of Regulated/ Hazardous Waste**

The Shriver Center is operated as part of the University of Massachusetts Medical Center independently of FDC and is a RCRA SQG. No disposal information was available for review for the Shriver Center other than the EDR report.

According to Paul Bermingham, waste oil collected at the Garage is disposed off-site by a licensed disposal company. No other obvious indications of hazardous waste generation, storage, or disposal were observed on the Property or were indicated during interviews.

TechLaw notes that the on-site medical and dental facilities may generate small quantities of hazardous waste as part of these services. These waste streams may include medical waste, x-ray photographic processing wastes containing silver, and mercury-bearing wastes from amalgam used in dental care. Other than the Shriver Center, the EDR report did not list any other RCRA generators operating on the Property.

TechLaw noted that several discarded computer monitors and other solid waste were outside the Volunteer Center building at 282 Trapelo Road. If broken, computer monitors can release hazardous materials (i.e., heavy metals such lead) into soil. Other solid waste disposal areas observed during the site reconnaissance included the hillside area behind the Garage where tires, automotive parts, and other debris was discarded. TechLaw considers these discarded materials to be a de minimis condition.

### 6.3.9 Evidence of Releases

No obvious indication of hazardous material or petroleum product releases, such as stained areas or stressed vegetation, was observed outside Property buildings during the site reconnaissance. Paul Bermingham indicated that an incident occurred at FDC many years ago involving a drum that was illegally dumped on the Property by someone from off site; this information was confirmed in a spill listing involving a drum in the EDR report.

### 6.3.10 Polychlorinated Biphenyls (PCBs)

Older transformers and other electrical equipment could contain polychlorinated biphenyls (PCBs) at a level that subjects them to regulation by the U.S. EPA. PCBs in electrical equipment are controlled by U.S. EPA regulations 40 CFR, Part 761. Under the regulations, there are three categories into which electrical equipment can be classified:

- Less than 50 parts per million (ppm) of PCBs – *“Non-PCB” transformer*
- 50 ppm - 500 ppm – *“PCB-Contaminated” electrical equipment*
- Greater than 500 ppm – *“PCB” transformer*

TechLaw observed nearly all of the pole-mounted or pad-mounted oil-filled transformers at the locations noted on the FDC SPCC Facility Site Plan. Access was not provided to transformers or other electrical equipment located inside Transformer vaults/buildings (such as in Building 14) or within fenced enclosures (Building 55). Transformers associated with Kelley Hall (T82-T86) were not observed, and may be located either inside the building or may have been removed after the building was closed and boarded up. The transformer location adjacent to the Chapel (T2) is actually located on a utility pole on the southeast side of the Chapel rather than the northeast side as shown on the SPCC Facility Site Plan. TechLaw also did not observe the pole-mounted transformed closest to Cottage 18 (T7) due to excessive vegetation; it may be located in the densely wooded area between Cottages 18 and 20. Access was also not provided into the high voltage switchgear enclosure northwest of the Power Plant and north of Chapel Street which is identified by a sign as “NSTAR STA436.” TechLaw presumes that the equipment within this enclosure is owned and operated by NSTAR.

TechLaw observed that most of the transformers on the Property were labeled with “Non-PCB” labels adhered to the exterior of the transformer. Paul Bermingham stated that most of the transformers on the Property are state owned, and that historically when transformers on the Property leaked, they were repaired or replaced in order to phase out use of PCB transformers on the Property.

Signage indicating the presence of PCBs was noted in the following locations: Exterior transformers in the Building 55 fenced enclosure. Other areas not accessed as part of this assessment but potentially containing PCB oils includes the electrical vault inside the Thom Building (in the room beneath the rear loading dock) and in the switchgear and/or electrical vaults inside the Power Plant. Old electrical equipment containing PCB oil may be used if the equipment is operating properly without leakage. PCBs present in electrical

equipment on the Property are considered a de minimis condition since none of the containers appeared to be leaking.

### 6.3.11 Landfills

No evidence of on-site landfills was observed or reported during the site reconnaissance, and no evidence of historic landfills on the Property was revealed by the file review.

### 6.3.12 Pits, Ponds, Lagoons, Sumps, and Catch Basins

TechLaw observed a detention pond north of the Cottage Complex located on the northern corner of the Property. A low-lying wetland is located on the northwest side of the Pearlman building; no standing water was observed in this wetland although wetland vegetation was observed present and the wetland area was surrounded by chain-link fencing. The Site Orthographic Photo (Figure 3) and the FDC Site Plan (Figure 3) also show that a portion of the wetland along the south-southwestern side of the Property encroaches onto the southernmost portion of the Property. In addition, a natural pond is located on the Girl Scout property parcel adjacent to the Property; storm water runoff in this portion of the Property flows toward the pond on the Girl Scout property.

No evidence of on-site pits or lagoons was observed or reported during the site reconnaissance. Catch basins on the Property are used to drain storm water from roadways and parking lots. No sumps were observed as part of this assessment. Catch basins and ponds on the Property are not considered an environmental concern.

### 6.3.13 On-Site ASTs and USTs

TechLaw observed evidence of ASTs and USTs in use at the Property during the Site reconnaissance. Tank information provided in the tables below was obtained from the SPCC Plan. Sizes and construction of tanks located underground or inside buildings could not be verified. Dates of installation could not be confirmed since Fire Department records were not sufficiently detailed to confirm installation dates. The presence of fill and vent pipes was used as an indicator that tanks listed in the SPCC plan remained on site. TechLaw was not able to verify that following ASTs on the Property.

**Table 6-1**  
**ASTs Not Confirmed Present at Fernald Developmental Center**

SPCC Tank #	Location	In (I) or Out (O)	Type	Volume (gals)	Product	Installed	Use
16A	Farrell Hall north wing	I	Steel	30	Diesel	1980	Generator
17A	Cottage 17	I	Steel	275	No. 2 fuel	1975	Heat
18A	Cottage 18	I	Steel	275	No. 2 fuel	1975	Heat

I – Inside building  
O – Outside building

**Table 6-2**  
**USTs and ASTs Confirmed Present at Fernald Developmental Center**

SPCC Tank #	Location	In (I) or Out (O)	Type	Volume (gals)	Product	Installed	Use
<b>USTs</b>							
1U	Shriver Center	O	Steel	750	Diesel	1970	Generator
2U*	Power Plant	O	UNK	2 x 20,000	No. 6 oil	c. 1996	Heat
6U	Site 5	O	Fiberglass	10,000	No. 2 oil	1984	Heat
5U	Site 7	O	Fiberglass	10,000	No. 2 oil	1984	Heat
7U	Training/Activities Center	O	Fiberglass	4,000	No. 2 oil	1981	Heat
<b>ASTs</b>							
NA	Power Plant	O	Steel	UNK	Propane	UNK	Pilot light
NA	Thom Bldg	O	Steel	UNK	Propane	UNK	Generator
1A	Thom Bldg	I	Steel	275	Diesel	1999-2001	Not used
2A	Howe Hall	I	Steel	275	Diesel	1999-2001	Generator
3A	Farrell Hall	O	Steel	1,000	Diesel	1999-2001	Generator
4A	Greene Unit	O	Steel	275	Diesel	1999-2001	Generator
5A	ICF 21	O	Steel	330	No. 2 oil	1999-2001	Heat
6A	ICF 22	O	Steel	330	No. 2 oil	1999-2001	Heat
7A	ICF 23	O	Steel	330	No. 2 oil	1999-2001	Heat
8A	ICF 24	O	Steel	330	No. 2 oil	1999-2001	Heat
9A	Farm & Grounds	I	Steel	275	Empty	1975	Not used
10A	Day Care (180 Trapelo Rd)	I	Steel	275	No. 2 oil	1975	Heat
11A	Volunteer Center (282 Trapelo Rd)	I	Steel	2 x 275	No. 2 oil	1975	Heat
12A	Wallace Bldg	O	Steel	100	Diesel	1984	Generator
13A	Seguin Hall	O	Steel	100	Diesel	1984	Generator
14A	Cottage 11	O	Steel	85	Diesel	1995	Generator
15A	Pearlman	I	Steel	5,000	Diesel	1992	Generator
19A	Garage	O	Steel	2 x 275	Lube oil	1980	Disposal

\* - Tank location for new USTs is the same as for removed USTs 2U, 3U, and 4U

I – Inside building

ICF – Intermediate Care Facility

NA – Not applicable

O – Outside building

UNK - Unknown

TechLaw notes that current Power Plant personnel stated that the three tanks referenced in the SPCC Plan were removed and replaced about 15 years ago with two 20,000-gallon double walled USTs. The tank sensors which monitor product levels and interstitial space between tanks are reported to no longer work properly. Tank product levels are measured by stick.

Based on the absence of visible fill and vent piping on the outside of the buildings, TechLaw was not able to confirm that the following ASTs listed in the SPCC plan remain on the Property:

The 750-gallon UST at the Shriver Center was installed in 1970. Based upon its age and steel construction, it is likely that the tank shell has been weakened over its 39-year lifetime. TechLaw considers this tank, which the SPCC plan notes as having no corrosion protection or secondary containment, to be an REC.

ASTs located the two former residential buildings at 180 and 282 Trapelo Road and the ASTs that may remain in Cottages 17 and 18 were installed during the 1970s. The condition and amount of oil present in the tanks is unknown, and the unoccupied buildings were observed to be in poor condition. These ASTs are considered an REC based upon their age and the condition of the buildings.

#### **6.3.14 Radiological Hazards**

Radiological equipment is reported to be in use in the Shriver Center, and is also presumed to be used for dental x-rays by Tufts Dental which is currently located in the Withington Building. Other x-ray equipment may currently be present or have historically been present in buildings used as medical facilities (most notably the Thom Building). Historical information indicates that x-ray equipment was first used at the Property in the 1920s.

TechLaw notes that during the 1940s and early 1950s, Harvard and MIT researchers dosed oatmeal with radioactive isotopes of calcium and iron that was fed to a select population of FDC boys as part of an experiment on human health effects of radiation exposure. Blood and stool samples were collected for radioactive analysis. Although no documentation was obtained during the historical file review for this ESA, TechLaw suspects that medical buildings present at that time or the Southard Laboratory could have been used to store radioactive chemicals and/or conduct the analyses. According to Paul Bermingham, the Southard Laboratory was the original FDC medical lab where autopsies and medical research on the brain was conducted. In addition, Sanborn Maps identify a dental lab at Southard Laboratory.

Since the Property buildings were connected to the municipal sewer in the years prior to the oatmeal experiment and no information was obtained indicating that a release of radioactive materials has impacted the Property, radioactive contamination is not likely a current environmental concern in exterior portions of the Property.

#### **6.3.15 Drinking Water**

The Property is connected to the MWRA water supply which receives its water supply from the Quabbin Reservoir in central Massachusetts. No potable wells are known to be present

on the Property, and drinking water wells are not present within a one-mile radius of the surrounding Property. Water sampling was not conducted at the site to verify water quality. Drinking water quality is not an environmental concern.

#### **6.3.16 Asbestos**

Asbestos is not typically evaluated as part of an ASTM scope of work unless specifically required. However, the MCP is developing regulations for asbestos in soil, and since damaged material was observed that is exposed to weather, TechLaw is noting it herein.

TechLaw observed thermal system insulation (TSI) that is presumed to contain asbestos in the form of pipe wrap on various locations of the Property. Asbestos is likely to be present and has the potential to be released to air, soil, and water. As shown on historical Sanborn Maps, steam pipe tunnels are located throughout the Property and transport steam to most of the Property buildings. Redevelopment of the property would require removal of steam piping between buildings; this process would require asbestos abatement prior to removal.

TechLaw observed TSI in fair to poor condition which is exposed to ambient conditions in several locations on the Property:

- Generator vent piping on the northeast side of Howe Hall,
- Steam pipe in a venting structure adjacent to the Store Room, and
- Piping on underside of overhead metal decking outside the northwest wall of the Power Plant between the smokestack and UST location.

The poor condition of the TSI coupled with erosion due to wind and rain would disperse asbestos. TechLaw considers that TSI in poor condition and subject to dispersion by weather to be a REC. TechLaw also notes that asbestos siding is present on the former Volunteer Center (282 Trapelo Road) and the former Day Care (180 Trapelo Road).



## **7.0 INTERVIEWS**

### **7.1 Interviews with Owner**

The Commonwealth of Massachusetts owns the Property. Mr. Paul Bermingham, FDC Director of Safety, was assigned as the primary point of contact for the operations at FDC, and was interviewed by TechLaw as part of this ESA. Mr. Bermingham escorted TechLaw through the Property and answered questions. Information obtained from Mr. Bermingham has been incorporated into Section 6 of this report.

### **7.2 Interviews with Local Governmental Officials**

On June 3, 2009, TechLaw contacted MassDEP to schedule a file review for the purpose of obtaining information regarding historic and current RECs on the Property. TechLaw conducted the file review at the MassDEP Northeast Regional Office (NERO) on June 11, 2009, and subsequently reviewed pertinent files related to the Property. On July 24, 2009, TechLaw obtained information from Mr. Ethan Gould (MassDEP NERO) and Mr. Chris Coolen (MassDEP NERO) related to on-site and off-site RTNs. These records are included in Appendix C and the information is incorporated into Section 5.2.

On June 4, 2009, TechLaw contacted the Waltham Fire Department by telephone in order to inquire about UST and ASTs located on the Property. On June 5, 2009, TechLaw visited the Waltham Fire Department and submitted a “21E” request form for the Property. TechLaw received a response from the Waltham Fire Department on July 23, 2009 (see Exhibit C-14). This information is incorporated into Section 5.1.

On June 8 and June 11, 2009, TechLaw visited the archivist at the Waltham Public Library to obtain information regarding the historical use of the Property. TechLaw reviewed and collected documents pertaining to the history of FDC. This file material is included in Exhibit B-6 and the information is incorporated into Section 5.5.

During the course of this ESA, TechLaw obtained zoning information for the Property from the Town of Waltham GIS website which indicated that the Property is zoned for “Conservation/Recreation” use. TechLaw also obtained a detailed site plan of the Property from Mr. Eric Rizzo of the City of Waltham MIS Department. TechLaw has identified the Property buildings on the site plan provided by Mr. Rizzo for the ESA.

On June 8, 2009, TechLaw visited the City of Waltham Public Health Department to obtain documents relating to potential RECs at the Property. These records are located in Exhibit C-14 and the information is incorporated into Section 5.1.

On June 8 and July 13, 2009, TechLaw visited the City of Waltham Assessors Department and Engineering Department to obtain information pertaining to the Property. These records are included in Exhibit C-14.

## **8.0 FINDINGS AND OPINION**

TechLaw has identified known or suspected environmental conditions associated with the Property or nearby Properties. These environmental conditions include RECs, historical RECs, and/or de minimis conditions.

### **8.1 On-Site RECs**

An oil pipeline easement traverses the western and southern portions of the Property. Two oil pipes were installed in the easement during the mid-1940s by Colonial Beacon Oil Company. The pipeline was subsequently acquired by Exxon Mobil Corporation. The oil pipeline was reportedly abandoned, and a lease agreement was executed for use of the easement for conveyance of fiber optic cables. The oil pipeline is considered an REC considering its age (approximately 65 years old) and absence of information regarding its subsurface condition and integrity.

Thermal pipe insulation was observed on steam pipes and other piping that is exposed to weather on the Property. Because of its presumed age, the thermal pipe insulation likely contains asbestos, and was observed to be in fair to poor condition. Exposed thermal insulation was observed in three locations including (1) on steam pipes in an open venting structure adjacent to the Store Room, (2) pipes on the underside of an open metal deck outside the northwest wall of the Power Plant, and (3) on a generator exhaust pipe located on the northeast wall of Howe Hall. Asbestos siding is also noted present on the former Volunteer Center (282 Trapelo Road) and the former Day Care (180 Trapelo Road).

The 750-gallon diesel UST at the Shriver Center was installed in 1970. Based upon its age and steel construction, it is probable that the tank has been weakened since it was installed. The tank was not equipped with corrosion protection or secondary containment. This UST is considered an REC based upon its age and absence of corrosion protection.

Petroleum-contaminated soil is present in the vicinity of the Power Plant on the Property resulting from historical releases of No. 6 fuel oil. An AUL has been implemented for an approximately 0.4-acre parcel which is partially located under the Power Plant's building footprint and partially south of the Power Plant. Under a potential redevelopment scenario involving demolition of the Power Plant, petroleum-contaminated soil could become exposed. The MA RELEASE is related to two linked RTNs. RTN 3-0010367, the "parent" RTN, is listed with a status of "Class C RAO" and is linked with "daughter" RTN 3-0013467, which is listed with a status of a "Class A-3 RAO."

ASTs located the two former residential buildings at 180 and 282 Trapelo Road and the ASTs that may remain in Cottages 17 and 18 were installed during the 1970s. The condition and amount of oil present in the tanks is unknown, and the unoccupied buildings were observed to be

in poor condition. These ASTs are considered an REC based upon their age and the condition of the buildings.

## 8.2 Off-Site RECs

Two off-site RECs were identified which have potential to impact the Property, based on their proximity and/or upgradient location relative to the Property.

The **Waltham Federal Center** "disposal site" at 424 Trapelo Road is located adjacent to the northwest side of the Property. A "separate phase oil" plume is present on a portion of the adjacent parcel, and the release listed under two apparently linked RTNs (RTN 3-6013 and RTN 3-17581) under the name "Waltham Federal Center." TechLaw reviewed a site plan presented which shows the approximate extent of "separate phase oil" which was released from the former USTs at the boiler plant at that site. The leading edge of the separate phase oil plume is shown to be within 25 feet of the Subject Property and appears to be progressing down the hillside slope toward the Subject Property. Based on this information, TechLaw considers this release an off-site REC that has potential to impact the Subject Property. The current status of the "disposal site" is listed as Class C RAO which indicates that a temporary solution has been achieved but response actions have not yet achieved a condition of "no significant risk." The Malone Park Drive residences (ICF 21- ICF 24) are located downgradient of the advancing plume.

The **UMASS** parcel at 225-227 Beaver Street is located adjacent to the southern portion of the Property and is identified as a MA RELEASE disposal site under RTN 3-28049. The parcel is owned by the Commonwealth of Massachusetts and occupied by UMASS Amherst Agricultural School. The parcel was contaminated with cadmium, chromium, and lead at levels exceeding MCP Reportable Concentrations. The wetlands on the UMASS parcel was used in 1978 as part of the Phoenix Project, and contaminated by application of fly-ash residue containing heavy metals. Negotiations are currently on-going to determine whether an AUL could be applied to the "disposal site" in lieu of excavation of the wetland area as part of site closure under the MCP. At the time of the writing of this report, TechLaw was unable to obtain information on the exact location and boundary of the wetland test parcel, and extent of contamination. Since the wetland on the Subject Property and the wetland that the UMASS parcel occupies are contiguous, it is possible that heavy metals could have been transported by wind or water and deposited on the Subject Property.

## 8.3 Previously Resolved On-Site RECs

Based on the results of this assessment, eight historical RECs for the Property are currently not considered an environmental concern. The eight reported MA RELEASES for the Property have been assessed and remediated under the MCP and have a Class A or Class B RAO status.

Power Plant - RTN 3-0011878 and 3-0015442 (MA RELEASE and SHWS):

These two incidents involved No. 6 fuel oil releases at the Power Plant which were due to overfilling or overflowing of the USTs. Oil impacted the nearby brook and soil, sediment, and

recovered product and oil-impacted debris were removed as part of MCP response actions. The status listed by MassDEP for these releases are a Class A-1 and a Class A-2 RAO, respectively.

Power Plant - RTN 3-0015149 (MA RELEASE and LUST):

During closure of a gasoline UST at the Power Plant, a soil headspace reading exceeded the MCP reporting notification threshold. After the tank and soil was removed from the tank grave, soil confirmation samples were collected and analyzed for gasoline constituents. Since none of the soil concentrations exceeded regulatory standards, and the site was "closed" with a Class B-1 RAO.

Farm and Grounds Department - RTN 3-0010725 (MA RELEASE and LUST):

After gasoline USTs and a gas pump were removed from the Farm and Grounds Department parking lot, gasoline constituents were detected in soil and groundwater above regulatory levels. Response actions were completed, the site was "closed" with a Class A-2 RAO.

Malone Park Residences - RTN 3-0021892 and 3-0021893 (MA RELEASE and LUST):

Fuel oil contaminated soil and/or groundwater were discovered during closure of the USTs located adjacent to Malone Park residences. After response actions were completed, these two sites were "closed" with a Class A-2 RAO.

Thom Building – RTN 3-0021380 (MA RELEASE):

Approximately 12 gallons of diesel fuel were released by a malfunctioning pump associated with a generator in the building, and flowed out the doorway onto the ground. After response actions were completed, the site was "closed" with a Class A-1 RAO.

Various locations at 200 Trapelo Road – RTN 3-0015121 (MA RELEASE and SHWS):

Up to 40 gallons of diesel fuel were released on the FDC campus after a van punctured a fuel tank. Three parking lot locations on the Property were impacted including the Fernald Workshops (Site 7), the Shriver Center, and East/Dowling Hall and well as the roadway between these buildings. After response actions were completed, the site was "closed" with a Class A-1 RAO.

## **8.4 Previously Resolved Off-Site RECs**

Previously resolved off-site RECs were identified for three parcels adjacent to the Property:

Former Shell Product Distribution Plant Oil at 313 Waverley Oaks Road:

Three releases are associated with this location including RTNs 3-0003078, 3-0018952, and 3-0020538. Contaminants of concern included PAH compounds, TPH, and metals due to releases of petroleum at the former tank farm. The site was "closed" with a Class A-3 RAO and implementation of an AUL to contain remaining contaminants.

Former Heating Plant at 333 Forest Street:

Response actions were completed for a release of asbestos and arsenic in soil listed under RTN 3-0022303. The former heating plant was located northwest of the Property and the site was

"closed" with a Class A-3 RAO and implementation of an AUL to contain remaining contaminants.

FC Murphy Federal Center at 424 Trapelo Road:

Response actions were completed for a release of PAHs listed under RTN 3-0018887. The site was "closed" with a Class A-2 RAO.

## **8.5 De Minimis Environmental Conditions**

*De minimis* environmental conditions were identified or suspected in connection with the Property during the course of this assessment and include:

- Discarded computer monitors observed on the ground near the garage at the Volunteer Center.
- Discarded tires and automotive parts observed on the ground behind the FDC Garage and a discarded 275-gallon AST adjacent to the waste oil secondary containment berm in front of the Garage.
- Discarded building materials and debris in front of the Farm and Grounds Department building.
- PCB containing transformers and/or electrical equipment: Signs and labeling indicates that PCBs are present in transformers located in the transformer yard adjacent to Building 15. PCBs may also be present in other inaccessible locations on the Property including Building 14, a transformer building located between the North Building and the old Activities Center, the Main Transformer Pad, and electrical vaults located within various buildings (such as the Power Plant). No stains or leaks were observed from visible transformers in the Building 15 transformer yard and the Main Transformer Pad, but other areas containing electrical equipment was not accessible as part of the ESA. TechLaw notes that old electrical equipment containing PCB oil may be used if the equipment is operating properly without leakage.
- Coal Ash: Coal was historically stored and used to generate steam at the Power Plant and Belmont House. Although coal ash is considered exempt under the MCP, compounds or analytes present in coal ash (such as PAHs and metals) may be present in soil around these buildings. Compounds related to coal ash is exempt from notification to MADEP in accordance with 310 CMR40.0317(9) of the MCP.
- Herbicide and pesticide residues that may be present in the Greenhouse area.

## 9.0 CONCLUSIONS

TechLaw has performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E1527-05 for the Fernald Developmental Center located at 200 Trapelo Road in Waltham, Massachusetts. Any exceptions to or deletions from this practice are described in Section 6.1 of this report. This assessment has revealed no evidence of RECs in connection with the Property, except for the following:

- Soil contaminated with No. 6 fuel oil is present in an AUL area under and south of the Power Plant.
- A 65-year old oil pipeline easement exists on the Property whose condition is unknown.
- Thermal pipe insulation present on pipes in outdoor locations was observed to be in fair to poor condition; asbestos may be present in the pipes and able to be dispersed by wind and water. Asbestos siding is also noted present on the former Volunteer Center (282 Trapelo Road) and the former Day Care (180 Trapelo Road).
- A 39-year old 750-gallon diesel UST located at the Shriver Center is not equipped with corrosion protection and could release diesel fuel into the ground.
- No. 2 fuel oil ASTs located in four vacant residential buildings are at least 30 years old, and the buildings are in poor condition.
- An oil plume appears to be approaching the Property from an upgradient adjacent parcel on the northwest side of the Property.
- The wetland on the southern portion of the Property may have been impacted by heavy metals due to an agricultural experiment on the adjacent parcel.

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VERTEX Engineering Services, Inc., Response Action Outcome (RAO) Statement, Massachusetts Department of Mental Retardation, Walter E. Fernald School-Farm and Grounds, 200 Trapelo Road, Waltham, Massachusetts, RTN 3-10725, June 21, 2000.

VERTEX Engineering Services, Inc., Response Action Outcome (RAO) Statement, Massachusetts Department of Mental Retardation, Walter E. Fernald School-(Immediate Response Action), 200 Trapelo Road, Waltham, Massachusetts, RTN 3-15121, June 30, 1997.

Wiggin, A., Email Correspondence Record with G. Fodor (TechLaw, Inc.), RE: Information on Petroleum Pipeline easement through Fernald Development Center in Waltham, July 10, 2009.

Wikipedia.com, Walter E. Fernald State School, Accessed on July 28, 2009 at  
[http://en.wikipedia.org/wiki/Walter\\_E.\\_Fernald\\_State\\_School/](http://en.wikipedia.org/wiki/Walter_E._Fernald_State_School/)

### **Waltham Municipal Files**

#### **Assessors Department:**

Property Record Card, 190 Trapelo Road, April 28, 1981.  
Property Record Card, 282 Trapelo Road, undated.  
Property Record Card, 338 Trapelo Road, April 28, 1981.  
Historical Ownership Index Cards, various dates.  
Printable Abutter List, July 15, 2009.

#### **Engineering Department:**

Water Connection Card for 282 Trapelo Rd., Service No. 3974, undated.  
Sewer Connection Card for 282 Trapelo Rd., Service No. 5349-S, undated.  
Water Connection Card for 338 Trapelo Rd., Service No. 4515-W.

Waltham Fire Department:

Letter Report, RE: Tanks Installed and Removed, July 16, 2009.

### **Waltham GIS Maps**

Printable Zoning Map, 190 Trapelo Rd, August 1, 2009.  
Printable Zoning Map, 338 Trapelo Rd, August 1, 2009.  
Printable Interactive Map, 190 Trapelo Rd, July 15, 2009.  
Printable Interactive Map, 228 Trapelo Rd, July 15, 2009.  
Printable Parcel Viewer Map, 355 Waverley Oaks Rd, July 24, 2009.  
Printable Parcel Viewer Map, 319 Waverley Oaks Rd, July 24, 2009.  
Printable Parcel Viewer Map, 307 Waverley Oaks Rd, July 24, 2009.  
Printable Parcel Viewer Map, 313 Waverley Oaks Rd, July 24, 2009.  
Printable Parcel Viewer Map, 271 Waverley Oaks Rd, July 24, 2009.  
Printable Parcel Viewer Map, 411 Waverley Oaks Rd, July 24, 2009.  
Printable Parcel Viewer Map, 425 Waverley Oaks Rd, July 24, 2009.  
Printable Parcel Viewer Map, 225 Beaver St, July 24, 2009.  
Printable Parcel Viewer Map, 265 Beaver St, July 24, 2009.  
Printable Parcel Viewer Map, 135 Beaver St, July 24, 2009.  
Printable Parcel Viewer Map, Forest St, July 24, 2009.  
Printable Parcel Viewer Map, 371 Forest St, July 24, 2009.  
Printable Parcel Viewer Map, 333 Forest St, July 24, 2009.  
Printable Parcel Viewer Map, 424 Trapelo Rd, July 24, 2009.  
Printable Parcel Viewer Map, 380 Trapelo Rd, July 24, 2009.  
Printable Parcel Viewer Map, 385 Trapelo Rd, July 24, 2009.  
Printable Parcel Viewer Map, 475 Trapelo Rd, July 24, 2009.  
Printable Parcel Viewer Map, 285 Trapelo Rd, July 24, 2009.  
Printable Parcel Viewer Map, 475 Trapelo Rd, July 24, 2009.  
Printable Parcel Viewer Map, 258 Trapelo Rd, July 24, 2009.

### **MassGIS Datalayers**

- *Assessors Parcels Datalayer. December 2007*
- *Bedrock Lithology Datalayer. January 2004.*
- *Surficial Geology Datalayer. December 2007.*
- *Title 5 Setback Areas Datalayer. January 2009.*
- *Transmission Lines Datalayer. March 2007.*
- *Zoning Datalayer. August 2007.*
- *Hydrography Datalayer. January 2009.*
- *MADEP Bureau of Waste Prevention Regulated Sites Datalayer.*
- *MassDEP Oil and/or Hazardous Material Sites with Activity and Use Limitations (AUL) Datalayer. February 2009.*
- *MassDEP Tier Classified Oil and/or Hazardous Material Sites (MGL c. 21E) Datalayer. February 2009.*
- *Non-Potential Drinking Water Source Areas Datalayer. June 2006.*

## **11.0 CERTIFICATION AND QUALIFICATIONS**

The lead assessor/environmental professional for this Phase I report was Ms. Gretchen Fodor. Ms. Fodor earned a Bachelor of Science degree in Chemistry from St. Lawrence University and a Masters of Science in Environmental Studies from the University of Massachusetts – Lowell. She has over 20 years of experience as an environmental chemist and has completed approximately 200 ASTM Phase I ESAs since 2001. In addition, Ms. Fodor has completed five EPA Targeted Brownfields Site Assessments while working as a contractor to EPA Region I. A copy of Ms. Fodor's resume is included in Appendix 11.

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in 312.10 of 40 CFR 312.

I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed all the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Signature of Lead Assessor/Environmental Professional:

Date: