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Five-Year Review Report

Third Five-Year Review Report

for

Wells G&H Superfund Site

Woburn

Middlesex County, Massachusetts

September 2009

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Superfund Records Center
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BREAK: 8.3
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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym/ Abbreviation	Definition
AOC	Administrative Order on Consent
AMSL	Above Mean Sea Level
ARAR	Applicable or Relevant and Appropriate Requirement
AS	Air Sparging
ATSDR	Agency for Toxic Substances and Disease Registry
AWQC	Ambient Water Quality Criteria
Beatrice	Beatrice Corporation
B&M	Boston and Maine
CAA	Clean Air Act
CATOX	Catalytic Oxidation
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
COPC	Contaminants of Potential Concern
CWA	Clean Water Act
1,1-DCA	1.1-Dichloroethane
1,1-DCE	1.,1-Dichloroethene
1,2-DCE	1,2-Dichloroethene
Determination	MassDEP's Groundwater Use and Value Determination
DEQE	Department of Environmental Quality Engineering (now the MassDEP)
DNAPL	Dense Non-Aqueous Phase Liquid
ECS	Environmental Compliance Services, Incorporated
EO	Executive Order
ESD	Explanation of Significant Difference
EPA	United States Environmental Protection Agency
FID	Flame Ionization Detector
FDDA	Former Drum Disposal Area
FS	Feasibility Study
GAC	Granular Activated Carbon
GeoTrans	GeoTrans, Inc. (consultant to Grace)
gpm	gallons per minute
Grace	W.R. Grace & Co. – Conn

Acronym/ Abbreviation	Definition
HASP	Health and Safety Plan
HBHA	Halls Brook Holding Area
HI	Hazard Index
HPS	Harvard Project Services, LLC (consultant to UniFirst)
HRS	Hazard Ranking System
ISCO	In-Situ Chemical Oxidation
LNAPL	Light Non-Aqueous Phase Liquid
LTM	Long Term Monitoring
MassDEP	Massachusetts Department of Environmental Protection
MBTA	Massachusetts Bay Transportation Authority
MCL	Maximum Contaminant Level
MDC	Metropolitan District Commission
M&E	Metcalf & Eddy, Inc.
MSGRP	Multiple Source Groundwater Response Plan
MWRA	Massachusetts Water Resources Authority
NAPL	Non-Aqueous Phase Liquid
NCP	National Contingency Plan
NEP	New England Plastics Corporation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRWQC	National Recommended Water Quality Criteria
Olympia	Olympia Nominee Trust
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
OU-1	Operable Unit 1 – Wells G&H Source Area Properties
OU-2	Operable Unit 2 – Central Area
OU-3	Operable Unit 3 – Aberjona River Study
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
PID	Photoionization Detector
ppb	parts per billion
ppm(v)	parts per million-volume
PRP	Potentially Responsible Party
RAO	Remedial Action Objectives

Acronym/ Abbreviation	Definition
RETEC	The RETEC Group (consultant to Beatrice at Wildwood)
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RME	Reasonable Maximum Exposure
ROD	Record of Decision
RPM	Remedial Project Manager
Scfm	standard cubic feet per minute
SDWA	Safe Drinking Water Act
SF	Slope Factor
STSC	Superfund Technical Support Center
SVE	Soil Vapor Extraction
SVOC	Semivolatile Organic Compound
TBC	To Be Considered
TCE	Trichloroethene
1,1,1-TCA	1,1,1-Trichloroethane
TRC	TRC Environmental Corporation
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage and Disposal Facility
TTNUS	TetraTech NUS, Inc.
ug/L	Micrograms per liter
UniFirst	UniFirst Corporation
UV/Ox	Ultra-violet/chemical oxidation
VOC	Volatile Organic Compound
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WHP	West Hide Pile
Wildwood	Wildwood Conservation Corporation
Woodard and Curran	Woodard and Curran, Inc. (consultant to NEP)
WRA	Woburn Redevelopment Authority

EXECUTIVE SUMMARY

The Wells G&H Superfund Site (the Site) is a 330-acre Site located in Woburn, Massachusetts (see Figures 1 and 2 provided in Attachment 1). The Site includes the aquifer and land located within the zone of contribution of two former municipal drinking water wells known as Wells G and H, which are located adjacent to the Aberjona River. The boundaries of the Site are Route 128 (Interstate 95) to the north, Route 93 to the east, the Boston and Maine (B&M) Railroad to the west, and Salem and Cedar Streets to the south (see Figure 1 in Attachment 1).

The Site was originally segregated into three operable units, the Source Area (Operable Unit [OU]-1) properties, the Central Area (OU-2), and the Aberjona River Study (OU-3). However, in the Spring of 2002, EPA merged the study of Wells G&H OU-3 (the Aberjona River Study) with Industri-Plex OU-2, and subsequently issued a Record of Decision (ROD) in January 2006 that addressed OU-3. Thus, further evaluation of OU-3, including Five-Year Reviews, will be conducted as part of the Industri-Plex Site.

The OU-1 Source Area properties consist of the W.R. Grace & Company (Grace), UniFirst Corporation (UniFirst), New England Plastics (NEP) Corporation, Wildwood Conservation Corporation (Wildwood), and Olympia Nominee Trust (Olympia), the locations of which are depicted on Figure 2 (provided in Attachment 1). Currently, no remedy decision has been selected for OU-2 (Central Area Aquifer), which is under investigation. Thus, OU-2 is not evaluated as part of this Five-Year Review.

The selected remedy identified in the 1989 ROD for the Source Area (OU-1) properties included the following:

- Treatment of contaminated soil using in-situ volatilization at Wildwood property;
- Excavation and on-site incineration of contaminated soils at Wildwood, Olympia, NEP, and UniFirst;
- Treatment and/or disposal of sludge and debris found at Wildwood property in a manner to be determined during the design phase of the clean-up; and
- Extraction and treatment of contaminated groundwater separately at the five Source Area properties using pre-treatment for metals and an air stripper to remove volatile organic contaminants, or an equally or more effective technology approved by EPA. The extraction systems were to be designed to address the specific bedrock and/or overburden contamination at each Source Area property.

EPA's April 25, 1991 Explanation of Significant Differences (ESD) described three significant changes and one non-significant change from the remedial action to be undertaken at the OU-1 Source Area properties as set forth in the ROD. Those changes were as follows:

Significant Changes

- On-site incineration of soils at the Wildwood, NEP, and Olympia properties was changed to off-site incineration;
- In-situ volatilization would be used on the UniFirst property rather than incineration; and
- A typographical error was corrected resulting in more stringent target clean-up levels for groundwater.

Other Non-Significant Change

- Groundwater extraction systems could be combined for the UniFirst and Grace properties.

The 1991 ESD provided for certain changes to the soil and groundwater remedy, but the overall remedy remained fundamentally the same: incineration and in-situ volatilization of contaminated soils, removal of sludge and debris, and extraction and treatment of groundwater at the source areas.

As required by a Consent Decree entered by the court in 1991, a group of Potentially Responsible Parties (PRPs) agreed to conduct the Remedial Investigation/Feasibility Study (RI/FS) for OU-2 (Central Area). EPA has conducted the RI/FS for OU-3 (the Aberjona River Study). A remedy has not yet been selected for the Central Area (OU-2). The Aberjona River Study (OU-3) was combined with Industri-Plex OU-2. Going forward, response actions for Wells G&H OU-3 will be managed as part of the Industi-Plex Site. A ROD for Industri-Plex OU-2 that includes Wells G&H OU-3 was issued on January 31, 2006. The Five-Year Review for the Industri-Plex Site will determine the protectiveness of the Industri-Plex OU-2 remedy, including Wells G&H OU-3.

This is the third Five-Year Review for the Wells G&H Site. The first Five-Year Review was completed in August 1999 and the second in September 2004. The Five-Year Review is required because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

This Five-Year Review concluded that a protectiveness determination of the Source Area (OU-1) remedy at the Wells G&H Superfund Site can not be made at this time until further information is obtained. Further information will be obtained by taking the following actions: additional data will be collected to evaluate potential vapor intrusion impacts at the existing building on the UniFirst Source Area property; additional data will be collected to evaluate the potential vapor intrusion pathway near the UniFirst, Grace and NEP properties. It is expected that these actions will take approximately 6-12 months to complete at which time a protectiveness determination will be made.

In addition, for the Source Area (OU-1) remedy to be protective in the long term, the following measures should be taken: review of soil contamination issues at UniFirst, collection of

additional data, evaluation and implementation of technical solutions; property-specific institutional controls should be established at each Source Area property to prevent potential exposures to the public until the source control remedy has been completed; additional data collection and/or analysis to diagnose the limited VOC reductions at the Source Area properties, and improve system performance and pace of Site cleanup; additional data collection and/or analysis to determine whether or not sufficient capture has been achieved at UniFirst, Grace and Wildwood properties, and where appropriate take corrective actions to ensure sufficient capture is occurring in the future; assessment of groundwater conditions on NEP property since air sparging/soil vapor extraction (AS/SVE) shutdown, evaluation of the need for further groundwater treatment, and where appropriate consideration of other treatment technologies; additional data collection to evaluate deep bedrock groundwater conditions on the NEP property, and where appropriate evaluation of groundwater remedial technologies; assessment of groundwater conditions south of the Wildwood treatment system, evaluation of the need for further groundwater and soil treatment, and consideration of other treatment technologies as appropriate; evaluation of progress of Olympia's soil removal action and assessment of the need for groundwater cleanup at the conclusion of the removal action; assessment of the extent of soil contamination on Grace property and evaluation of and implementation of response actions as appropriate; prevention of non-ingestion groundwater exposures at each Source Area property through the implementation of property-specific controls until the remedy is complete; assessment of groundwater conditions relative to arsenic and manganese at UniFirst, Grace, Wildwood and Olympia properties and where appropriate revision of cleanup goals; evaluation of risk from exposure to indoor air based on up-to-date data if any of the Source Area properties are developed/redeveloped; and assessment of National Pollutant Discharge Elimination System (NPDES) equivalent discharge standards based upon current Ambient Water Quality Criteria (AWQC) at UniFirst and Grace properties, and revision of discharge limits, as appropriate.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site name ***(from WasteLAN)*****:** Wells G&H Superfund Site		
EPA ID ***(from WasteLAN)*****:** MAD980732168		
Region: 1	**State:** MA	**City/County:** Middlesex
SITE STATUS		
NPL status: ☒ Final ☐ Deleted ☐ Other (specify)		
Remediation status (choose all that apply): ☐ Under Construction ☒ Operating ☐ Complete		
Multiple OUs?* ☒ YES ☐ NO	**Construction completion date:**	
Has site been put into reuse? ☐ YES ☒ NO		
REVIEW STATUS		
Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency		
Author name: Joseph F. LeMay, PE		
Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA Region 1	
Review period:** 10 /11/ 2004 to 9/30/ 2009		
Date of site inspection: June 2009		
Type of review: ☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion		
Review number: ☐ 1 (first) ☐ 2 (second) ☒ 3 (third) ☐ Other (specify)_____		
Triggering action: ☐ Actual RA Onsite Construction at OU1____☐ Actual RA Start at OU#____ ☐ Construction Completion☒ Previous Five-Year Review Report ☐ Other (specify) _____		
Triggering action date ***(from WasteLAN)*****:** September 2004		
Due date ***(five years after triggering action date)*****:** September 2004 *["OU" refers to operable unit.] **[Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]		

Five-Year Review Summary Form, cont'd.

Issues:

Conditions were identified that could affect the protectiveness of the Source Area (OU-1) remedy and require further data collection, analysis or remedial/corrective actions. The conditions are as follows:

1. Potential current indoor risks above EPA's risk management guidelines based upon an evaluation of the soil gas to indoor air and soil to indoor air pathways for the existing commercial building at UniFirst property.
2. Uncertain water quality conditions downgradient from/near the UniFirst, Grace and NEP properties that may contribute to a potential vapor intrusion pathway.
3. No soil remedy has been implemented at UniFirst (SVE).
4. No property-specific institutional controls implemented at the Source Area properties to prevent public contact with contaminated groundwater and soil above cleanup levels.
5. Persistent groundwater contaminant concentrations at all the Source Area properties.
6. Extraction systems performance (possible insufficient capture of groundwater contamination) at the UniFirst, Grace and Wildwood properties.
7. No groundwater pump and treatment system implemented at NEP following AS/SVE shutdown.
8. No recent data regarding groundwater contaminant concentrations in deep bedrock at NEP.
9. Area south of Wildwood treatment system may have groundwater contamination in excess of ROD cleanup goals not receiving treatment.
10. No groundwater pump and treatment remedy implemented at Olympia.
11. Soil contaminant concentrations at the Grace property exceed ROD Action Levels.
12. The 1988 Endangerment Assessment did not comprehensively evaluate non-ingestion uses of groundwater such as dermal contact during industrial groundwater usage or direct contact during trench excavation under certain current (commercial worker) and future (commercial worker, residential) scenarios at Source Area properties.
13. Arsenic Maximum Contaminant Level (MCL) recently changed from 50 ug/L to 10 ug/L. Arsenic was not previously targeted for cleanup based on prior MCL. Historical arsenic concentrations were either above 10 ug/L, or detection limits exceeded 10 ug/L. In addition, manganese was not identified as a contaminant of concern (COC) in OU-1 groundwater under the 1988 Endangerment Assessment. Manganese toxicity values have been reduced by a factor of 10 since the assessment. Future exposures to manganese in groundwater may exceed EPA's Lifetime Health Advisory.
14. An evaluation of the groundwater to indoor air pathway indicates potential future risks at the Olympia property (commercial, residential) and Wildwood property (residential) might exceed EPA risk management guidelines should re-development occur. Newly discovered soil contamination on Grace property may also present vapor intrusion issue should redevelopment occur. Re-development at any of the Source Area properties may present a vapor intrusion risk. .
15. AWQC values associated with aquatic life have decreased since the ROD. AWQCs were used to establish effluent limits for remedial system discharges at the UniFirst and Grace properties.

Five-Year Review Summary Form, cont'd.

Recommendations and Follow-Up Actions

The recommendations and follow-up actions correspond to the issues previously identified.

1. Additional data collection at UniFirst property to assess vapor intrusion, and evaluate and implement technical solutions as appropriate.
2. Install additional monitoring wells and collect additional groundwater data downgradient from/near the UniFirst, Grace and NEP properties to assess potential vapor intrusion pathway. Collect any further data, and evaluate and implement technical solutions as appropriate.
3. Review soil contamination issues at UniFirst, collect additional data, and evaluate and implement technical solutions.
4. Property-specific institutional controls should be established at each Source Area property to prevent potential exposures to the public, until the source control remedy has been completed.
5. Additional data collection and/or analysis to diagnose the limited VOC reductions at the Source Area properties, and improve system performance and pace of Site cleanup.
6. Additional data collection and/or analysis to determine whether or not sufficient capture has been achieved at UniFirst, Grace and Wildwood properties, and where appropriate take corrective actions to ensure sufficient capture in the future.
7. Assess groundwater conditions on NEP property since AS/SVE shutdown, evaluate the need for further groundwater treatment, and, where appropriate, consider other treatment remedies.
8. Additional data collection to evaluate deep bedrock groundwater conditions on the NEP property, and where appropriate evaluate groundwater remedial technologies.
9. Assess groundwater conditions south of Wildwood treatment system, evaluate the need for further groundwater and soil treatment, and consider other treatment technologies as appropriate.
10. Evaluate progress of Olympia's soil cleanup (ISCO) at the Former Drum Disposal Area (FDDA) under 2003 and 2004 AOC removal actions to achieve ROD groundwater and soil cleanup standards. Assess need for groundwater cleanup at the conclusion of the removal action.
11. Assess extent of soil contamination exceeding ROD Action Levels on Grace property. Evaluate and implement response actions as appropriate.
12. Because of persistent groundwater contamination at each Source Area property, non-ingestion groundwater exposures should be prevented through the implementation of property-specific controls until the remedy is complete.
13. Assess groundwater conditions relative to arsenic and manganese at UniFirst, Grace, Wildwood and Olympia properties, and where appropriate revise cleanup goals.
14. Evaluate risk from exposure to indoor air at the Source Area properties based on up-to-date data if any of the properties are developed/redeveloped.
15. Assess NPDES equivalent discharge standards based upon current AWQCs and revise discharge limits at UniFirst and Grace properties as appropriate.

Five-Year Review Summary Form, cont'd.

Protectiveness Statement(s)

A protectiveness determination of the Source Area (OU-1) remedy at the Wells G&H Superfund Site cannot be made at this time until further information is obtained. Additional data will be collected to evaluate potential vapor intrusion impacts at the existing building on the UniFirst Source Area property. Additional data will also be collected to evaluate the potential vapor intrusion pathway near the UniFirst, Grace and NEP Source Area properties. Once the data are collected, it will be assessed and a determination will be made whether or not additional measures are necessary to ensure protection of human health. It is expected that these actions will take approximately 6-12 months to complete at which time a protectiveness determination will be made.

In addition, for the Source Area (OU-1) remedy to be protective in the long term, the following measures should be taken:

- Property-specific institutional controls should be established at each Source Area property to prevent potential exposures to the public until the source control remedy has been completed;
- Additional data collection and/or analysis to diagnose the limited VOC reductions and improve system performance and pace of Site cleanup; additional data collection and/or analysis to determine whether or not sufficient capture has been achieved and, where appropriate, take corrective actions to ensure sufficient capture is occurring in the future; assessment of groundwater conditions on NEP property since AS/SVE shutdown, evaluation of the need for further groundwater treatment, and where appropriate consideration of other treatment technologies; additional data collection to evaluate deep bedrock groundwater conditions on the NEP property, and where appropriate evaluation of groundwater remedial technologies;
- Assessment of groundwater conditions south of the Wildwood treatment system, evaluation of the need for further groundwater and soil treatment, and consideration of other treatment technologies as appropriate; evaluation of progress of Olympia's soil removal action and assessment of the need for groundwater cleanup at the conclusion of the removal action; assessment of the extent of soil contamination on Grace property and evaluation and implementation of response actions as appropriate; prevention of non-ingestion groundwater exposures at each Source Area property through the implementation of property-specific controls until the remedy is complete; assessment of groundwater conditions relative to arsenic and manganese at UniFirst, Grace, Wildwood and Olympia properties, and where appropriate revision of cleanup goals; evaluation of risk from exposure to indoor air based on up-to-date data if any of the Source Area properties are developed/redeveloped; assessment of NPDES equivalent discharge standards based upon current AWQCs and revision of discharge limits, as appropriate; and review of soil contamination issues at UniFirst, collection of additional data, evaluation and implementation of technical solutions.

Currently, no remedy decision has been selected for OU-2 (Central Area Aquifer), which is under investigation. Thus, OU-2 is not evaluated as part of this Five-Year Review. OU-3 (Aberjona River Study) was incorporated into the upstream Industri-Plex Superfund Site OU-2. Thus, further evaluation of OU-3, including Five-Year Reviews, will be conducted as part of the Industri-Plex Site.

A protectiveness statement for the Wells G&H Site as a whole can not be made at this time until information identified above is obtained and evaluated. In addition, additional measures (described above) are necessary for the OU-1 remedy to be considered protective in the long term.

1.0 INTRODUCTION

The purpose of this Five-Year Review is to determine whether the remedy for the Wells G&H Superfund Site (the Site) is protective of human health and the environment. The methods, findings and conclusions of this review are documented in this third Five-Year Review Report. In addition, this report identifies issues found during this Five-Year Review along with recommendations to address them.

United States Environmental Protection Agency (EPA) Region I has conducted this Five-Year Review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The NCP part 300.430(f)(4)(ii) of the Code of Federal Regulations (CFR) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the third Five-Year Review for the Wells G&H Superfund Site. The completion of the second Five-Year Review, in September 2004, is the trigger for this third Five-Year Review. This statutory review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

2.0 SITE CHRONOLOGY

Table 1: Chronology of Site Events	
Event	**Date**
"Riley Well 2" began operation on Wildwood Conservation Corporation (Wildwood) property.	1958
Municipal water well G developed.	1964
Municipal water well H developed.	1967
Woburn police find abandoned drums at Massachusetts Bay Transportation Authority (MBTA) property on Mishawum Road.	1979
The Massachusetts Department of Environmental Protection (MassDEP) finds contamination in the City of Woburn water wells G and H. The wells are subsequently closed.	1979
The United States EPA investigates groundwater contamination.	1981
The Wells G&H Site is proposed for the National Priorities List (NPL).	December 1982
The Wells G&H Site is listed on the NPL.	September 1983
Three Potentially Responsible Parties (PRPs) are ordered by EPA to study groundwater and soil contamination. The PRPs complying with the order are Grace and Co.–Conn (Grace), UniFirst Corporation (UniFirst), and Beatrice Corporation (Beatrice).	1983
EPA begins investigation of the entire 330-acre Wells G&H Site.	1985
Under EPA order, Olympia Nominee Trust (Olympia) removes 12 55-gallon drums from southwest corner of property on west side of Aberjona River in area known as the Former Drum Disposal Area (FDDA).	1986
The United States Geological Survey (USGS) conducts 30-day aquifer test at Wells G&H under agreement with EPA.	1987
Under EPA order, Olympia removes an additional 5 55-gallon drums from southwest corner of property on west side of Aberjona River in FDDA.	1987
EPA issues an Administrative Order to UniFirst to install monitoring wells and remove contaminants.	1987
EPA finishes soil and groundwater studies and completes the Supplemental Remedial Investigation (RI).	September 1988
The "Riley Well 2" production well on the Wildwood property ceases operation.	1989
EPA issues the Wells G&H Record of Decision (ROD), which presents the long-term clean-up approach.	September 14, 1989
Consent Decree (CD) is signed.	September 1990
EPA issues Explanation of Significant Difference (ESD)	April 25, 1991
PRPs begin design of long-term clean-up. Combined Grace-UniFirst groundwater treatment pilot study conducted.	1991
Two of five PRPs begin long-term groundwater clean-up and two others begin soil excavation.	September 1992
Combined Grace-UniFirst groundwater recovery and treatment system commences operation.	September 1992
PRPs (Beatrice, UniFirst, and Grace) issue Phase IA Wells G&H Site Central Area Investigation Report for the Central Area Operable Unit 2 (OU-2).	February 1994
Beatrice issues Draft Remedial Investigation Report for Southwest Properties.	February 1994
Clean Harbors issues Hydrogeologic Characterization Report for Murphy Waste Oil (1	February 1994

Table 1: Chronology of Site Events	
Event	**Date**
of 3 properties of the OU-2 Southwest Properties).	
Remediation of sludge, debris and mixed contaminant soil completed at Wildwood.	1994
EPA and U.S. Fish and Wildlife Service (USFWS) conduct investigations in support of the Aberjona River Study (OU-3).	1995
Clean Harbors issues Addendum I to Hydrogeologic Characterization Report for Murphy Waste Oil Site.	January 1995
Clean Harbors, Inc. issues Corrective Action Investigation Report Part I and II for Murphy Waste Oil Site.	1996 and 1997
Clean Harbors issues Focused Human Health Imminent Hazard Evaluation and Evaluation of Imminent Hazard to Environmental Receptors for Murphy Waste Oil Site.	October 1996
Second round of Aberjona River Study sampling conduced by EPA and Metcalf & Eddy, Inc. (M&E).	1997
EPA investigates Romicon facility as part of OU-2.	Summer 1997
Grace reduced number of pumping wells from the original 22 to current 16 wells.	1997
New England Plastics (NEP) initiates Source Control Remedy (air sparging with soil vapor extraction).	February 2, 1998
EPA conducts Phase I Pre-Design Investigation of FDDA at the Olympia Site.	March 1998
Wildwood soil and groundwater remediation system startup.	May 6, 1998
Clean Harbors issues Addendum to Corrective Action Report (Part II) for Murphy Waste Oil Site.	December 1998
First Five-Year Review report issued.	August 4, 1999
NEP discontinues soil remediation.	March 7, 2000
Wildwood replaces catalytic oxidation unit with activated carbon filtration unit.	June 2000
EPA, TetraTech NUS, Inc. (TTNUS), and M&E conduct supplemental field activities in support of Aberjona River Study (OU-3).	2000-2002
EPA combines the study of Wells G&H OU-3 (the Aberjona River Study) with Industri-Plex OU-2	Spring 2002
Grace replaces ultra-violet/chemical oxidation (UV/Ox) system with two granular activated carbon filters operating in series.	2002
EPA prepares and issues Olympia Data Summary Report.	December 2002
Olympia enters into first Administrative Order on Consent (AOC) with EPA Removal Program to conduct contaminated soil removal activities.	March 12, 2003
EPA issues Draft Baseline Human Health and Ecological Risk Assessment Report for Aberjona River Study (OU-3).	May 2003
EPA issues Draft Preliminary Multiple Source Groundwater Response Plan (MSGRP) Report - Southern Area as part of Industri-Plex/Aberjona River Study that evaluates potential contaminant sources in the Aberjona Watershed south of Route 128.	June 2003
Contaminated surface soil and polychlorinated biphenyl (PCB) material at Olympia property excavated and disposed offsite by PRP.	June – August 2003
Beatrice undertakes Supplemental RI of Southwest Properties and issues Draft Supplemental RI Report.	August 2003
UniFirst replaces UV/Ox system with two carbon adsorption units operating in series.	October 2003
EPA issues Baseline Human Health and Ecological Risk Assessment for the Southwest Properties.	March 2004

Table 1: Chronology of Site Events	
Event	**Date**
Olympia enters into second AOC with EPA Removal Program to address trichloroethene (TCE) impacted soils associated with the FDDA at the Olympia Site.	June 9, 2004
EPA issues second Five-Year Review report for the Wells G&H Site.	September 2004
Olympia initiates In-situ Chemical Oxidation (ISCO) treatment system to address TCE contamination in soil and groundwater at the FDDA.	September 2005
EPA issues ROD for Industri-Plex OU-2 (including Wells G&H OU-3).	January 31, 2006
EPA Removal Program enters into AOC with abutting property owner to address chromium waste along drainage swale at the neighboring former J. J. Riley property.	June 2006
Grace demolishes Site buildings in anticipation of potential redevelopment.	August/September 2006
EPA Removal Program performs removal actions to address PCB contaminated soils at the neighboring former waste oil facility on Salem Street.	June 2007
EPA conducts review of PRP soil and soil gas data at UniFirst property	February 2008
Owner of former Aberjona Auto Parts property (within Southwest Properties) constructs public ice rink facility.	September 2008
EPA enters into Consent Decree settlement with Bayer CropScience, Inc., and Pharmacia Corporation for cleanup of Industri-Plex OU-2 (including Wells G&H OU-3) consistent with January 2006 ROD.	November 2008
EPA issues draft comment letters for Wells G&H OU-1 and OU-2.	May 2009

3.0 BACKGROUND

3.1 Physical Characteristics/Land and Resource Use

The Wells G&H Superfund Site covers approximately 330 acres in east Woburn, Middlesex County, Massachusetts (see Figure 1 in Attachment 1). The Site includes the aquifer and land located within the zone of contribution of two former municipal drinking water wells known as Wells G and H, which are located adjacent to the Aberjona River. The boundaries of the Site are Route 128 (Interstate 95) to the north, Route 93 to the east, the Boston and Maine (B&M) Railroad to the west, and Salem and Cedar Streets to the south (see Figure 1 in Attachment 1). Wells G and H are located in the sand and gravel aquifer of the Aberjona River basin within the Mystic River watershed.

The Site is currently a mixed use area consisting of light industry, commercial businesses, office and industrial parks, residences, and recreational property. Predominantly residential property is located to the south of the Site. Former land uses in this area consisted of traditional industries such as manufacturing, warehousing, and distribution (GeoTrans, 1994) as well as agricultural uses such as piggeries and flower nurseries (TRC, 2002).

The Site is divided into three operable units, the Source Area (OU-1) properties, the Central Area (OU-2), and the Aberjona River Study (OU-3), which are briefly described below. Note that in the Spring of 2002, EPA combined the study of Wells G&H OU-3 (the Aberjona River Study) with Industri-Plex OU-2. In January 2006, EPA issued a ROD for Industri-Plex OU-2 (including Wells G&H OU-3). In November 2008, EPA entered into a Consent Decree with Bayer CropScience Incorporated and Pharmacia Corporation for the implementation of the Industri-Plex OU-2 (including Wells G&H OU-3) remedy consistent with the January 2006 ROD.

3.1.1 Operable Unit 1 – Source Area Properties

The OU-1 Source Area properties consist of the W.R. Grace & Company (Grace), UniFirst Corporation (UniFirst), New England Plastics (NEP), Wildwood Conservation Corporation (Wildwood), and Olympia Nominee Trust (Olympia) properties, the locations of which are depicted on Figure 2 (provided in Attachment 1). The UniFirst property is located at 15 Olympia Avenue. The Grace property is approximately 13 acres and is located at 369 Washington Street on the northeastern portion of the Site. The Olympia property is approximately 23.1 acres located at 60 Olympia Avenue on the western boundary of the Site. NEP property is approximately 2 acres located at 310 Salem Street. The NEP office and plant are on the south side of Cummings Office Park and west of Washington Street. The Wildwood Property is approximately 15 acres located at 278 Rear Salem Street.

The UniFirst facility was a uniform service facility with an in-house dry cleaning operation. In 1965, the site was developed and the facility eventually included office space, processing and storage of industrial uniforms, dry cleaning, and a truck storage garage (PRC, 1986). However, representatives of Harvard Project Services (consultant to UniFirst) assert that no dry-cleaning occurred at the UniFirst property, just bulk storage of solvents (Cosgrave, 2004). The property is currently used for storage by another company (Extra Space Storage, Inc.). Downgradient of the

UniFirst property are residential and commercial properties, as well as wetlands connected to the Aberjona River.

Grace purchased the 369 Washington Street facility in 1960 and fabricated food wrapping/packaging equipment (PRC, 1986). The Grace property is currently vacant and was under consideration by the Woburn Redevelopment Authority (WRA) for development opportunities. Potential uses reviewed by the WRA include office space, research and development, hotel, retail/business services, and light manufacturing (WRA, 2002a). In August and September 2006, Grace demolished all site buildings, except the treatment building, in anticipation of potential redevelopment of the property. Downgradient of the Grace property are residential and commercial properties.

NEP began operations in 1965 and manufactures vinyl siding and custom molded plastic items. Prospect Tool and Die Company rented space from NEP beginning in 1967 and began operations as a machine shop (Ebasco, 1989; CEI, 1992). NEP continues to operate a plastics manufacturing facility. On-site contamination at NEP has been attributed in the past to NEP and their former tenant, Prospect Tool and Die Company. A residence is located immediately downgradient of the NEP site and downgradient of groundwater monitoring well 106B (Hamel, 2004).

The Wildwood property is 15 acres of woodland and open space adjacent to the Aberjona River on the western floodplain. The Wildwood property was formerly owed by the J. J. Riley Tannery, which was purchased in 1979 by Beatrice Foods. The only land use of the Wildwood property was the construction and use of a production well (Riley Well 2) in 1958 for the former J. J. Riley Tannery, which was located west of the Wildwood property across the B&M Railroad. The operation of Riley Well 2 was discontinued in 1989. The only structures currently on-site are the Riley Well 2 well house and a building housing the groundwater treatment system. Downgradient of the Wildwood property are wetlands and the Aberjona River. The projected land use shows Wildwood remaining undeveloped, with a nature area/walking trails located on City property east and across the river (WRA, 2002b).

The 23.1-acre Olympia property is located on Olympia Avenue and is split by the Aberjona River. The eastern portion of the property was developed as a trucking terminal in 1963 and is presently used as such. The western portion of the Olympia property is the site of a FDDA, and is the source of groundwater contamination associated with the Olympia property and addressed in the ROD.

A truck terminal currently occupies approximately eight acres of the northeast corner of the Olympia property on the east side of the Aberjona River and includes a one-story terminal building and associated paved parking areas on all sides of the terminal building. Downgradient of the Olympia property are wetlands and the Aberjona River.

The mechanism of release at the FDDA appears to have been leaking drums. The drums were discovered in 1979/1980 by representatives of MassDEP (then the Department of Environmental Quality Engineering [DEQE]). The drums were removed in 1986 and 1987 by Olympia under EPA orders. EPA conducted extensive sampling and analysis of soil and groundwater in 2002

and delineated soil and groundwater contamination at the FDDA. Surface soils were contaminated with PCBs, and subsurface soils and groundwater were primarily contaminated with TCE. EPA believes that this area serves as an ongoing source of TCE contamination to the groundwater and to the Aberjona River that flows through the property. Pursuant to a June 2004 AOC, a PRP-lead removal action is underway at this portion of the site.

3.1.2 Operable Unit 2 – Central Area

The Central Area (OU-2) consists of all groundwater and land within the area defined as the Wells G&H Superfund Site, excluding the areas defined for Source Area (OU-1) properties and the Aberjona River Study (OU-3) (now merged with Industri-Plex OU-2).

The groundwater aquifer underlying the Site is not currently used as a municipal drinking water source. The objectives listed in the Site ROD include restoring the aquifer to drinking water standards. The community has consistently stated that it is opposed to utilizing Wells G and H as a drinking water supply, although the City of Woburn has expressed interest in having the source available for the future (MassDEP, 2004). MassDEP's Groundwater Use and Value Determination assigned a "medium" use and value for the Site aquifer, based on a balanced consideration of several factors. The Groundwater Use and Value Determination concludes that the aquifer may be used in the future for domestic and industrial purposes.

The portion of the Central Area (OU-2) known as the Southwest Properties includes the Aberjona Auto Parts, Whitney Barrel, and Murphy Waste Oil properties. Aberjona Auto Parts began operations in the mid-1950s for the sale and reconditioning of used and wrecked automobiles, and was also a gasoline service station (NUS, 1986). The Aberjona Auto Parts business is no longer in operation. The current owner has cleared the property of debris. The property is currently occupied by an automotive repair shop, a landscaper, a residence, and a newly constructed ice rink.

The Whitney Barrel Company located on Salem Street commenced operations in 1949, and reconditioned drums, boilers, tanks and machinery (NUS, 1986). The Whitney Barrel property is currently occupied by several commercial businesses such as landscapers and automotive glass repair.

The Murphy Waste Oil property is a Resource Conservation and Recovery Act (RCRA)-permitted Treatment, Storage and Disposal Facility (TSDF) operated by Clean Harbors, Inc. The property lies to the west of the Whitney Barrel property and to the east of the B&M Railroad. It is predominantly covered by fill. North and east of the fence that surrounds the waste oil facility is a wetland area referred to as the "Murphy Wetland" which is connected to the Aberjona River.

3.1.3 Operable Unit 3 – Aberjona River Study

The Aberjona River Study (OU-3) area consists of the Aberjona River and its tributaries, sediments, and associated 38-acre wetland area that lie within the 330-acres of the Site. The Aberjona River begins in Reading, Massachusetts, and flows through the Industri-Plex

Superfund Site to the north of Route 128 before flowing through the Site, and eventually reaches the Mystic Lakes in Winchester.

Historically, the Aberjona River watershed contained numerous industrial facilities. The types of manufacturing in the Aberjona River watershed included leather processing, tanning factories, shoe and boot factories, machine shops, and chemical manufacturing. The watershed also includes the Industri-Plex Superfund Site, which is located approximately 1.5 miles upstream from municipal Wells G and H. The land within the watershed is highly developed, but with a higher percentage of office and commercial business space than the industrial and manufacturing land uses seen in the past. In Spring 2002, OU-3 was combined with Industri-Plex OU-2. EPA entered into a Consent Decree with Bayer CropScience, Inc., and Pharmacia Corporation for cleanup of Industri-Plex OU-2 (including Wells G&H OU-3) consistent with the January 2006 ROD.

The protectiveness of the remedy selected for Industri-Plex OU-2 (including Wells G&H OU-3) will be evaluated during the Five-Year Review for the Industri-Plex Site.

3.2 History of Contamination

On May 4, 1979, 184 55-gallon drums containing polyurethane and toluene diisocyanate were found on Mishawum Road on a vacant lot owned by the MBTA. The drum discovery prompted DEQE to sample the nearest downgradient public water supply, Wells G and H (NUS, 1986).

Several chlorinated volatile organic compounds (VOCs) were detected in water from Wells G and H at concentrations ranging from 1 to 400 parts per billion (ppb) and, as a result, Wells G and H were shut down on May 21, 1979. Since then, the Metropolitan District Commission (MDC) (now the Massachusetts Water Resources Authority or MWRA) supplements the City of Woburn's water supply.

EPA and various property owners have conducted numerous studies to determine the nature and extent of contamination at the Site. The following five facilities have been identified as sources of contamination – Grace, UniFirst, NEP, Wildwood, and Olympia. Wells G&H Superfund Site was listed as a Superfund Site on the NPL on December 21, 1982.

3.3 Initial Response

EPA evaluated the hydrogeology and groundwater quality of a ten square-mile area east and north of Woburn in 1981 to determine the extent of contamination and identify sources. Following a Hazard Ranking System (HRS) scoring, the Site was listed on the NPL on December 21, 1982 (NUS, 1986).

In May 1983, three administrative orders pursuant to Section 3013 of RCRA were issued to Grace, UniFirst, and Beatrice. The administrative orders required proposals from each company for sampling, analysis, monitoring, and reporting to address possible groundwater contamination on or emanating from their properties. Groundwater monitoring programs were subsequently initiated by the companies at their respective properties (NUS, 1986).

In 1986 and 1987, EPA issued orders pursuant to Section 106 of CERCLA to Olympia who subsequently removed approximately 17 55-gallon drums and debris from the western portion of their property in the area known as the FDDA (EPA, 1989; TRC, 2002).

EPA's 1987/1988 Supplemental Remedial Investigation/Feasibility Study (RI/FS) for the Site included soil and groundwater sampling from potential groundwater contaminant source properties including Grace, UniFirst, Olympia, Wildwood, and NEP. EPA also collected surface water and sediment samples from the Aberjona River to support the Endangerment Assessment.

The Supplemental RI/FS identified the Grace, UniFirst, Wildwood, NEP and Olympia properties as the likely sources of groundwater contamination in the vicinity of Wells G and H. EPA also identified soil contamination above target levels on the Wildwood, UniFirst, NEP and Olympia properties. Specifically, EPA found the following: a mixture of VOCs, pesticides, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs) and lead at Wildwood; VOCs at UniFirst; PAHs at Olympia property; and VOCs at NEP. Aberjona River and wetland sediment samples contained PAHs and metals such as arsenic, mercury and chromium. Finally, sludge and debris were identified at Wildwood.

EPA issued a ROD for the Site in September 1989. The ROD required soil and groundwater contamination be addressed at the Source Area properties.

A Consent Decree (CD) was signed by EPA and several PRPs, including Grace, UniFirst, Beatrice and NEP, in 1990 and entered by the Court in 1991. (EPA, 1991). Olympia did not sign the 1991 Consent Decree.

3.4 Basis for Taking Action

The following summarizes the contaminants detected at the Site as identified in the ROD.

Groundwater. Chlorinated VOCs were the primary groundwater contaminants. Groundwater contamination has been found in overburden and bedrock aquifers at the Grace, UniFirst, Wildwood and NEP properties as well as the Central Area (OU-2) of the Site. Groundwater contamination was also found in the overburden aquifer at the Olympia FDDA.

The Grace contamination consisted primarily of chlorinated solvents characterized by a high percentage of TCE and 1,2-dichloroethene (DCE). Other contaminants include tetrachloroethene (PCE) and vinyl chloride. The UniFirst contamination was predominantly PCE. Secondary constituents were 1,1,1-trichloroethane (1,1,1-TCA), and smaller amounts of TCE and 1,2-DCE. The Wildwood contamination consisted primarily of TCE detected at a number of wells, with 1,1,1-TCA, DCE, and PCE detected at a few locations. At Olympia, TCE and xylene were detected in the overburden. At NEP, PCE, TCE, 1,1,1-TCA and 1,2-DCE were found in bedrock and overburden wells.

Soil. Chlorinated VOCs are the primary contaminants in soil and were found at various levels on the Wildwood, Olympia, Grace, NEP and UniFirst properties. Some chlorinated VOC soil contamination was also found in a wetland area at Wildwood.

Other soil contaminants include PCBs, chlordane, phthalates, and PAHs, which were found dispersed throughout the Wildwood property. PAHs were found in one location at Olympia. Phthalates were found in a small area at NEP. Assorted debris and sludge contaminated with lead, VOCs, PAHs, and pesticides were also found at Wildwood.

Sediment/River. Aberjona River and wetland sediments were contaminated with PAHs, PCBs, pesticides, and metals such as arsenic, copper, mercury, zinc, and chromium. Surface water samples revealed low levels of chlorinated VOCs. Metals and phthalates were also noted in surface water.

Air. Air monitoring, conducted during all site investigations, did not reveal any VOC readings above background at the breathing zone.

Potential health risks identified at the Site include residential ingestion of groundwater, dermal contact with groundwater, and inhalation of volatiles while showering, or trespasser and residential incidental ingestion of surface soils (EPA, 1989). Arsenic in sediment was identified as contributing to risk above a level of concern for recreational site use. For ecological receptors, the evaluation indicated potential risk to aquatic life due to metals and phthalates in surface water. Potential risk to invertebrates and mammals were identified due to metals, pesticides, PAHs, and PCBs in sediments.

4.0 REMEDIAL ACTIONS

4.1 Remedy Selection

The following discusses the remedy selected for the Source Area (OU-1) properties and the approaches to selecting a remedy for the Central Area (OU-2) and the Aberjona River Study (OU-3).

4.1.1 Operable Unit 1 – Source Area Properties

EPA's September 14, 1989 ROD described the remedy for the Source Area (OU-1) properties as follows:

- Treatment of contaminated soil using in-situ volatilization at Wildwood property;
- Excavation and on-site incineration of contaminated soils at Wildwood, Olympia, NEP, and UniFirst;
- Treatment and/or disposal of sludge and debris found at Wildwood property in a manner to be determined during the design phase of the clean-up; and
- Extraction and treatment of contaminated groundwater separately at the five Source Area properties using pre-treatment for metals and an air stripper to remove volatile organic contaminants, or an equally or more effective technology approved by EPA. The extraction systems were to be designed to address the specific bedrock and/or overburden contamination at each Source Area property.

The selected Source Area (OU-1) remedy was developed to satisfy the following remedial objectives that guide remedy design and measure success.

<u>Remedial Objectives for Soil</u>

The remedial objectives for contaminated soil were:

- Prevent public contact with contaminated soil above clean-up levels;
- Stop the leaching of soil contaminants to groundwater; and
- Protect natural resources at the Site from further degradation.

EPA identified site-wide clean-up goals for each of the chemicals of concern in soil that satisfy the above objectives. The soil clean-up goals represent the concentrations that can remain in soil and still be considered protective of human health.

Remedial Objectives for Groundwater

The remedial objectives for contaminated groundwater were:

- Prevent the further introduction of contaminated groundwater from the source areas to the Central Area;
- Limit the further migration of contaminated groundwater off-site from the source areas;
- Restore the bedrock and overburden aquifers in the vicinity of the source areas to drinking water quality; and
- Prevent public contact with contaminated groundwater above the clean-up levels.

The target groundwater clean-up levels are based upon the classification of the groundwater at the Site as a potential source of drinking water. EPA identified Maximum Contaminant Levels (MCLs) promulgated under the Safe Drinking Water Act (SDWA) as the clean-up goals for Site groundwater. These goals satisfy the above objectives and are protective of human health.

EPA's April 25, 1991 ESD described three significant changes and one non-significant change from the remedial actions to be undertaken at the Source Areas (OU-1) as set forth in the ROD. Those changes were as follows:

Significant Changes

- On-site incineration of soils at the Wildwood, NEP, and Olympia properties was changed to off-site incineration;
- In-situ volatilization would be used on the UniFirst property rather than incineration; and
- A typographical error was corrected resulting in more stringent target clean-up levels for groundwater.

Other Non-Significant Change

- Groundwater extraction systems could be combined for the UniFirst and Grace properties.

The 1991 ESD provided for certain changes to the soil and groundwater remedy, but the overall remedy remained fundamentally the same: incineration and in-situ volatilization of contaminated soils, removal of sludge and debris, and extraction and treatment of groundwater at the source areas.

4.1.2 Operable Unit 2 – Central Area

The ROD called for a study of the Central Area Aquifer to determine the most effective way of addressing contamination in the Central Area.

The objectives of the Central Area Study, as identified in the ROD, included:

- Define the nature and extent of contamination in the Aberjona River.
- Define the upgradient introduction of contaminants to the Aberjona River.
- Refine the present understanding of the interaction of the Aberjona River and the aquifer systems on the Site.
- Evaluate the effectiveness of pump and treat as a remedial alternative for the clean-up of contaminated groundwater in the Central Area.
- Evaluate the impact of pumping the Central Area aquifer on the Aberjona River and associated wetlands.
- Identify and evaluate innovative remedial technologies for aquifer restoration, e.g., in-situ bioremediation.
- Evaluate the mobility of contaminants including semi-volatile organics and metals under ambient and pumping conditions.

Three industrial properties located within the Central Area (Southwest Properties [Murphy Waste Oil, Whitney Barrel, and Aberjona Auto Parts]) were also included as part of the OU-2 remedial investigation and feasibility study.

A remedial decision has not yet been reached for the Central Area (OU-2). Thus, it is not evaluated as part of this Five-Year Review.

4.1.3 Operable Unit 3 – Aberjona River Study

EPA conducted the Aberjona River Study (OU-3) for the Site. The Aberjona River Study is designed to investigate the nature and extent of contamination in the Aberjona River sediments and surface water as well as evaluate potential human and ecological risks.

The Aberjona River flows from north to south through both the Industri-Plex and Wells G&H Superfund Sites and, thus, is a conduit for contaminant migration from the sites. Sediment samples from the Aberjona River and wetlands in the Site are contaminated with metals such as arsenic, chromium, and mercury, and PAHs.

When data obtained from studies at the Industri-Plex (North of Route 128) and Wells G&H (South of Route 128) Superfund Sites indicated that the Aberjona River at both sites contained

similar Contaminants of Concern (COCs), EPA concluded that separate approaches to the river and wetlands were no longer reasonable or efficient. As a result, EPA combined the Wells G&H Aberjona River Study with the Industri-Plex Operable Unit 2 (OU-2) MSGRP RI/FS.

In September 2004, EPA completed the Wells G & H OU-3 Revised Aberjona River Study Baseline Risk Assessment, which identified potential risks along Wells G&H 38-acre wetland (River Reach 1) and the former Cranberry Bog (portion of River Reach 2) immediately south of the Wells G&H Site due to potential exposures to sediments contaminated with metals (e.g., arsenic).

In March 2005, EPA completed the Industri-Plex OU-2 (including Wells G&H OU-3) MSGRP RI. This comprehensive RI describes the contamination and risks along the Halls Brook Holding Area (HBHA) and Aberjona River from the Industri-Plex Site to the Mystic Lakes, and how contamination is migrating along the river system. The March 2005 RI combined and refined the baseline risk assessments from Industri-Plex to the Mystic Lakes along the Aberjona River.

In June 2005, EPA prepared and released the Industri-Plex OU-2 (including Wells G&H OU-3) Feasibility Study (FS) and Proposed Plan. The public comment period was held from July 1, 2005 through August 31, 2005. In October 2005, EPA prepared and released a Technical Memorandum - Evaluation of Ammonia and Supplemental Soil Data, a Fact Sheet Supplementing the June 2005 Proposed Plan, and re-opened the public comment period from October 20, 2005 to November 18, 2005.

On January 31, 2006, EPA prepared and released the Industri-Plex OU-2 (including Wells G&H OU-3) ROD. The major components to the remedy include:

- Dredging and off-site disposal of contaminated sediments in the southern portion of the HBHA Pond; dredging and off-site disposal of contaminated near-shore sediments at the Wells G&H Wetland and Cranberry Bog Conservation Area; and restoration of all disturbed areas. This component addresses sediments posing unacceptable human health risks for near-shore sediments and unacceptable ecological risks for the southern portion of the HBHA Pond.

- Use of the northern portion of the HBHA Pond as a sediment retention area (primary and secondary treatment cells) that will intercept contaminated groundwater plumes (including arsenic, benzene, ammonia, 1,2-dichloroethane, trichloroethene, and naphthalene) from Industri-Plex OU-1, treat/sequester COCs (including arsenic, benzene, and ammonia), and minimize downstream migration of contaminants (including arsenic, benzene, and ammonia). The primary treatment cell will intercept the contaminated groundwater plumes discharging in the HBHA Pond. The effluent from the northern portion of the HBHA Pond (secondary treatment cell outlet) will serve as the surface water compliance boundary and achieve National Recommended Water Quality Criteria (NRWQC). Sediments that accumulate in the northern portion of the HBHA Pond will be periodically dredged and sent off-site for disposal. Portions of stormwater from Halls Brook, which may interfere with the natural treatment processes occurring within the

northern portion of the HBHA Pond, will be diverted to the southern portion of the HBHA Pond.

- If necessary, In-situ Enhanced Bioremediation of contaminated groundwater plumes (e.g., benzene) at the West Hide Pile (WHP).

- Construction of an impermeable cap to line stream channels (e.g., New Boston Street Drainway), and to prevent the discharge of contaminated groundwater plumes, contamination of stream sediments, downstream migration of COCs and potential impacts to other components of the selected remedy.

- Construction of a permeable cap to prevent contaminated soil erosion (e.g., Industri-Plex Area A6), downstream migration of COCs, and potential impacts to other components of the selected remedy.

- Establishing institutional controls to restrict contact with soils, groundwater, or deeper interior wetland sediments with concentrations above cleanup standards and protect the remedy.

- Construction of compensatory wetlands for any loss of wetland functions and values associated with the selected remedy (e.g., northern portion of HBHA Pond, Halls Brook stormwater by-pass, capped stream channels) nearby in the watershed.

- Long-term monitoring of the groundwater, surface water, and sediments, and periodic Five-Year Reviews of the remedy.

The protectiveness of the remedy selected for Industri-Plex OU-2 (including Wells G&H OU-3) will be evaluated during the Five-Year Review for the Industri-Plex Site.

4.2 Remedy Implementation

The history and status of remedy implementation at the Wells G&H site is discussed below by operable unit.

4.2.1 Operable Unit 1 – Source Area Properties

This history and status of remedial actions at the Source Area (OU-1) properties is discussed below by property. Attachment 2 contains tables summarizing groundwater monitoring well data that have exceeded ROD cleanup levels within the last five years of monitoring conducted by the PRPs.

4.2.1.1 UniFirst and Grace Properties

The groundwater extraction and treatment systems for both properties began operation in September 1992, and consisted of two extraction and treatment systems. The UniFirst property has one pumping well (UC-22) which is designed to capture contaminants in the unconsolidated

deposits, shallow bedrock, and deep bedrock at the UniFirst property, as well as capture contaminants in deep bedrock at the Grace property. The Grace property currently has 16 pumping wells which are designed to capture contaminants in the unconsolidated deposits and shallow bedrock (GeoTrans et al., 2008; HPS, 2008). The remedial systems are currently in the 16th year of operation.

UniFirst's treatment system for groundwater originally included UV/Ox followed by two carbon adsorption units operating in series. Due to decreased contaminant levels, the UV/Ox system was no longer required and the system was modified in October 2003 (HPS, 2003). The UV/Ox system was replaced with granular activated carbon (GAC) filters. Treated groundwater is discharged to a storm sewer (HPS et al, 2008), which flows and discharges to the Aberjona River by Olympia Avenue. Some on-site monitoring wells have achieved the ROD target clean-up levels, while over the last 5 years the remaining wells monitored at the Site have remained consistent or show minor decreases in contaminant concentrations (HPS, 2008).

Attachment 2.1 contains a table summarizing UniFirst groundwater monitoring data over the last five years of monitoring that have exceeded ROD cleanup levels. A figure illustrating monitoring well locations is also included in Attachment 2.

The UniFirst remedy set forth in the ROD also included soil vapor extraction (SVE) treatment of contaminated soil. However, the soil treatment remedy has not been implemented at UniFirst. The PRPs have historically expressed concerns with the timing/phasing of soil remedy implementation.

The Grace groundwater treatment system initially included particulate filtration and UV/Ox treatment. Treated groundwater is discharged to Snyder Creek. System modifications in 1997 included the reduction in pumping wells from the original 22 to the current 16 wells. In 2002, the use of the UV/Ox reactor was discontinued and replaced with two GAC filters in series (GeoTrans, 2003). The remedial system is designed to capture groundwater in the unconsolidated deposits and shallow bedrock before traveling offsite (GeoTrans, 2008). The remaining groundwater contamination emanating from Grace is, by design, allowed to migrate towards the UniFirst property and is reportedly captured by the UniFirst extraction well (UC-22).

Attachment 2.2 contains a table summarizing Grace groundwater monitoring data over the last five years of monitoring that have exceeded ROD cleanup levels. A figure illustrating monitoring well locations is also included in Attachment 2.

4.2.1.2 NEP

The remedial design for NEP from the CD included the removal of approximately 10 cubic yards of soil for off-site incineration, delineating the nature and extent of groundwater contamination, and development of a groundwater pump and treat system (CEI, 1992).

Ultimately, the source control remedy for NEP included air sparging with soil vapor extraction (AS/SVE). This system ran from February 1998 to March 2000. At the time of system shut down, ROD clean-up concentrations in unsaturated soils had been achieved and significant

reductions in VOCs in groundwater were realized. TCE and PCE levels in site groundwater decreased significantly in the source area and downgradient overburden and shallow bedrock groundwater. However, TCE and PCE contamination remains present in groundwater above ROD action levels and there are no recent data regarding groundwater contaminant concentrations in deep bedrock.

Annual groundwater monitoring is conducted by the PRP to identify contaminant trends. Nine wells in the plume area are sampled annually (Woodard & Curran, 2008); sampling of other wells was discontinued in 2001 (Hamel, 2004). Statistical trend analysis indicates that some wells in the PRP's routine monitoring network have a decreasing concentration trend for PCE and TCE at a 95-percent or greater confidence level, with some wells indicating neither an increasing or decreasing trend for PCE (Woodard & Curran, 2008). However, PCE groundwater contamination is still present above the ROD action level in monitoring wells NEP-101 and NEP-106B. TCE was not detected (at a reporting limit of 5 ug/L) in any of the nine monitoring wells in 2008 (Woodard & Curran, 2008). In addition, as noted previously, there are no recent data regarding groundwater contaminant concentrations at depth in bedrock.

Attachment 2.3 contains a table summarizing NEP groundwater monitoring data over the last four or five years of monitoring that have exceeded ROD cleanup levels. A figure illustrating monitoring well locations is also included in Attachment 2.

4.2.1.3 Wildwood Property

As of February 1994, debris, soil, and drums were removed from the Wildwood property (GeoTrans, 1994). A subsurface remediation system for soil and groundwater was constructed and began operation in May 1998. The remediation system includes groundwater pumped from a series of wells screened at varying depths in bedrock combined with AS/SVE (ENSR, 2008). Treated groundwater is discharged to the sewer situated on Salem Street.

The Wildwood remedial system has undergone changes during treatment system operations. The monthly monitoring of the vapor collection system was conducted using a photoionization detector (PID) or flame ionization detector (FID). The field screening readings were inconclusive due to moisture or the presence of methane, and monthly system air analytical sampling began in April 2001 (RETEC, 2004; ENSR, 2008). The vapor extraction system used a Catalytic Oxidation (CATOX) unit with an acid gas scrubber to treat vapors until June 12, 2000. The current configuration consists of a vapor phase GAC system treating all SVE vapors (ENSR, 2008). The AS system consists of 24 air injection wells within a 2-acre area. The AS wells operated in a pulse mode until February 2003. The sparging sequence and duration was modified to provide increased efficiency and VOC recovery (RETEC, 2004). Significant savings in electrical power costs were realized as a result of the sparging sequence modifications (Greacen, 2004). Similar to prior years, the sparging flow rates during year 9 ranged from 2 to 8 standard cubic feet per minute (ENSR, 2008).

A review of the remedial system trends indicates decreased or stabilized concentrations of influent vapor-phase VOCs, dissolved-phase VOCs in groundwater, and VOCs in overburden and bedrock aquifers (ENSR, 2008). However, TCE groundwater contamination concentrations

remain in many monitoring wells above the ROD action level. Also, since the startup of the treatment, increased TCE concentrations have been observed at monitoring well BSW 1. Treatment system operations are ongoing.

Attachment 2.4 contains a table summarizing Wildwood groundwater monitoring data over the last five years of monitoring that have exceeded ROD cleanup levels. A figure illustrating monitoring well locations is also included.

At the time the remedy was implemented, the southern portion of the Wildwood property was not targeted for treatment. However, more recent information indicates that chlorinated solvent contamination in excess of MCLs is present in this area.

4.2.1.4 Olympia Property

EPA reached an agreement with Olympia in Spring 2003 to continue the clean-up of contaminated soils on the Olympia property. Under an AOC, Olympia excavated and disposed of 56 cubic yards of PCB-contaminated surface soils, and approximately 5 cubic yards of PAH-contaminated soil, evaluated various options for addressing the TCE-contaminated soils, and prepared a detailed work plan for cleaning up the TCE by way of in-situ sodium permanganate injection treatment (a form of in-situ chemical oxidation). In March 2004, EPA granted conditional approval of the TCE Work Plan (EPA, 2004a). In June 2004, EPA entered into a second AOC with Olympia to implement the approved TCE Work Plan. EPA continues to oversee the work outlined in the second AOC. Under the second AOC, Olympia undertook the following work to address subsurface TCE contamination (EPA, 2004b):

- Define the extent of subsurface contamination (as needed), monitor progress of treatment, and document successful clean-up (when attained);
- Treat (oxidize) TCE-contaminated subsurface soils in-situ by sodium permanganate injection;
- Re-vegetate and grade the site; and
- Conduct post-cleanup groundwater quarterly monitoring for three years.

The in-situ chemical oxidation (via permanganate) cleanup action was initiated by the PRP for the FDDA portion of the Olympia Property in the Fall 2005. The major components of the removal action include:

- A sheet pile wall installed to a depth of approximately 15 feet around the perimeter of the FDDA (an area approximately 180 feet long and 100 feet wide);
- Delivery of permanganate to the silt unit via a multi-depth injection network;
- Multiple applications of oxidant via gravity drainage; and

- Monitoring of groundwater conditions within the FDDA via a network of nested monitoring wells and discrete geoprobe water samples.

The sheet pile wall is used to help focus oxidant delivery within the area of highest contaminant concentrations, as well as limiting continued impacts to the Wells G&H aquifer. Focused oxidant injections are also targeted on areas with contamination outside the sheet piling. EPA will evaluate TCE cleanup and groundwater monitoring data, and, as necessary, consider the need for further groundwater treatment. Since Fall 2008, the monitoring and injection approach for the FDDA includes 3 month cycles where injections occur from October – December and April – June, while monitoring and evaluations occur in the January-March and July-September timeframes. This approach is consistent with the revised work plan dated October 2008.

Soil and groundwater clean-up goals are as set forth in the ROD. Recent groundwater data collected by the PRP in 2008 and 2009 indicate that groundwater contaminant concentrations continue to exceed ROD cleanup criteria, and are tabulated in Attachment 2.5. A figure illustrating monitoring well locations is also included in Attachment 2.

4.2.2 Operable Unit 2 – Central Area

A remedy has not been selected for the Central Area (OU-2). Thus, it is not evaluated as part of this Five-Year Review.

4.2.3 Operable Unit 3 – Aberjona River Study

A remedy has been selected for the Aberjona River Study (OU-3) as set forth in the Industri-Plex OU-2 (including Wells G&H OU-3) ROD. See Section 4.1.3 for a description of the remedy. EPA entered into a CD settlement with Bayer CropScience, Inc., and Pharmacia Corporation for cleanup of Industri-Plex OU-2 (including Wells G&H OU-3) consistent with the January 2006 ROD. Currently, this portion of the project is in the remedy design phase (EPA, 2009). Detailed information on the current status is available from EPA's Industri-Plex web page. The protectiveness of the Industri-Plex OU-2 (including Wells G&H OU-3) remedy will be evaluated during the Five-Year Review for the Industri-Plex Site.

4.3 System Operations/Operation and Maintenance (O&M)

O&M descriptions are provided below for each source area property (UniFirst, Grace, Wildwood, NEP and Olympia). However, the remedial actions underway at these properties are lead by various responsible parties and no O&M costs were available at the time of this Five-Year Review.

4.3.1 UniFirst

UniFirst's deep bedrock groundwater extraction and treatment system has been in operation for approximately 16 years. Bi-monthly samples are taken from the treatment system influent and monthly samples are taken from the treatment system effluent. Routine O&M includes weekly system inspections, quarterly sensor check, and annual inspection and maintenance (HPS, 2008).

At the time of the second Five-Year review Site Inspection, the groundwater extraction well pump had undergone replacement due to recent failure. The replacement pump was not capable of lowering the groundwater table to the design elevation of 15 feet above mean sea level (AMSL) (Cosgrave, 2004). However, subsequent documentation indicated that the design elevation was eventually attained following system adjustments (HPS, 2004). See Section 5.0 and 6.4 for additional observations from the Five-Year Review inspection of the UniFirst site.

4.3.2 Grace

Grace's overburden and shallow bedrock groundwater extraction and treatment system has been in operation for approximately 16 years. The O&M for the Grace property includes monthly sampling of the treatment system at the first and second GAC vessel effluent, monthly influent sampling, and annual sampling of 12 monitoring wells, 6 recovery wells and Snyder Creek (discharge point) (GeoTrans et al., 2008).

4.3.3 Wildwood

Wildwood's AS/SVE and bedrock groundwater extraction and treatment system has been in operation for approximately 10 years (documentation available up through year 9 in ENSR, 2008). Monitoring activities at Wildwood include analysis of process water, process vapor and groundwater. Monthly process monitoring activities are conducted for the treatment system. Monthly monitoring activities include:

- Groundwater extraction/treatment system
  - Pressure readings
  - Influent and effluent sampling
- Air sparging system
  - Flow readings
  - Pressure readings
- Vapor extraction/treatment system
  - Vacuum readings
  - Flow readings
  - Analytical sampling of air from influent, lead carbon effluent, total effluent
  - PID readings of ambient air

Groundwater monitoring well sampling is conducted quarterly for a select number of wells and annually for a larger selection of wells.

4.3.4 NEP

NEP implemented an AS/SVE treatment system that was operational for approximately 2 years between 1998 and 2000. This system was intended to clean up contaminated soil. Operation of the remediation system (AS/SVE) was discontinued in March 2000; therefore, there are no O&M activities conducted at this property. Annual groundwater monitoring continues to evaluate residual VOC concentrations in groundwater.

4.3.5 Olympia

As previously discussed, the PRP for the Olympia Site is treating TCE contaminated soil in-situ using chemical oxidation (ISCO) via permanganate injection inside an approximately 180 feet long by 100 feet wide sheet pile enclosure in the FDDA. Additional on-site groundwater monitoring wells were installed and the groundwater monitored to determine the effectiveness of this on-going remedial action.

The following summarizes PRP activities that have taken place during the evaluation period of the third Five-Year Review (GeoInsight, 2008, 2009):

- Permitting
  - Submitted permit application to MWRA to drive sheet pile and continue construction activities related to ISCO treatment cell in the FDDA (October 2004)
  - Received MWRA Approval (October 2004)
- Site Preparation
  - Performed bridge enhancements to facilitate access of sheet pile crane to the FDDA (November 2004)
  - Conducted brush clearing to allow construction of the ISCO treatment cell (November 2004)
- Sheet Pile Installation for Treatment Cell (January 2005)
- Injection Well and Trench Installation
  - Trenched for horizontal wells (January 2005)
  - Drilled for vertical injection wells (January 2005)
  - Conducted initial monitoring well installation (February 2005)
  - Installed additional F- and K-series injection wells
    - F-5, F-6, F-7 (August 2005)
    - K-Series (May 2005)
- Installation of Liquid Permanganate Delivery System
  - Prepared staging area for permanganate storage (May 2005)
- Permanganate ($NaMnO_4$) Injection Events (1,000 gallons of 40 percent $NaMnO_4$ per event)

- 1st Injection: September 1, 2005 (Trenches)
- 2nd Injection: September 15, 2005 (Trenches)
- 3rd Injection: September 29, 2005 (Wells)
- 4th Injection: October 13, 2005 (Trenches)
- 5th Injection: November 3, 2005 (Wells)
- 6th Injection: November 10, 2005 (Trenches)
- 7th Injection: November 22, 2005 (Wells)
- 8th Injection: December 16, 2005 (Wells/Trenches)

- Focused Injection Events (Various Volumes)
  - 9th Injection: September 5, 2007 (Wells) 220 gallons of 40 percent $NaMnO_4$
  - 10th Injection: May 20 to 22, 2008 (Direct Push/Wells/Trenches) 3,200 gallons of 5 percent $NaMnO_4$
  - 11th Injection: October 14 to 17, 2008 (East Side, Direct Push/Trenches) 3,700 gallons of 4 percent $NaMnO_4$
  - 12th Injection: November 10 to 14, 2008 (Direct Push/Trenches) 4,800 gallons of 3 percent $NaMnO_4$
  - 13th Injection: December 8 to 11, 2008 (Direct Push/Trenches) 4,300 gallons of 3 percent $NaMnO_4$
  - 14th Injection: April 20 to 23, 2009 (Direct Push/Trenches) 4,150 gallons of 2-3 percent $NaMnO_4$
  - 15th Injection: May 19 to 22, 2009 (Direct Push/Trenches) 4,775 gallons of 2-3 percent $NaMnO_4$

- Groundwater Monitoring
  - 2005 Baseline comprehensive sampling event (April 2005)
  - Additional focused sampling events
    - September 2005
    - January 2006
    - February 2006
    - March 2006
  - 2006 Comprehensive sampling event (April 2006)
  - Additional focused sampling events
    - July 2006
    - August 2006
    - September 2006
    - October 2006
    - December 2006
    - March 2007
  - 2007 Comprehensive sampling event (April 2007)
  - Focused sampling event (November 2007)
  - 2008 Comprehensive sampling event (April 2008)

- Focused sampling event (August 2008)
- Focused sampling event (November 2008)
- Focused sampling event (December 2008)
- Focused sampling event (March 2009)
- Focused sampling event (April 2009)
- Focused sampling event (May 2009)

- Additional assessment activities included in November 28, 2006 Scope of Work
  - Subsurface Investigation (May 2007)
  - Focused groundwater sampling event (June 2007)

- Additional Assessment Activities included in March 14, 2008 Scope of Work
  - Subsurface investigation activities (June 2008)

5.0 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The following recommendations were made in EPA's second Five-Year Review Report.

- Implement institutional controls at Source Area properties.
- Assess groundwater conditions since treatment shutdown of the NEP system, evaluate the need for further groundwater and soil treatment, and where appropriate consider other treatment options. Install downgradient monitoring well(s) to define downgradient extent of groundwater contamination.
- Replace extraction pump.
- Review soil contamination issues at UniFirst to establish data needs for implementation of technical solutions.
- Assess groundwater conditions south of the Wildwood treatment system, evaluate the need for further groundwater and soil treatment, and where appropriate consider other treatment remedies.
- Develop and implement plan to assess capture in bedrock at Wildwood.
- Evaluate exposures not addressed by Endangerment Assessment using up-to-date groundwater data.
- Assess arsenic and manganese groundwater conditions at appropriate Source Area properties.
- Evaluate risk from exposure to indoor air at the Source Area (OU-1) properties based on up-to-date groundwater data if property is developed.
- Revise National Pollutant Discharge Elimination System (NPDES) equivalent discharge standards as needed based upon current Ambient Water Quality Criteria (AWQCs).
- Evaluate progress of Olympia TCE soil remedy under the AOC removal action. Assess need for groundwater cleanup at end of removal action.

The following protectiveness statement(s) was made in EPA's second Five-Year Review Report.

> "The remedy at the Wells G&H Superfund Site currently protects human health and the environment. However, in order for the remedy to be protective in the long term, institutional controls should be implemented at the Source Area properties to prevent exposure to groundwater and unremediated soil areas until the remedy is completed. Additional treatment and/or measures to ensure capture may be required at some of the Source Area (OU-1) properties. The Endangerment Assessment did not cover all potential exposures to groundwater, and the basis for identifying COCs has changed since implementation of the ROD, which will require additional evaluation to ensure representativeness and future protectiveness. Indoor air vapor intrusion has also emerged as an issue as EPA technical guidance on this matter has evolved. Lastly, AWQCs associated with aquatic life have decreased since the ROD; therefore, the impact of these changes needs to be assessed.

Other Comments: Operable Units 2 (Central Area) and 3 (the Aberjona River Study) have been identified for further study by the PRPs and EPA, respectively. However, a remedy has not yet been selected for the Central Area (OU-2) and Aberjona River Study (OU-3)."

Many of the second Five-Year Review Report's issues and recommendations were not addressed and carry over to this Five-Year Review Report.

Institutional Controls

Institutional controls are not required at the Source Area (OU-1) properties. However, the ROD states that "Once cleanup goals have been satisfied, the extraction wells will be shut down and a monitoring program will be implemented. The results of this monitoring program will be reviewed by EPA in order to evaluate need for any additional site work including the resumption of the Remedy or the implementation of institutional controls, and to provide information for delisting." In addition, the ROD states "... that the state and the City of Woburn implement controls, such as regulations, ordinances, deed and land restrictions, or other effective form of land use control to prevent the use of the aquifer in the vicinity of the Site. Groundwater use should be restricted until it is determined conclusively that cleanup goals have been met."

The ROD also states as one of its objectives, "prevent public contact with contaminated groundwater and soil above the cleanup levels." Although institutional controls were identified as a potential future problem, no activities have taken place to address institutional controls, and controls preventing potential public contact with contaminated groundwater and soil until cleanup levels are achieved should be established at each of the Source Area properties. However, there is no information to indicate that unacceptable exposure to contaminated soil or groundwater is occurring.

NEP Post-Treatment Shut-Down Assessment

While AS/SVE treatment of the source area led to significant reduction in groundwater contaminant concentrations, the persistent presence of PCE in overburden and bedrock groundwater above ROD action levels is inconsistent with EPA's goal of aquifer restoration. In addition, the last time deep bedrock wells were sampled on the NEP property was 1993 and contained elevated levels of COCs.

In May 2009, EPA raised some initial concerns with the NEP property. In August 2009, EPA met with representatives of NEP to begin the process of identifying what data need to be collected to address the remaining concerns on the NEP property.

Replace Extraction Pump at UniFirst

The second Five-Year Review took place during the twelfth year of UniFirst groundwater treatment system operations, and noted that a replacement pump installed in the extraction well at the time of the review was not achieving design capture (based on PRP-derived drawdown objectives) and was potentially undersized.

Since that time, the pump was replaced, adjustments to valve positions were made and the PRP-derived target drawdown elevation was restored. However, the pumping rate with the new pump is less than the target pumping rate of 50 gpm. In addition, soil heterogeneities and inverse horizontal gradients by the UniFirst property suggest insufficient capture.

Soil Remedy at UniFirst

The soil remedy set forth in the ROD has not been implemented by the PRP at the UniFirst Source Area Property.

In 2008, EPA further evaluated the potential vapor intrusion and indoor air risks at the UniFirst Source Area Property based upon soil vapor and soil data collected under and adjacent to the existing building foundation. The results indicate that estimated indoor air concentrations based on the soil vapor data, as well as the soil data, exceed EPA's acceptable risk range, indicating the potential for current unacceptable risk levels within the existing building.

Beyond what is described above, no additional soil characterization has occurred at the UniFirst Source Area Property. In May 2009, EPA raised some initial concerns with the UniFirst property. In August 2009, EPA met with the UniFirst representatives to discuss these concerns including the vapor intrusion pathway. As a result of this meeting, UniFirst will prepare a work plan to gather additional data and further characterize current vapor intrusion conditions in the existing building on the property. EPA will continue to meet with UniFirst representatives regarding remaining concerns with the property.

Evaluation of Area South of Wildwood Treatment System

The area to the south of the Wildwood treatment system may have groundwater contamination in excess of ROD action levels that is not receiving treatment. In addition, further groundwater and soil treatment may be necessary. If so, other treatment methods may have to be evaluated, as appropriate. In May 2009, EPA raised some initial concerns with the Wildwood property. EPA anticipates scheduling meetings with Wildwood representatives in October 2009 regarding these concerns with the property.

Bedrock Capture at Wildwood

The available documentation provided by the PRP for the Wildwood Source Area does not include sufficient information to assess the degree of hydraulic control imparted by the pumping wells in the zones where groundwater extraction takes place. As a result, the second Five-Year Review recommended that a plan be developed and implemented to assess capture in bedrock at Wildwood. In May 2009, EPA raised some initial concerns with the Wildwood property, recommended additional assessment to evaluate the degree of hydraulic control, additional extraction wells and monitoring wells, extraction rate adjustments, and optimization of the treatment system. EPA anticipates scheduling meetings with Wildwood representatives in October 2009 regarding these concerns with the property.

Evaluate Groundwater Exposures Not Addressed by Endangerment Assessment

The 1988 Endangerment Assessment did not comprehensively evaluate non-ingestion uses of groundwater such as dermal contact during industrial groundwater usage or direct contact during trench excavation under certain current (commercial worker) and future (commercial worker, residential) scenarios at Source Area Properties.

The recommended follow-up action was to evaluate exposures not addressed by the Endangerment Assessment using up-to-date groundwater data. However, because of persistent groundwater contamination at each Source Area property in combination with uncertainty regarding the location and magnitude of potential exposures, non-ingestion groundwater exposures should be prevented through the implementation of property-specific controls until the remedy is complete. If non-ingestion groundwater exposures are to occur before the remedy is complete (e.g., excavations that exposure shallow groundwater), personal protective measures should be used or a risk evaluation conducted to determine whether such exposures would be associated with risks and hazards above risk management guidelines, based on current groundwater contaminant concentrations present in the area of interest. The risk management guidelines are EPA's target risk levels (cancer risk less than or within 1E-06 and 1E-04 and noncancer hazards less than target organ Hazard Indices [HI] of 1).

Evaluate Arsenic and Manganese in Groundwater

Manganese was not identified as a COC in Wells G&H OU-1 groundwater under the 1988 Endangerment Assessment. Manganese toxicity values have been reduced by a factor of 10 since the 1988 Endangerment Assessment. A lifetime health advisory value for manganese of 300 micrograms per liter (ug/L) has been used by EPA as an interim groundwater cleanup level on recent sites. Based upon current toxicity estimates, future exposure to manganese in groundwater may exceed safe levels at some of the Source Area properties.

Clean-up standards for groundwater were established as MCLs, which is consistent with the current selection of groundwater clean-up standards in areas that may serve as a potential source of drinking water. All COCs in groundwater, based on the results of the 1988 Endangerment Assessment, were targeted for clean-up, with the exception of arsenic. At that time, groundwater concentrations at the Source Area properties were not considered above the arsenic MCL of 50 ug/L. However, the MCL for arsenic has been reduced to 10 ug/L since 1988. Based upon a current evaluation of arsenic using the current MCL, future exposures to arsenic in groundwater may exceed safe levels at some of the Source Area OU-1 properties.

The recommended follow-up action was to assess groundwater conditions relative to arsenic and manganese at Source Area properties. NEP and Olympia properties collected some arsenic and manganese data from groundwater.

Evaluate Risk from Exposure to Indoor Air

EPA's earlier evaluation of the groundwater to indoor air pathway conducted as part of the second Five-Year Review indicated that potential risks at the UniFirst, Grace, NEP, and

Wildwood properties were within or below EPA risk management guidelines, based on assumed commercial site use. A subsequent evaluation conducted by EPA at the UniFirst property indicates that soil gas samples collected from within 30 feet of the current commercial building and from the waste oil area, located to the northeast of the building, have the potential to pose a current and future risk and hazard above EPA's risk management criteria for the subsurface vapor intrusion (i.e., indoor air) pathway. EPA's review and evaluation of soil data collected from beneath the current building, also indicates potential risk and hazard above regulatory risk management criteria for the indoor air pathway. However, the age of the PRP data on which the evaluations were based, the use of fate and transport modeling, and uncertainty associated with toxicity values and exposure point concentrations all contribute uncertainty to the evaluation, which may result in either an over- or underestimation of the risk and hazard.

Revise NPDES Discharge Standards

AWQCs associated with aquatic life have decreased since the ROD. AWQCs were used, in part, to establish effluent limits for remedial system discharges.

The recommended follow-up action was to revise NPDES equivalent discharge standards based upon current AWQCs since the pump and treat remedial systems discharge to surface water bodies (Aberjona River, Snyder Creek). The discharge limits have not yet been revised to reflect the current AWQC. This affects the UniFirst and Grace treatment systems only, because they have surface water discharges, whereas Wildwood discharges to the MWRA sewer line in Salem Street.

Evaluate Progress of Olympia Remedy

At the time of the second Five-Year Review, a groundwater remedy at Olympia had not been implemented. The Olympia TCE ISCO soil cleanup has since been implemented. The goal of this removal action is to achieve groundwater cleanup goals (i.e., MCLs, and ROD-specified soil cleanup goals).

In-situ chemical oxidation (via permanganate) was implemented by the PRP in 2004 as a removal action for the FDDA portion of the Olympia Property. The major components of the removal action include:

- A sheet pile wall installed to a depth of approximately 15 feet around the perimeter of the FDDA (an area approximately 180 feet long and 100 feet wide);
- Delivery of permanganate to the silt unit via a multi-depth injection network;
- Multiple applications of oxidant via gravity drainage; and
- Monitoring of groundwater conditions within the FDDA via a network of nested monitoring wells and discrete geoprobe water samples.

The sheet pile wall was used to contain impacted groundwater, thereby limiting continued impacts to the Wells G&H aquifer, and to help ensure that oxidant is retained within the area of remedial focus.

The PRP implements permanganate injections within the boundaries of a driven sheet pile cell. Monitoring is conducted during implementation of the removal action to evaluate:

- Migration of permanganate solution outside the sheet piled area;
- Significant changes in the oxidation state of the aquifer;
- Generation of daughter products of the breakdown of PCE and TCE; and
- Changes in concentrations of sodium, chloride, and manganese in the aquifer and wetland.

The effectiveness of this removal action within the FDDA is currently being evaluated by monitoring groundwater quality.

Treatment activities and EPA oversight are on-going at the Olympia Site.

6.0 FIVE-YEAR REVIEW PROCESS

This section describes the activities performed during the Five-Year Review process and provides a summary of findings. The Wells G&H Five-Year Review team was led by EPA's Remedial Project Manager (RPM) for the Site, Joseph F. LeMay, PE. The team included staff from TRC Environmental Corporation (TRC) and AECOM (formerly M&E).

6.1 Community Notification and Involvement

EPA issued a press release on June 24, 2009, announcing its review of the progress of the Wells G&H Superfund site. Over the last five years, community interest in the site has been centered on contamination in the Aberjona River (OU-3) and reuse of the Wells G&H site. Public involvement/interest in the Source Area (OU-1) remedies has been limited. There is no community support for using the Wells G&H aquifer as a public water supply, although the Woburn city government has expressed an interest in having the source available for the future. Interviews for this Five-Year Review with various members of the local government and community were conducted throughout the month of June 2009. Local community members and local governmental representatives interviewed, their affiliation, and the date of the interview are summarized below:

Interviewee	Affiliation	Date of Interview
Thomas McLaughlin	Mayor of Woburn	July 9, 2009
Jay Corey	Woburn City Engineer	June 10, 2009
Jack Fralick	Woburn Board of Health	June 4, 2009
Michael Raymond	Woburn Alderman	July 12, 2009
Donna Robbins	Woburn Resident	July 15, 2009
Linda Raymond	Aberjona River Study Coalition, Inc.	July 12, 2009
Kathleen Barry	Aberjona River Study Coalition, Inc.	July 14, 2009

The results of these and other interviews are summarized in Section 6.5.

Since the last Five-Year Review, EPA has issued several fact sheets and press releases regarding site progress. Public presentations have also been conducted regarding the Aberjona River Study (OU-3), which is now part of the Industri-Plex Superfund Site.

In addition, a copy of this Five-Year Review will be placed in the information repository in the Woburn Public Library and posted on the Wells G&H website.

6.2 Document Review

The document review for the Wells G&H Five-Year Review included the documents listed below:

- Record of Decision (September 14, 1989)
- Consent Decree, Civil Action No. 91-11807MA and RD/RA SOW
- Explanation of Significant Difference (April 25, 1991)
- Five-Year Review Report (Type 1A), Wells G&H Superfund Site (August 4, 1999)
- Clarification of the August 1999 Five-Year Review for the Wells G&H Site (December 2001)
- Latest Annual Performance Evaluation and Source Control Reports for the Source Area (OU-1) properties
  - Grace Remedial Action, Annual Report, November 13, 2008
  - RD/RA Year 16 Annual Report for the UniFirst Site, November 12, 2008
  - Annual Report, Integrated Subsurface Treatment System, Wildwood Property, April 17, 2008
  - Groundwater Monitoring Report, New England Plastics Corporation, October 6, 2008
- Last 6 months of Monthly Operations Reports for the Source Area properties
- Approved source area environmental monitoring plans
- Public Health Assessment Addendum, Wells G&H, Woburn, Middlesex County, Massachusetts, CERCLIS No. MAD980732168. Prepared by U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry. December 20, 1995.
- Letter Report. RE: Residential Indoor Air Sampling Results: Dewey Avenue Neighborhood, Wells G&H Superfund Site. Prepared by ENSR. July 21, 1989.
- Endangerment Assessment for the Wells G&H Site, Woburn, Massachusetts. Prepared for EBASCO Services, Incorporated, Lyndhurst, New Jersey. Prepared by: Clement Associates, Fairfax, Virginia. December 1988.
- 2003 Olympia Nominee Trust AOC for the removal of PCBs and further TCE investigations
- 2004 Olympia Nominee Trust AOC for the treatment of TCE contaminated soils

- Revised Work Plan, Removal Action, 60 Olympia Avenue, Woburn, Massachusetts, January 28, 2004

- Memorandum. Review of PRP Soil and Soil Gas Data at UniFirst Property. Prepared by Metcalf & Eddy. February 29, 2008

Additional documents and information sources used in the preparation of this report are listed in Attachment 3.

6.3 Data Review

Groundwater monitoring has been performed for a number of years at each of the Source Area properties as well as other sampling. Specific dates when sampling was initiated and sample collection frequencies vary for each of these properties.

The discussions below summarize the results of groundwater monitoring being conducted at the respective Source Area properties and the results of soil and sediment sampling, where applicable. The evaluations of the groundwater monitoring database for each property consider the overall concentration trends of the COCs since the initiation of remedial activities as well as current trends in concentrations over the last five years of data collection.

Grace

Groundwater is the only environmental media subjected to regular monitoring at the Grace property, although some soil sampling was conducted by the PRP as part of the building demolition and as part of due diligence activities conducted by others associated with a potential Site redevelopment opportunity. The groundwater monitoring program formerly consisted of annual sampling and analysis of groundwater from 10 monitoring wells and eight pumping wells (GeoTrans, 2002). Subsequent to the submission and EPA approval of a revised Long Term Monitoring (LTM) Plan on April 11, 2004, the groundwater monitoring program now consists of annual sampling and chemical analysis of groundwater from 12 monitoring wells and 6 pumping wells.

The available database shows that overall concentrations of VOCs in groundwater appear to be decreasing at the Grace property. Of the 12 monitoring wells currently included in the sampling program, VOC concentrations have dropped significantly since the initiation of groundwater extraction in 1992. Nonetheless, since the second Five-Year Review in 2004, groundwater contaminant concentrations in excess of ROD action levels have been observed in four of the 12 wells currently being monitored. In general, monitoring wells in which contaminant concentrations in excess of ROD action levels have been detected over this Five-Year Review period, both routinely monitored and other, include: G1DB, G1DB3, G3D, G3DB, G4D, G11D, G13D, G15D, G16D, G19M, G19D, G20S, G20M, G20D, G22D, G23D, G24S, G24D, G28S, G28D, G34D, G35DB, G36DB, G36DB2.

Since the second Five-Year Review in 2004, TCE was detected in each of 21 wells at concentrations above the TCE action levels of 5 ug/L. Detected maximum concentrations of TCE during this review period vary over time and from monitoring well to monitoring well, and range from approximately 5.4 ug/L (G11D) to 510 ug/L (G19D). These data also show that PCE has been detected above or equal to its respective ROD action level of 5 ug/L in five wells over the reporting period at concentrations ranging from approximately 5.7 to 36 ug/L.

Groundwater from the six routinely monitored pumping wells at Grace (RW-10, RW-12, RW-13, RW-17, RW-20, and RW-22) has been found to contain TCE (5 out of 6 wells) and PCE (5 out of 6 wells) above ROD action levels. During this review period, the PRP sampled additional pumping wells. The highest VOC concentrations detected at the site have been encountered in groundwater from pumping well RW-22. Detections of TCE in well RW-22 have been encountered as high as 220 ug/L during this review period. Detections of 1,2-DCE have also been encountered in RW-22 groundwater as high as 730 ug/L. In addition, other pumping wells have been sampled by the PRP during the reporting period, including RW-7, RW-8, RW-9, RW-11, RW-14, RW-15, RW-16, RW-18, RW-19, and RW-21, all of which were sampled in 2007. TCE was detected in seven of these recovery wells over the ROD action level of 5 ug/L at concentrations ranging from 6.5 ug/L (RW-16) to 17 ug/L (RW-11 and RW-19). PCE was also detected above the ROD action level of 5 ug/L in 8 of the wells at concentrations ranging from 6.1 ug/L (RW-15) to 38 ug/L (RW-14 and RW-16).

Samples collected from the shallower monitoring wells at the Grace property have been found to be nondetect for the COCs or have had concentrations below clean-up criteria. Deeper contaminated groundwater emanating from the Grace property is reported to be captured by the deeper groundwater recovery system operated at the UniFirst property. No groundwater samples were collected and analyzed for arsenic and manganese at the Grace property.

GeoTrans et al. (2008) calculated the mass of VOCs removed from the subsurface for September 4, 2007 through September 2, 2008. The calculated total mass removed in that period was 1.4 pounds. The calculation was based on influent concentrations of detected VOCs and the total volume of groundwater treated during that period. Values reported as below the detection limit were assumed to be zero in all calculations consistent with prior similar calculations for this Site.

The estimated total mass of VOCs that was removed from groundwater beneath the Grace property during the 16 years of operation is 82.3 pounds. Approximately 3.69 million gallons of water were pumped during the sixteenth year. The recovery wells flow rates during this time period ranged from 3.46 gallons per minute (gpm) to 11.24 gpm, averaging approximately 7.44 gpm. Total gallons pumped over the 5-year period is 20.1 million gallons. The total gallons pumped since startup is 57.9 million gallons.

Soil and sediment sampling was conducted by the PRP in April 2005 as part of the building demolition and as part of due diligence activities conducted by others associated with a potential Site re-development opportunity. A total of 28 surface soil samples (collected within the top three feet of ground surface) and 15 subsurface soil samples (collected at depths up to 20 feet below ground surface) were collected by the PRPs. An additional 22 soil samples (7 surface and 15 subsurface) were collected by Environmental Compliance Services, Incorporated (ECS) as

part of due diligence activities. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), PCBs, pesticides, and metals. The soil sampling results indicated concentrations of TCE, PCE, PCBs and PAHs exceeding ROD action levels at one or more locations. Total carcinogenic PAHs exceeded the action level by more than 30-fold, PCB and TCE action levels were exceeded by more than 20-fold, and the PCE action levels were exceeded by approximately 3-fold. These results indicate the presence of localized areas of hot spot soils requiring further investigation. ECS also collected 2 sediment samples. The sediment samples displayed non-detect levels of VOCs, PCBs and pesticides, and low levels of PAHs and metals, likely representative of ambient conditions associated with urban runoff or anthropogenic sources.

UniFirst

Groundwater is the only environmental media subjected to regular monitoring by the PRP at the UniFirst property. The groundwater monitoring program at the UniFirst property currently includes sampling of 24 wells and subsequent chemical analysis for VOCs. Over the years since active groundwater pumping has been conducted, variations to the list of wells included in the sampling program have been implemented. There is only one groundwater extraction well operated on the UniFirst property, UC22. The PRPs states that hydraulic capture is achieved for the overburden and bedrock aquifers from pumping approximately 40 gpm from this well, although as described elsewhere in this third Five-Year Review, EPA has expressed concern with the performance claims for capture at UniFirst.

A review of the data available prior to and since startup of active groundwater pumping shows that for a number of the wells monitored, contaminant concentrations have not changed significantly. Examples include wells UC7-1 and UC7-2, which had total VOC concentrations of approximately 2,500 ug/L in 1991 and total VOC concentrations of 2,471 ug/L and 3,051 ug/L, respectively in 2008. Other wells which do not appear to show a significant decrease in contaminant concentrations include or have shown concentration increases, UC10-1 through UC10-5, UC11-2, and UC7-5. In locations where decreasing contaminant concentrations have been encountered, concentrations generally remain above clean-up criteria.

Shallow groundwater within the unconsolidated deposits appears to contain lower concentrations of the COCs than deeper groundwater located within the bedrock. For example, shallow wells UC10S, UC10M, UC10D, and S70M have had non-detectable concentrations of the COCs repeatedly over several rounds of sampling. It should be noted that these wells also had non-detectable concentrations for these compounds during their respective earliest sampling events. No groundwater samples were collected and analyzed for arsenic and manganese at the UniFirst property.

HPS (2008) calculated the total mass of contaminant removed using the average of the influent concentrations of the contaminants and monthly flows from extraction well UC-22. Approximately 40.5 pounds of PCE and 2.8 pounds of TCE were removed during the sixteenth operational year. During the sixteenth operational year, approximately 21.3 million gallons of groundwater were extracted from UC-22. The total gallons pumped over the review period is 95.7 million gallons. Approximately 0.27 pounds of 1,1,1-TCA, 0.40 pounds of 1,2-DCE, and

0.18 pounds of 1,1-DCE also were removed from the subsurface by the extraction and treatment system. Approximately 2,037 pounds of PCE and 98.3 pounds of TCE have been removed during the sixteen years of operation. Currently, UniFirst has not designed or implemented the soil remedy on their property.

New England Plastics

NEP operated the AS/SVE source control remedy from February 2, 1998 to March 7, 2000. Since the shutdown of the remedial system at NEP, ongoing groundwater monitoring is being performed to evaluate trends in contaminant concentrations. Operation of the AS/SVE system reduced concentrations of the COCs detected in site groundwater significantly, with maximum concentrations of total chlorinated VOCs detected in overburden well NEP-101 being reduced from 5,406 ug/L in 1994 to a range of 5 ug/L to 12 ug/L since the second Five-Year review in 2004. Concentration reductions have also been noted in groundwater within the PRP's routinely monitored bedrock well network.

Although significant reductions of groundwater contaminant concentrations have been achieved, exceedances of ROD action levels remain in the current monitoring network at the NEP Source Area Property. The predominant chlorinated VOC in groundwater at the NEP property is PCE (ROD action level of 5 ug/L).

Additionally, a review of historic concentrations of total chlorinated VOCs in groundwater, as presented in Figures 1 and 2 of the annual Groundwater Monitoring Report (Woodard & Curran, 2008) shows the decreases experienced were noted with the startup of the AS/SVE system. Contaminant concentrations since then appear to have stabilized. No significant increasing trend is noted to have occurred since turning off the AS/SVE system. In the most recent round of groundwater monitoring, PCE was detected in excess of the ROD cleanup level in NEP-101 (10 ug/L) and NEP-106B (14 ug/L). Based upon the review of this data, EPA is concerned about potential off-site migration in groundwater toward nearby residences and the lack of recent data regarding contaminant concentrations in deeper bedrock.

Groundwater samples were collected and analyzed for arsenic and manganese at the NEP property. Based upon the review of this data, EPA is not concerned with an exceedance of the arsenic MCL or the manganese health advisory at the NEP property.

Contaminant mass removal estimates are not included in NEP annual reporting since active remedial systems are currently shut down.

Wildwood

The Wildwood remediation system uses a combination of air sparging and soil vapor extraction (AS/SVE) and groundwater extraction. The AS/SVE currently operates in three cycles during a 24 hour period. The first cycle operates only the southern-half of the AS/SVE system (8 hours/day); the second cycle operates only the northern-half of the AS/SVE system (8 hours/day); and during the third cycle, the AS/SVE is shut down/not operating (8 hours/day). During operations, the vapor stream enters the treatment facility where moisture is removed at

the air water separator and the liquid directed to the influent equalization tank. Additional vapor from the tray air stripper is added to the vapor stream. The vapor stream continues to two 1,500-pound vapor-phase GAC treatment vessels (in series) and then released to the atmosphere. The vapor-phase GAC vessels are changed approximately once per year.

Groundwater is extracted from various recovery wells and combined within the treatment system at an equalization tank. The water stream continues to a tray air stripper, where stripped VOCs are directed to the vapor stream treatment train. The water stream continues through a sand filter and 2,800-pound GAC vessels. Treated water is discharged to a MWRA sewer line situated within Salem Street.

With an active AS/SVE system on-site, ongoing environmental monitoring at the Wildwood property includes both the groundwater and activities to evaluate potential vapor migration outside of the treatment area on-site. Groundwater quality is monitored in the overburden to evaluate the effectiveness of the treatment zone created by the AS/SVE system, as well as from the shallow and deeper bedrock to evaluate the impacts of groundwater extraction activities. The potential for vapor migration beyond the engineered cover and SVE systems is performed at specified points over the treatment zone created by the AS/SVE system.

Groundwater monitoring activities include quarterly sampling and analysis from 13 wells and annual sampling and analysis from 23 wells. Well locations monitored include extraction wells and monitoring wells located both within the AS/SVE treatment zone and outside of the treatment zone. Review of the groundwater quality data shows no clear trend in contaminant concentrations across the site. At some well locations, concentrations have increased beyond their baseline conditions; at other locations, concentrations have both increased and decreased over time. No groundwater samples were collected and analyzed for arsenic and manganese at the Wildwood property.

Contaminant concentrations in excess of ROD action levels for groundwater persists at most monitoring well locations and within the different aquifer zones (i.e., shallow and intermediate overburden, till, shallow bedrock and deeper bedrock). The overall predominant contaminant detected in overburden groundwater is TCE. Within the deeper bedrock zone a larger set of contaminants have been detected at elevated concentrations, including chloroform and 1,1,1-TCA (both detected at varying concentrations of in excess of 100 ug/L in well BW-18RD(LO) within the evaluation period of the third Five-Year Review). While the deeper bedrock zone contains the highest concentrations of contaminants, only two wells screened within the deep bedrock are included in the monitoring program, one of which is an extraction well.

The most recent annual report for Wildwood prepared by RETEC documents performance of the remedy through Year Nine. ENSR (2008) determined the quantity of total VOCs removed from the groundwater and vapor extraction systems based on totalized volumes for the vapor and liquid process streams and contaminant concentrations for these streams. The average monthly composite air sparging system flow rate for Year Nine ranged from 91 standard cubic feet per minute (scfm) to 175 scfm. The overall average monthly flow rate was 114 scfm for Year Nine. The total volume of injected air for Year Five was 32.8 million cubic feet, which corresponds to an average monthly air injection volume of approximately 2.7 million cubic feet.

The vapor extraction system network operated at a combined average flow rate of 189 scfm for Year Nine. The total volume of vapor extracted during Year Five was 82.3 million cubic feet.

Air stripper off-gas flow rates ranged from 213 scfm to 260 scfm during Year Nine operations. The average monthly rate was 241 scfm. The total volume of air used to treat groundwater within the air stripper was approximately 108 million cubic feet.

Vapor phase activated carbon filters receive combined influent air from the vapor extraction system and the air stripper. The average monthly flow rate at the activated carbon filter influent was 413 scfm for Year Nine operations, with a range from 401 scfm to 450 scfm. The total volume of air that passed through the vapor phase carbon at the site for Year Nine was 189 million cubic feet, which is the sum of the air stripper off-gas and the SVE system flow.

The treatment system influent includes groundwater pumped from the five bedrock extraction wells and periodic batch flows of water collected in the two air-water separators on the SVE system. The total volume of water treated between May 2006 and end of April 2007 was 11.8 million gallons.

Water run through the treatment system is composed of the influent from the subsurface treatment system and water generated by plant operations, sampling, and routine maintenance. Both streams are run through the air stripper prior to discharge. The operation sources include backwash water from the sand filter and the two carbon vessels, and water from the acid-gas scrubber (when the catox unit was in operation). Water generated from general decontamination operations is also collected by the floor drains and transferred into the system for treatment. The total volume of system effluent for Year Five operations was 11.6 to 11.8 million gallons.

ENSR (2008) calculations used to estimate mass removal for the groundwater treatment system assume that the total VOCs are comprised entirely of TCE. Mass removal estimates for groundwater are based on laboratory data combined with the totalized influent flow reading collected at the treatment building. The total calculated mass of VOCs removed from groundwater during Year Nine operations was 20.4 pounds of VOCs, bringing the nine-year total to approximately 193 pounds of VOCs removed.

Mass removal estimates for the SVE system are based on laboratory analytical sampling to determine influent and effluent air concentrations converted to parts per million-volume (ppm(v)) for comparison purposes assuming all detected VOCs comprised of TCE. The calculated total mass of VOCs removed by the SVE system was 39 pounds for Year Nine operations. The total amount of VOCs removed by the SVE system since system startup is approximately 2,201 pounds.

Olympia

In Spring 2003, EPA reached an agreement with Olympia through an AOC to continue the cleanup of contaminated soils on the Olympia property. Under the AOC, Olympia excavated and disposed of 56 cubic yards of PCB-contaminated surface soils, and approximately 5 cubic

yards of PAH-contaminated soil (called for in the ROD), evaluated various options for addressing the TCE-contaminated soils, and prepared a detailed work plan for cleaning up the TCE by way of in-situ sodium permanganate injection treatment. In June 2004, EPA approved the TCE Work Plan and reached an agreement in a second AOC with Olympia to implement the work.

The major components of the Olympia ISCO removal action include:

- A sheet pile wall installed to a depth of approximately 15 feet around the perimeter of the FDDA (an area approximately 180 feet long and 100 feet wide used to contain impacted groundwater, thereby limiting continued impacts to the Wells G&H aquifer, and to help ensure that oxidant is retained within the area of remedial focus);
- Delivery of permanganate to the silt unit via a multi-depth injection network;
- Multiple applications of oxidant via gravity drainage; and
- Monitoring of groundwater conditions within the FDDA via a network of nested monitoring wells and discrete geoprobe water samples.

Cleanup of the TCE contaminated soils is currently underway and is closely monitored by EPA. In 2008, the oxidant delivery approach was enhanced with geoprobes (direct push technology) to improve oxidant distribution. Since the Fall 2008, the monitoring and injection approach for the FDDA includes 3 month cycles where injections occur from October – December and April – June, while monitoring/evaluation occur from January- March and July-September. This approach is consistent with the revised work plan dated October 2008.

The effectiveness of the cleanup within the FDDA is evaluated by monitoring groundwater quality. Groundwater samples are collected from new and existing monitoring wells and by direct, depth-discrete groundwater sampling using a geoprobe. The sampling program includes groundwater samples collected from multiple locations and depths that are representative of the different stratigraphic units within the FDDA monitored over multiple events and time periods.

Of the 68 wells sampled as part of the April 2005 baseline monitoring performed by the PRP prior to initiation of ISCO treatment, 38 had concentrations of PCE and/or TCE, and some cases associated daughter products, in excess of ROD action levels for groundwater. Based on the most recent rounds of groundwater monitoring available for those wells (see GeoInsight, 2009), seven of the 68 wells monitored as part of the April 2005 baseline have PCE/TCE related contaminant concentrations detected in excess of ROD action levels. Three of these wells have shown increases in contaminant concentrations since injections were initiated. Oxidant delivery and monitoring will continue until the cleanup objectives are achieved.

Groundwater samples were collected and analyzed for arsenic and manganese at the Olympia property. Based upon the review of this data, EPA is concerned with some exceedances of the arsenic MCL and the manganese health advisory at Olympia. Additional data should be collected and evaluated, and where appropriate cleanup should be revised goals at the Olympia property.

Data Review Summary

Remedial or removal actions to address the Source Area properties have been conducted on the five Source Area Properties. Based on a review of the analytical groundwater generated to date, COCs persist in groundwater at the Source Area properties at concentrations exceeding ROD action levels, insufficient capture remains a concern at UniFirst, Grace and Wildwood properties, and vapor intrusion pathways are a potential concern at the UniFirst property and downgradient/near UniFirst, Grace and NEP properties. In addition, no soil remedy has been implemented at the UniFirst property, soil contaminants above ROD action levels have been found at the Grace property, and arsenic and manganese groundwater data need to be collected from UniFirst, Grace, Wildwood and Olympia properties.

6.4 Site Inspection

Representatives of AECOM (formerly M&E) and TRC, in conjunction with source area contractor interviews, conducted site inspections of the Source Area (OU-1) properties between June 11 and June 17, 2009 (Grace, UniFirst, and NEP) and EPA conducted a Site inspection of Wildwood on June 12, 2009. The purpose of the inspections was to help assess the protectiveness of the remedy by observing the condition of the site access controls, and the remediation systems. A site inspection of the Olympia site was not conducted. However, EPA has a periodic presence at Olympia to oversee response actions conducted under recent AOCs. The status of site actions/activities relative to the AOCs is reported elsewhere in this Five-Year Review.

The following source area representatives participated during the site inspections:

Timothy Cosgrave with Harvard Project Services, LLC, was present during the Five-Year Review site visit of the UniFirst property conducted by M&E and TRC personnel on June 11, 2009;

Maryellen Johns, Senior Project Engineer, with The Remedium Group was present during the Five-Year Review site visit of the Grace property conducted by M&E and TRC personnel on June 16, 2009;

Jeffrey Hamel, Project Manager with Woodard & Curran, Incorporated, was present during the Five-Year Review site visit of the NEP property conducted by M&E and TRC personnel on June 17, 2009; and

Peter Cox, Project Manager and **Brandan Maye**, plant manager, with AECOM (formerly ENSR) were present during the Five-Year Review site visit of the Wildwood Property conducted by EPA personnel on June 12, 2009.

Site inspection checklists or memoranda are included in Attachment 4. Site inspection photographs are included in Attachment 5. Any concerns raised during the site inspections (as well as concerns raised during interviews - see Section 6.5) that do not relate to the

protectiveness of the remedy (e.g., operation and maintenance of the source area treatment facilities, OU-2, or OU-3), will not be reported as issues under the Five Year Review. Instead, EPA will identify all potential concerns raised relative to operation and maintenance and OU-2 to the PRPs, and require these concerns be adequately addressed. Any concerns raised relative to OU-3 will be evaluated and addressed by EPA as part of the review cycle for the Industri-Plex Superfund Site.

6.5 Interviews

Interviews were conducted for the Five-Year Review consistent with OSWER Directive 9355.7-03B-P *Comprehensive Five-Year Review Guidance*, June 2001 (EPA, 2001a).

Interviews were conducted via telephone to the extent practicable with representatives of MassDEP, PRP consultants and representatives, Woburn city government officials, and the local community, including representatives of local environmental groups. The interviews associated with PRP consultants for Grace, UniFirst, NEP, and Wildwood were performed in conjunction with site visits to the Source Area properties. Representatives of M&E and TRC conducted all interviews on behalf of EPA, with the exception of the Wildwood site which was inspected by EPA. The individuals interviewed, their affiliation, date of interviews, and interview types (i.e., in person, telephone, during site visit) are summarized in Table 2. Interview records are provided in Attachment 6. Any concerns raised during interviews (as well as concerns raised during inspections) that do not relate to the protectiveness of the remedy (e.g., operations and maintenance of the source area treatment facilities, OU-2, or OU-3), will not be reported as issues under the Five Year Review (e.g., Section 8.0). Instead, EPA will separately identify all potential concerns raised relative to operation and maintenance and OU-2 to the PRPs, and require these concerns be adequately addressed. Any concerns raised relative to the OU-3 will be addressed by EPA as part of the Five-Year Review for the Industri-Plex Superfund Site.

Table 2: Summary of Interviewees, Affiliations, and Interview Dates and Types

Interviewee	Affiliation	Interview Date	Interview Type
Timothy Cosgrave	Harvard Project Services – UniFirst Contractor	June 11, 2009	During site visit
Maryellen Johns	The Remedium Group – Grace Contractor	June 16, 2009	During site visit
Jeffrey Hamel	Woodard & Curran, Inc. – NEP Contractor	June 17, 2009	During site visit
Jay Corey	Woburn City Engineer	June 10, 2009	Telephone
Jennifer McWeeney	MassDEP Project Manager for the Wells G&H Site	June 11, 2009	Telephone
Thomas McLaughlin	Mayor – City of Woburn	July 9, 2009	Telephone
Jack Fralick	Woburn Board of Health	June 4, 2009	Telephone
Michael Raymond	Woburn Alderman	July 12, 2009	E-mail
Donna Robbins	Woburn Resident	July 15, 2009	E-mail
Linda Raymond	Aberjona River Study Coalition, Inc.	July 12, 2009	E-mail
Kathleen Barry	Aberjona River Study Coalition, Inc.	July 14, 2009	E-mail

The following summarizes key information obtained during the interviews. The summaries are grouped by State/Local Government and Community, and by PRP Consultants. The summary does not provide a complete recitation of the interviews. For a detailed accounting of the interviews with each individual or group, refer to the Interview records provided in Attachment 6.

6.5.1 Summary of State/Local Government and Community Interviews

Overall Impression of the Project

The overall opinion expressed by the government officials and community representatives interviewed was that the project related to the Aberjona River is moving too slowly. Kathleen Barry, from the Aberjona River Study Coalition, stated that:

> "It is disconcerting to realize that this process will be extended further as the PRPs study the effectiveness of the EPA proposed remediation at the Halls Brook Holding Area. I agree that this analysis is important as questions have arisen about the proposed plan's veracity and proven effectiveness. I can't help but wonder that once this remediation gets underway there then may be another more effective technology available."

Jennifer McWeeney, of MassDEP, expressed concern for potential indoor air issues to be evaluated and acted on rapidly.

Availability of Information/Communication

The government officials (Mayor, City Engineer, Health Agent, and MassDEP) felt that they were well informed and had good access to information on the project. It was suggested that regular conference calls with the EPA, MassDEP, and PRPs would be helpful as work picks up in the near future.

The community representatives (Michael Raymond, Linda Raymond, Kathleen Barry, and Donna Robbins) on the other hand felt that more information should be made available to the public. It was suggested that the Aberjona River Study Coalition and the public cable stations should be better utilized to disperse information to the public. The interviewees mentioned that the public presentation by the EPA to the City Council should have been advertised better.

Public Perception/Stigma

The government officials interviewed stated that the public perception has been improving for the Site. The demolition of the buildings at the Grace Site has helped public perception.

The community representatives do not believe that public perception of the Site is changing at all. Kathleen Barry stated that "a general sentiment is that the site will never be cleaned up." It was mentioned that EPA should work closely with the State (MassDEP) to assure a complete and comprehensive understanding of the Aberjona River Basin specifically, the Olin Superfund Site. Other items of concern included the building of the ice rink in the flood plain, contaminated soils in the wetland areas, and lead contamination at the Rifle Range.

Future Water Supply Use of Wells G and H

The government officials and community representatives interviewed stated that there is not and should not be any planned future use for Wells G&H.

6.5.2 Summary of PRP Consultant Interviews (UniFirst, Grace, and NEP)

Overall Impression/General Sentiment

The PRP or their representatives reported that the systems are functioning as they are required to by the ROD. There was interest expressed in decreasing the pumping rates/wells at Grace and decreasing the frequency of sampling at NEP.

O&M Presence

The PRP or their representatives reported that the treatment systems at Grace and UniFirst get weekly checks and monthly monitoring.

At Wildwood, the most common problem associated with treatment system shutdown is electrical surges. Several years ago the utility company installed a new transformer along Salem street, which improved the surge conditions and reduced the number of shutdowns. However, surges continue occurring approximately once a month and causing the treatment system to temporarily shut down. The operator of the facility lives nearby and usually gets the facility restarted within two to three hours.

Changes to Remedial Systems

The PRPs or their representatives reported that there have been no changes to the remedial systems within the last five years.

O&M Difficulties

The PRPs or their representatives reported that there were no significant O&M difficulties within the last five years.

O&M Optimization

The PRPs or their representatives reported that there have not been any O&M optimization requirements within the last five years.

Suggestions

Grace reported that they would like to conduct a shutdown test on the southwest pumping wells and the NEP representative expressed interest in decreasing the frequency or number of wells monitored at the Site. Representatives of UniFirst made no suggestions.

Clean-up Progress/Contaminant Changes

The PRPs or their representatives reported that there is continuing clean-up in contaminant concentrations and that there have been no changes in the contaminants.

Presence of Light Non-Aqueous Phase Liquid (LNAPL)/Dense Non-Aqueous Phase Liquid (DNAPL)

The PRPs or their representatives reported that NAPL has not been observed in any of the monitoring wells. The UniFirst representative reported that one monitoring well, UC7, has concentrations indicative of DNAPL.

Changes in Pumping Rates

The PRPs or their representatives reported no changes in the pumping rates within the last five years.

Projections for Achieving Clean-up

The representative for UniFirst reported that the goal of the ROD for the Site is to ensure that the contamination is contained on site and that cleanup is not the primary goal.

Grace reported that the southwest portion of the Site is close or at MCLs and that they would like to conduct a shutdown test in that area to monitor the effectiveness of the treatment.

The representative for NEP reported that it appears that the concentrations at the Site will decrease below ROD levels within the next five years.

Potential Off-Site Contaminant and Hydraulic Impacts

The PRPs or their representatives reported no impact from off-site contaminants or pumping except for where it is specifically designed. The UniFirst pumping well (UC22) helps contain contaminants in the deep aquifer for Grace.

Seasonal Effects/Impacts on Remedial Systems

The PRPs or their representatives reported that there are no significant seasonal effects on the remedial systems.

Remaining Surficial Soil Contamination

The PRPs or their representatives reported no surficial soil contamination except for three PCB soils samples above the ROD action level, within the perimeter of the old building at Grace.

Changes in Site Ownership

The PRPs or their representatives reported there were no changes in ownership for the Source Control properties within the last five years.

Institutional Controls

The PRPs or their representatives reported there were no institutional controls enacted at the Site within the last five years.

7.0 TECHNICAL ASSESSMENT

This section discusses the technical assessment of the remedy and provides answers to the three questions posed in the EPA Guidance (EPA, 2001a).

7.1 *Question A*: Is the remedy functioning as intended by the decision documents?

Yes. The remedy at OU-1 is expected to be protective of human health and the environment upon completion. Even though the Source Area (OU-1) properties have not identified how current groundwater and/or soil exposures are controlled on their properties, there are no known current uses of groundwater or current activities that result in exposure to surface or subsurface soils and groundwater. However, the absence of controls may affect future protectiveness if someone were to conduct intrusive activities on the properties and come in contact with contaminated soil or groundwater, or someone were to install a well and use it in a manner that would be associated with a risk to human health. Although the need for additional site work such as permanent institutional controls are to be evaluated during Source Area closure, some form of property specific controls may be applicable in advance of closure to address intrusive activities on Source Area properties that could expose contaminated soils or groundwater on the property until the remedy is complete.

Potential limitations have been identified with respect to the documentation of an adequate degree of hydraulic control and groundwater contamination capture being achieved at some of the Source Area properties (as previously described) and while groundwater contaminant levels have been substantially reduced, persistent groundwater contamination remains beneath all Source Area properties. Soil contamination has not yet been addressed on the UniFirst property. In addition, a groundwater pump and treat system has not yet been implemented on the Olympia property. However, significant cleanup work is being done as a removal action to address soil and groundwater contamination. Groundwater contamination south of the Wildwood property may need additional treatment. Finally, further evaluation of the NEP groundwater is needed and additional assessment of the groundwater including the deep bedrock is necessary.

7.2 *Question B*: Are the exposure assumptions, toxicity data, clean-up levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

No. The exposure assumptions have changed (were not previously evaluated) for subsurface vapor intrusion, soil contamination on the Grace property and direct groundwater exposure (e.g., excavation activities).

The vapor intrusion pathway at the UniFirst property may pose a current risk above EPA's risk management guidelines to workers within the existing occupied building. The risk management guidelines are EPA's target risk levels (cancer risk less than or within 1E-06 and 1E-04 and noncancer hazards less than target organ HIs of 1). Vapor intrusion may also be an issue downgradient of the UniFirst, Grace and NEP properties. Because of uncertainty regarding the vapor intrusion pathway, it is not known whether or not vapor intrusion could result in unacceptable exposure should any of the Source Area properties be developed/redeveloped.

In addition, toxicity values have changed for tetrachloroethene, arsenic and manganese. AWQC associated with aquatic life have decreased since the ROD, and NPDES equivalent discharge standards at the UniFirst and Grace properties should be evaluated and, as appropriate, revised. Arsenic and manganese groundwater data should be collected at UniFirst, Grace, Wildwood and Olympia properties. Finally, although the ROD indicated that there was no soil contamination above cleanup goals on the Grace property, recent data indicate that soil contamination above acceptable levels exists on the property.

7.2.1 Review of Risk Assessments and Toxicity Factors Serving as the Basis for the Remedy

Operable Unit 1 – Source Areas Properties

Risk Assessment Review

The Endangerment Assessment (Ebasco, 1988) evaluated potential impacts to human health and the environment in the absence of remedial action under both current and potential future use scenarios. The site was divided into six areas that were treated individually. The six areas included the five Source Area properties and the Central Area, defined as the area surrounding Wells G and H, the Aberjona River, and the wetlands (i.e., the nonsource areas). Human exposures were considered at all six areas; ecological exposures were only evaluated for the Central Area.

For the human health Source Area evaluation, groundwater and soil exposures at the five Source Area properties were examined. Future residential groundwater use was evaluated for each area and included the ingestion of drinking water and inhalation of volatiles while showering. Because groundwater was used at the time as process water at the NEP facility, groundwater was also evaluated for the inhalation of volatiles released to indoor air during commercial groundwater use for the NEP property. Current soil exposures at the NEP and Olympia properties were evaluated for adolescent trespasser and commercial worker exposures via ingestion, dermal contact, and inhalation exposures. Current trespasser exposures only were evaluated for the Wildwood property. Due to the presence of paving at the UniFirst property, the current soil exposure pathway was considered incomplete. The NEP, Olympia, Wildwood, and UniFirst properties were also evaluated for future residential soil exposures via ingestion and dermal contact. In 1988, no soil Contaminants of Potential Concern (COPCs) were identified for the Grace property; therefore, no soil evaluation was conducted at this property.

The evaluation of future domestic use of groundwater at all five Source Areas resulted in estimated risks above a level of concern. Significant groundwater risk and hazard contributors included arsenic, chloroform, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethene, 1,1,1-trichloroethane, tetrachloroethene, trichloroethene, and vinyl chloride. Current risks and hazards were noted at the Wildwood property based on adolescent trespasser soil exposures. In addition, soil exposures based on future residential assumptions resulted in risks and hazards above a level of concern for the NEP and Wildwood properties. Significant risk contributors for the Wildwood property included chlordane, 4,4'-DDT, PCBs, PAHs, and lead. Phthalates and tetrachloroethene were the primary risk contributors in soils at the NEP property.

In this third Five-Year Review, the toxicity values that served as the basis for the clean-up levels, as contained in the ROD, have been re-evaluated to determine whether any changes in toxicity impact the protectiveness of the remedy. Any changes in current or potential future exposure pathways or exposure assumptions that may impact remedy protectiveness are also noted. In addition, environmental data, available since the last Five-Year Review, have been evaluated to determine whether exposure levels existing at the Site present a risk to current human receptors.

Changes in Toxicity

Table 3 presents the changes in toxicity values (oral reference doses and oral cancer slope factors) for compounds selected as COPCs in the 1988 Endangerment Assessment. Updated toxicity information was obtained from the *Integrated Risk Information System* (IRIS; EPA, 2009b) and from the Superfund Technical Support Center (STSC), a division of EPA. In general, minor changes (i.e., slight increases or decreases) in toxicity values have occurred for most COPCs. However, the safe level of exposure to manganese (i.e., manganese toxicity value) has been reduced by a factor of 10 since 1988 rendering the compound more toxic than had previously been believed. Manganese levels in groundwater were not above a level of concern in the 1988 Endangerment Assessment, despite the fact that manganese was present at levels that may have been aesthetically unpleasing (exceeded the secondary MCL of 50 ug/L). EPA has since issued a health advisory level for manganese of 300 ug/L, which EPA has used as the interim groundwater cleanup level on recent Superfund sites. Based upon a current evaluation of manganese using the current toxicity estimates, future exposures to manganese in groundwater may exceed safe levels at UniFirst, Grace, Wildwood and Olympia properties. Therefore, manganese in OU-1 groundwater may require further investigation at the UniFirst, Grace, Wildwood and Olympia properties to determine if concentrations exceed risk levels based upon the current toxicity estimates. There are no current arsenic data at the Grace, UniFirst or Wildwood properties. Data more recently collected using up-to-date groundwater sampling protocols do not indicate an exceedance of the manganese health advisory value at NEP; however, recent data from the Olympia property have some exceedances for manganese.

Table 3: Comparison of 1988 and 2009 Oral Reference Doses and Oral Cancer Slope Factors for Compounds of Potential Concern
Wells G&H Superfund Site

Contaminant of Potential Concern	Oral Reference Dose (RfD) (mg/kg-day)		Oral Slope Factor (SF) $(mg/kg\text{-}day)^{-1}$	
	1988	2009	1988	2009
1,1-Dichloroethane	0.12	0.2	0.091	0.0057
1,1-Dichloroethene	0.009	0.05	0.6	N/A
1,1,1-Trichloroethane	0.09	2	N/A	N/A
1,2-Dichlorobenzene	0.09	0.09	N/A	N/A
1,2-Dichloroethane	N/A	0.02	0.091	0.091
Acetone	0.1	0.9	N/A	N/A
Chloroform	0.01	0.01	0.081	0.031
Methylene Chloride	0.06	0.06	0.0075	0.0075
Tetrachloroethene	0.02	0.01	0.051	0.54
trans-1,2-Dichloroethene	0.01	0.02	N/A	N/A
Toluene	0.3	0.08	N/A	N/A
Trichloroethene	N/A	N/A	0.011	0.013

Table 3: Comparison of 1988 and 2009 Oral Reference Doses and Oral Cancer Slope Factors for Compounds of Potential Concern

Wells G&H Superfund Site

Contaminant of Potential Concern	Oral Reference Dose (RfD) (mg/kg-day)			Oral Slope Factor (SF) $(mg/kg\text{-}day)^{-1}$	
	1988	2009		1988	2009
Vinyl Chloride	N/A	0.003		2.3	0.72
Xylenes	2	0.2		N/A	N/A
bis(2-Ethylhexyl)phthalate	0.02	0.02		0.0084	0.014
PAHs[1]	0.41	0.02		11.5	7.3
Pentachlorophenol	0.03	0.03		N/A	0.12
Phenol	0.04	0.3		N/A	N/A
4,4'-DDT	0.0005	0.0005		0.34	0.34
Aldrin	0.00003	0.00003		17	17
Chlordane	0.0005	0.0005		1.3	0.35
PCBs[2]	N/A	0.00002		7.7	2
Antimony	0.0004	0.0004		N/A	N/A
Arsenic	N/A	0.0003		1.5	1.5
Barium	0.05	0.2		N/A	N/A
Cadmium (water)	0.0005	0.0005		N/A	N/A
Chromium VI	0.005	0.003		N/A	N/A
Copper	0.037	0.04		N/A	N/A
Iron[3]	1	N/A		N/A	N/A
Lead[4]	0.0006	N/A		N/A	N/A
Manganese (water)	0.22	0.024		N/A	N/A
Manganese (other media)	0.22	0.07		N/A	N/A
Mercury (inorganic)	0.0014	0.0003		N/A	N/A
Mercury (organic)	0.0014	0.0001		N/A	N/A
Nickel	0.02	0.02		N/A	N/A
Zinc	0.21	0.3		N/A	N/A

N/A = Not Applicable or Not Available

1. Naphthalene used for RfD; benzo(a)pyrene used for slope factor. The slope factor is then adjusted for relative potency of other carcinogenic PAHs. No adjustment for relative potency was made in 1988.
2. 1988 value for slope factor used Aroclor 1260
3. No toxicity value is currently available for iron. Region I does not concur with the provisional value for this compound.
4. Lead currently evaluated through the use of lead exposure models for children and adults.

A re-evaluation of the toxicity of 1,1,1-trichloroethane was completed by EPA in 2007. The revised noncarcinogenic toxicity value (i.e., oral RfD) is more than 20-fold higher than that used in the 1988 Endangerment Assessment indicating that, based on the most recent toxicity data, this compound is now considered to be less toxic than once believed. Therefore, the significant change in the toxicity of this compound does not affect the protectiveness of the remedy.

Clean-up standards for groundwater were established as MCLs, which is consistent with the current selection of groundwater clean-up standards in areas that may serve as a potential source of drinking water. All COCs in groundwater, based on the results of the 1988 Endangerment Assessment, were targeted for clean-up, with the exception of arsenic. At that time, groundwater

concentrations at the Source Area properties were not above the arsenic MCL of 50 ug/L. However, the MCL for arsenic has been reduced to 10 ug/L since 1988.

Based upon a current evaluation of arsenic using the current MCL, future exposures to arsenic in groundwater may exceed safe levels at UniFirst, Grace, Wildwood and Olympia properties. Therefore, arsenic in OU-1 groundwater may require further investigation at UniFirst, Grace, Wildwood and Olympia properties to determine if concentrations exceed risk levels based upon current toxicity estimates. There are no current arsenic data at the Grace, UniFirst or Wildwood properties. Data more recently collected using up-to-date groundwater sampling protocols do not indicate an exceedance of the arsenic MCL at NEP; however, recent data from the Olympia property have some exceedances for arsenic.

Soil contaminants requiring cleanup were based on the COCs identified as presenting a direct-contact hazard by the 1988 Endangerment Assessment (tetrachloroethene, lead, chlordane, 4,4'-DDT, PAHs, and PCBs). VOCs selected as groundwater COCs (tetrachloroethene, trichloroethene, chloroform, trans-1,2-dichloroethene and 1,1,1-trichloroethane) were also targeted for clean-up in soil based on their potential to serve as a source of contamination to groundwater. However, to assure that the clean-up levels for other volatile compounds in addition to tetrachloroethene in soil do not present a direct contact risk using current toxicity information, a comparison of the leaching-based soil clean-up levels to EPA Screening Levels (EPA, 2009b) for residential soil has been performed and is presented in Table 3A. Screening Levels are developed based on current toxicity information and correspond to a carcinogenic risk of 1E-06 and a noncarcinogenic hazard of 1. This comparison indicates that the soil clean-up levels are adequately protective for a residential exposure scenario. The soil clean-up level for lead was calculated by using the *Integrated Exposure Uptake Biokinetic Model* (EPA, 2002c). This model continues to be used to evaluate acceptable levels in soil. Clean-up levels for non-volatile contaminants (chlordane, 4,4'-DDT, PAHs, and PCBs) were based on a direct contact risk. Further evaluation of these compounds (lead and non-volatile contaminants) based on a comparison to EPA Screening Levels (Table 3A) also indicates that the soil clean-up levels remain adequately protective with respect to human health. Even though the cleanup levels for chlordane, 4,4'-DDT, benzo(a)pyrene and PCBs exceed screening levels set at a cancer risk of 1E-06, the cumulative risks for all carcinogenic compounds combined would be within EPA's acceptable risk range.

Table 3A: Comparison of ROD Soil Clean-up Levels to Risk-Based Screening Levels

Pollutant	ROD Soil Clean-up Level (ug/kg)	EPA Screening Level (ug/kg)	Target Cancer Risk Associated with Clean-up Level
Chloroform	62.5	300	2E-07
Tetrachloroethene	36.7	570	7E-08
Trichloroethene	12.7	2,800	5E-09
trans-1,2-Dichloroethene	83.2	110,000	8E-10
1,1,1-Trichloroethane	613	9,000,000	NA
Chlordane	6,140	1,600	4E-06
4,4'-DDT	23,500	1,700	1.4E-05
Benzo(a)pyrene	694	15	4.6E-05

Table 3A: Comparison of ROD Soil Clean-up Levels to Risk-Based Screening Levels			
Pollutant	**ROD Soil Clean-up Level (ug/kg)**	**EPA Screening Level (ug/kg)**	**Target Cancer Risk Associated with Clean-up Level**
PCBs	1,040	220	5E-06

NA – Not applicable since compound not considered carcinogenic

AWQC were used to set NPDES discharge limits. These criteria have changed and could result in an unacceptable discharge of pollutants to surface water at the Site.

Changes in Exposure Pathways/Assumptions

a. Non-Ingestion Groundwater Pathway

The 1988 Endangerment Assessment did not comprehensively evaluate non-ingestion uses of groundwater such as dermal contact exposures during industrial groundwater usage. Direct contact exposures associated with excavation into the water table by workers were also not evaluated. Because of persistent groundwater contamination at each Source Area property in combination with uncertainty regarding the location and magnitude of potential exposures, non-ingestion groundwater exposures should be prevented through the implementation of property-specific controls until the remedy is complete. If non-ingestion groundwater exposures are to occur before the remedy is complete (e.g., excavations that exposure shallow groundwater), personal protective measures should be used or a risk evaluation conducted to determine whether such exposures would be associated with risks and hazards above risk management guidelines, based on current groundwater contaminant concentrations present in the area of interest.

b. Grace Soil Contamination

Soil data collected in 2005 at the W.R. Grace property as part of re-development activities identified localized areas of elevated levels of TCE, PCE and other volatile and semi-volatile compounds in soil (e.g., PCBs and naphthalene) above ROD cleanup goals.

c. Vapor Intrusion

A third pathway of current potential concern for the Source Area properties is the subsurface vapor intrusion (i.e., indoor air) pathway. An initial evaluation of historical indoor air data at the UniFirst and Grace properties and 2003 groundwater VOC contaminant data at all the Source Area properties was conducted as part of the second Five-Year Review. The evaluation of the historical indoor air results indicated that risks to commercial workers at the Grace property were within or below EPA risk management guidelines, while risks to commercial workers at the UniFirst property may exceed EPA risk management guidelines. Because the historical indoor air data may not have been representative of current site conditions, an evaluation of indoor air impacts based on the 2003 groundwater data was also performed. The groundwater evaluation indicated that current potential risks at the UniFirst, Grace, NEP, and Wildwood properties were within or below EPA risk management guidelines, based on assumed commercial site use. Risk

associated with future residential use at the UniFirst, Grace, and NEP properties were also within or below EPA risk management guidelines. Estimated future risks at the Olympia property (i.e., FDDA), based on commercial and residential use assumptions, and the upland portions of the Wildwood property, based on assumed residential use, may exceed EPA risk management guidelines. Based on this evaluation, the second Five-Year Review concluded that the indoor air pathway at the Source Area properties was unlikely to present a current risk of harm to humans and the remedy was determined to be protective in 2004 with respect to the indoor air pathway. However, the second Five-Year Review noted that should commercial activities be proposed for the Olympia property (FDDA), land use change to residential for the Olympia and Wildwood properties, or shallow groundwater VOC concentrations change significantly from those present in 2003, indoor air exposures to VOCs from groundwater should be reevaluated.

The Olympia and Wildwood properties remain undeveloped at this time. No other land use changes at the site have occurred since the second Five-Year Review other than the demolition of the Grace buildings in preparation for re-development. Because the Grace property may be redeveloped, the potential for a vapor intrusion issue has been re-evaluated in the following section, based on the most recent soil and shallow groundwater data available for the Grace property. In addition, groundwater data collected over the last five years from the other four Source Area properties and soil and soil gas data collected at the UniFirst property are discussed in the following section to determine whether conclusions concerning the indoor air pathway should change from those presented in the second Five-Year Review Report.

Evaluation of Recent Sampling Data

To determine whether the conclusions concerning current and future indoor air impacts as presented in the second Five-Year Review Report require modification, current Source Area property shallow groundwater (i.e., less than 30 feet in depth) contaminant concentrations have been compared to those used in the 2004 evaluation. Though contaminant concentrations in deeper groundwater may also impact indoor air quality (possibly up to 100 feet in depth), shallow groundwater data are likely to be the most representative of potential impacts to indoor air quality. If contaminant concentrations have remained stable or decreased over the last five years, then the 2004 conclusions concerning the vapor intrusion pathway remain valid. However, if groundwater contaminant concentrations have increased substantially over the last five years, conclusions concerning the vapor intrusion pathway may need modification. Conclusions drawn from this type of screening are limited by the number of monitoring wells sampled as well as their placement relative to current buildings or locations where future buildings may be constructed. For this reason, this screening only provides a preliminary indication of current and potential future indoor air impacts. Follow-up sampling and evaluation, including the installation of additional monitoring wells, may be necessary should a currently complete vapor intrusion pathway be indicated or should property re-development occur that would involve the construction of an on-site building.

Table 4 provides a comparison of maximum detected shallow groundwater VOC concentrations in 2003 and 2008.

Table 4: Comparison of Maximum Detected Shallow Groundwater VOC Concentrations 2003 and Current* Results – Source Area Properties (OU-1) Wells G&H Superfund Site		
Detected Analyte	**2003 Maximum Detection (ug/L)**	**Current* Maximum Detection (ug/L)**
UniFirst (2008)		
1,1-Dichloroethane	2	1
2-Butanone	94	ND
Acetone	55	ND
Cis-1,2-Dichloroethene	450	320
Methylene chloride	5	ND
Tetrachloroethene	150	***190***
Toluene	33	***43***
Trichloroethene	56	***87***
W.R. Grace (2008)		
1,1-Dichloroethene	2.2	ND
1,2-Dichloroethene	740	420
Tetrachloroethene	391	20
Trichloroethene	391	110
Vinyl chloride	16.8	ND
NEP (2008)		
Cis-1,2-Dichloroethene	6	ND
Tetrachloroethene	17	10
Wildwood (2007)		
1,1,1-Trichloroethane	130	***220***
1,1-Dichloroethane	3	***4.7***
Chloroform	6	***6.5***
Tetrachloroethene	200	***5,400***
Trichloroethene	3,600	***6,600***
Vinyl chloride	15	1.4
Olympia (2009)		
Dichlorodifluoromethane	6	ND
1,2-Dichlorobenzene	6	ND
4-Methyl-2-pentanone	1	ND
Acetone	4	ND
Carbon disulfide	2	ND
Chloroform	64	***300***
Cis-1,2-Dichloroethene	1,500	550

Table 4: Comparison of Maximum Detected Shallow Groundwater VOC Concentrations 2003 and Current* Results – Source Area Properties (OU-1) Wells G&H Superfund Site		
Detected Analyte	**2003 Maximum Detection (ug/L)**	**Current* Maximum Detection (ug/L)**
Ethylbenzene	25	ND
Freon 113	410	***34,000***
Methyl tert-butyl ether	1	ND
Methylene chloride	2	ND
Tetrachloroethene	410	***530***
Toluene	1	ND
Trans-1,2-Dichloroethene	9	ND
1,1,1-Trichloroethane	ND	***66***
Trichloroethene	12,000	***40,000***
Vinyl chloride	190	30
Xylenes	160	***2,560***

Notes:
* - Most recent date for each property specified in parentheses
ND = Not detected above the analytical reporting limit
Current concentrations in ***Bold and Italics*** exceed 2003 concentrations.

1. NEP

   Based on the groundwater comparison, the conclusions of the second Five-Year Review with respect to the vapor intrusion pathway for the NEP property continue to be valid because shallow groundwater concentrations have decreased over the last five years.

2. Wildwood

   The groundwater comparison indicates that current groundwater concentrations exceed 2003 concentrations at the Wildwood property for 1,1,1-TCA, 1,1-Dichloroethane (1,1-DCA), chloroform, PCE, and TCE. Because the Wildwood property is not developed, the increase in groundwater concentrations does not affect the protectiveness of the remedy as long as this pathway is evaluated and considered prior to its development for either commercial or residential use.

3. Olympia

   The groundwater comparison indicates that current groundwater concentrations exceed 2003 concentrations at the Olympia property for chloroform, Freon 113, PCE, TCE, 1,1,1-TCA and xylenes. Because the FDDA portion of the Olympia property is not developed, the increase in groundwater concentrations does not affect the protectiveness of the remedy as long as this pathway is evaluated and considered prior to its development for either commercial or residential use.

4. UniFirst

For the UniFirst property, concentrations of the two potentially significant risk contributors (PCE and TCE) increased between 25% and 50% in the last five years. Though the 2003 shallow groundwater concentrations did not indicate a current risk or hazard to commercial workers at the property based on fate and transport modeling, the increased concentrations suggest an increased threat to indoor air within the occupied commercial building. To further evaluate the vapor intrusion pathway at the UniFirst property, in 2008, EPA conducted a review of 1994 soil gas and soil data collected in close proximity to and beneath the existing commercial building to determine whether the residual VOC contamination indicates a threat to indoor air for current commercial use of the building. These data were also used to evaluate indoor air impacts to a future residential building. The soil gas evaluation resulted in the conclusion that the residual contamination has the potential to pose a current and future risk above EPA's risk management criteria for the subsurface vapor intrusion pathway. This conclusion was further substantiated by the evaluation of soil data collected from beneath the current building, which also indicated potential risk above risk management criteria for the current and future indoor air pathways. Though the evaluation is uncertain due to the age of the data and the use of fate and transport modeling to estimate exposure point concentrations in indoor air, impacts to this currently occupied building require further investigation and evaluation due to the multiple lines of evidence strongly suggesting that residual soil and groundwater VOC concentrations may, alone or in combination, pose a threat to workers at the building.

5. Grace

Based on the groundwater comparison, the conclusions of the second Five-Year Review with respect to the vapor intrusion pathway at the Grace property may still be valid because shallow groundwater concentrations have decreased over the last five years. However, soil data collected in 2005 at the Grace property as part of re-development activities showed localized areas of elevated levels of TCE, PCE and other volatile and semi-volatile compounds in soil (e.g., PCBs and naphthalene). Though there is no building currently on the property (other than the treatment building), the presence of elevated levels of volatile and semi-volatile compounds in soil at the Grace property should be further evaluated either before or as part of re-development activities to determine their extent and potential impact on indoor air quality should the construction of a building occur at the property.

6. Downgradient UniFirst, Grace and NEP

Additional concerns have been identified with the possible vapor intrusion pathway downgradient from/near the UniFirst, Grace and NEP properties based upon indoor air concerns at UniFirst identified above, potential insufficient groundwater capture at UniFirst and Grace, persistent groundwater contamination at UniFirst, Grace and NEP, and uncertain groundwater conditions downgradient from/near UniFirst, Grace and NEP. Further investigation of this potential pathway should be conducted.

7.2.2 ARARs Review

This Five-Year Review includes a review of Applicable or Relevant and Appropriate Requirements (ARARs) to check the impact on the remedy due to changes in standards that were identified as ARARs in the ROD, newly promulgated standards for COPCs, and TBCs (to be considered) that may affect the protectiveness of the remedy. The tables in Attachment 7 provide the ARARs review. The review is summarized below.

The ROD set forth the following ARARs for the selected remedy:

Location-Specific:

- Resource Conservation and Recovery Act (RCRA)
- Clean Water Act (CWA)
- Wetlands Executive Order (EO 11990)
  - Floodplains Executive Order (EO11888)
  - Protection of Archaeological Resources (32 CFR 229)
  - Massachusetts Wetland Protection Requirements (310 CMR 10.00)
  - Massachusetts Waterways Licenses (310 CMR 9.00)
  - Massachusetts Certification for Dredging and Filling (314 CMR 9.00)
- Massachusetts Surface Water Discharge Permit Program Requirements (314 CMR 3.00)
- Massachusetts Surface Water Quality Standards (314 CMR 4.00)
- Massachusetts Groundwater Quality Standards (314 CMR 6.00) and Groundwater Discharge Permit Program (314 CMR 5.00)
- Air Emission Limitations for Unspecified Sources of Volatile Emissions (310 CMR 7.18 (17))
- Inland Wetland Orders (302 CMR 6.00)
- Operation and Maintenance and Pretreatment Standards for Waste Water Treatment Works and Indirect Discharges (314 CMR 12.0)
- EPA Groundwater Protection Strategy
- EPA Directive 9355.0-28; Air Stripper Control Guidance

Chemical-Specific:

- Safe Drinking Water Act (SDWA)
- Resource Conservation and Recovery Act (RCRA)
- CWA Federal Ambient Water Quality Criteria (AWQC)
- EPA Reference Doses (RfDs)
- EPA Carcinogen Assessment Group Potency Factors
- Massachusetts Drinking Water Regulations (310 CMR 22.00)
  - Massachusetts Groundwater Quality Standards

- Massachusetts Drinking Water Health Advisories

Action-Specific:

- Resource Conservation and Recovery Act (RCRA)
- Toxic Substances Control Act (TSCA)
- Clean Water Act (CWA)
- Clean Air Act (CAA)
- Occupational Safety and Health Administration (OSHA)
- Department of Transportation
- Hazardous Waste Management Requirements (310 CMR 30.00)
- Hazardous Waste Incinerator Air Emission Requirements (310 CMR 7.08(4))
- Ambient Air Quality Standards for the Commonwealth of Massachusetts (310 CMR 6.00)
- Air Pollution Controls (310 CMR 7.00)
- Employee and Community Right to Know (310 CMR 7.00)

Tables A7-1, A7-2, and A7-3 of Attachment 7 provide an evaluation of ARARs using the regulations and requirement synopses listed in the ROD as a basis. The evaluation includes a determination of whether the regulation is currently an ARAR or TBC and whether the requirements have been met. Most of the listed ARARs remain applicable or relevant and appropriate to the Site and are being complied with. As indicated in the attached tables, some ARARs no longer apply, such as the requirements that applied to the on-site incineration component of the remedy as identified in the ROD. The on-site incineration component was eliminated by the April 1991 ESD.

Since the second Five-Year Review, there have been no significant changes to the ARARs that impact the remedy for OU-1. Changes have been made to ARARs since the development of the ROD. Theses changes are provided in the table in Attachment 7. No ARARs evaluations were conducted for OU-2 since this OU does not have a signed ROD. Future Five-Year Reviews for the Industri-Plex Site will perform the ARARs review for the Industri-Plex OU-2 remedy, including Wells G&H OU-3.

7.3 *Question C*: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no other information that calls into question the current protectiveness of the Source Area (OU-1) remedy.

7.4 Technical Assessment Summary

According to the data reviewed, the site inspections and the interviews, a protectiveness determination of the Source Area (OU-1) remedy cannot be made at this time until further information is obtained. Additional data will be collected to evaluate potential vapor intrusion

impacts at the existing building on the UniFirst property. Additional data will also be collected to evaluate the vapor intrusion pathway near the UniFirst, Grace and NEP properties. It is expected that these actions will take approximately 6-12 months to complete at which time a protectiveness determination will be made.

8.0 · ISSUES

Table 5: Issues		
Issues	**Affects Current Protectiveness (Y/N)**	**Affects Future Protectiveness (Y/N)**
Potential current indoor risks above EPA's risk management guidelines based upon an evaluation of the soil gas to indoor air and soil to indoor air pathways for the existing commercial building at UniFirst property	Y	Y
Uncertain water quality conditions downgradient from/ near the UniFirst, Grace and NEP Source Area properties that may contribute to a potential vapor intrusion pathway.	Y	Y
No soil remedy has been implemented at UniFirst (SVE).	N	Y
No property-specific institutional controls implemented at the Source Area properties to prevent public contact with contaminated groundwater and soil above cleanup levels,.	N	Y
Persistent groundwater contaminant concentrations at all Source Area properties.	N	Y
Extraction systems performance (possible insufficient capture of groundwater contamination) at UniFirst, W.R. Grace and Wildwood properties.	N	Y
No groundwater pump and treatment system implemented at NEP following AS/SVE shutdown.	N	Y
No recent data regarding groundwater contaminant concentrations in deep bedrock at NEP.	N	Y
Area south of Wildwood treatment system may have groundwater contamination in excess of ROD cleanup goals not receiving treatment.	N	Y
No groundwater pump and treatment remedy implemented at Olympia.	N	Y
Soil contaminant concentrations at Grace property exceed ROD Action Levels.	N	Y
The 1988 Endangerment Assessment did not comprehensively evaluate non-ingestion uses of groundwater such as dermal contact during industrial groundwater usage or direct contact during trench excavation under certain current (commercial worker) and future (commercial worker, residential) scenarios at Source Area properties.	N	Y
Arsenic MCL recently changed from 50 ug/L to 10 ug/L. Arsenic was not previously targeted for cleanup based on prior MCL. Historical arsenic concentrations were either above 10 ug/L, or detection limits exceeded 10 ug/L. In addition, manganese was not identified as a COC in OU-1 groundwater under the 1988 Endangerment Assessment. Manganese toxicity values have been reduced by a factor of 10 since the assessment. Future exposures to manganese in groundwater may exceed EPA's Lifetime Health Advisory.	N	Y

Table 5: Issues		
Issues	**Affects Current Protectiveness (Y/N)**	**Affects Future Protectiveness (Y/N)**
An evaluation of the groundwater to indoor air pathway indicates potential future risks at the Olympia property (commercial, residential) and Wildwood property (residential) might exceed EPA risk management guidelines should re-development occur. Newly discovered soil contamination on Grace property may also present vapor intrusion issue should redevelopment occur. Re-development at any of the Source Area properties may present a vapor intrusion risk.	N	Y
AWQCs associated with aquatic life have decreased since the ROD. AWQCs were used to establish effluent limits for remedial system discharges at the UniFirst and Grace properties.	N	Y

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Table 6: Recommendations and Follow-Up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Potential current indoor risks above EPA's risk management guidelines based upon an evaluation of soil gas to indoor air and soil to indoor air pathways for the existing commercial building at UniFirst property.	Additional data collection at UniFirst property to assess vapor intrusion, and evaluate and implement technical solutions as appropriate.	PRP and EPA	EPA	2010	Y	Y
Uncertain water quality conditions downgradient of the UniFirst, Grace and NEP properties which may contribute to a potential vapor intrusion pathway.	Install additional monitoring wells and collect additional groundwater data downgradient from/ near UniFirst Grace and NEP properties to assess potential vapor intrusion pathway. Collect any further data, and evaluate and implement technical solutions as appropriate.	PRP and EPA	EPA	2010	Y	Y
No soil remedy has been implemented at UniFirst (SVE).	Review soil contamination issues at UniFirst, collect additional data, and evaluate and implement technical solutions.	PRP and EPA	EPA	2011	N	Y
No property-specific institutional controls implemented at the Source Area properties to prevent public contact with contaminated groundwater and soil above cleanup levels	Property-specific institutional controls should be established at each source area property to prevent potential exposures to the public, until the source control remedy has been completed.	PRP, EPA, State and City	EPA	2011	N	Y

Table 6: Recommendations and Follow-Up Actions						
Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Persistent groundwater contaminant concentrations at all Source Area Properties.	Additional data collection and/or analysis to diagnose the limited VOC reductions at all Source Area properties, and improve system performance and pace of Site cleanup.	PRP	EPA	2014	N	Y
Extraction systems performance (possible insufficient capture of groundwater contamination) at UniFirst, W.R. Grace and Wildwood properties.	Additional data collection and/or analysis to determine whether or not sufficient capture has been achieved at UniFirst, Grace and Wildwood properties, and, where appropriate take corrective actions to ensure sufficient capture in the future.	PRP	EPA	2011	N	Y
No groundwater pump and treatment system implemented at NEP following AS/SVE shutdown.	Assess groundwater conditions on NEP property since AS/SVE shutdown, evaluate the need for further groundwater treatment, and where appropriate consider other treatment technologies.	PRP	EPA	2012	N	Y
No recent data regarding groundwater contaminant concentrations in deep bedrock at NEP	Additional data collection to evaluate deep bedrock groundwater conditions on the NEP property, and where appropriate evaluate groundwater remedial technologies.	PRP	EPA	2010	N	Y

Table 6: Recommendations and Follow-Up Actions						
Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Area south of Wildwood treatment system may have groundwater contamination in excess of ROD cleanup goals not receiving treatment.	Assess groundwater conditions south of Wildwood treatment system, evaluate the need for further groundwater and soil treatment, and consider other treatment technologies as appropriate.	PRP and EPA	EPA	2011	N	Y
No groundwater pump and treatment remedy implemented at Olympia.	Evaluate progress of Olympia's soil clean up (ISCO) to achieve ROD groundwater and soil cleanup standards. Assess need for groundwater cleanup at the conclusion of the removal action.	PRP	EPA	2014	N	Y
Soil contaminant concentrations at Grace property exceed ROD Action Levels.	Assess extent of soil contamination exceeding ROD Action Levels. Evaluate and implement response actions as appropriate.	PRP	EPA	2010	N	Y
The 1988 Endangerment Assessment did not comprehensively evaluate non-ingestion uses of groundwater such as dermal contact during industrial groundwater usage or direct contact during trench excavation under certain current (commercial worker) and future (commercial worker, residential) scenarios at Source Area properties.	Because of persistent groundwater contamination at each Source Area property, non-ingestion groundwater exposures should be prevented through the implementation of property-specific controls until the remedy is complete.	PRP (data) EPA (risk)	EPA	2011	N	Y

Table 6: Recommendations and Follow-Up Actions						
Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Arsenic MCL recently changed from 50 ug/L to 10 ug/L. Arsenic was not previously targeted for cleanup based on prior MCL. Historical arsenic concentrations were either above 10 ug/L, or detection limits exceeded 10 ug/L. In addition, manganese was not identified as a COC in OU-1 groundwater under the 1988 Endangerment Assessment. Manganese toxicity values have been reduced by a factor of 10 since the assessment. Future exposures to manganese in groundwater may exceed EPA's Lifetime Health Advisory.	Assess current groundwater conditions relative to arsenic and manganese at UniFirst, Grace, Wildwood and Olympia properties, and where appropriate revise cleanup goals.	PRP (data) EPA (revise limits)	EPA	2011	N	Y
An evaluation of the groundwater to indoor air pathway indicates that potential future risks at the Olympia property (commercial, residential) and Wildwood property (residential) might exceed EPA risk management guidelines should re-development occur. Newly discovered soil contamination on Grace property may also present vapor intrusion issue should	Evaluate risk from exposure to indoor air at the Source Area properties based on up-to-date data if any of the properties are developed/ redeveloped.	PRP (data) EPA (risk)	EPA	2014	N	Y

Table 6: Recommendations and Follow-Up Actions						
Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
redevelopment occur. Re-development at any of the Source Area properties may present a vapor intrusion risk.						
AWQCs associated with aquatic life have decreased since the ROD. AWQCs were used to establish effluent limits for remedial system discharges at the UniFirst and Grace properties.	Assess NPDES equivalent discharge standards based upon current AWQCs, and revise discharge limits at UniFirst and Grace properties as appropriate.	PRP/EPA	EPA	2011	N	Y

10.0 PROTECTIVENESS STATEMENT(S)

A protectiveness determination of the Source Area (OU-1) remedy at the Wells G&H Superfund Site cannot be made at this time until further information is obtained. Additional data will be collected to evaluate potential vapor intrusion impacts at the existing building on the UniFirst Source Area property. Additional data will also be collected to evaluate the potential vapor intrusion pathway near the UniFirst, Grace and NEP Source Area properties. Once the data are collected, it will be assessed and a determination will be made whether or not additional measures are necessary to ensure protection of human health. It is expected that these actions will take approximately 6-12 months to complete at which time a protectiveness determination will be made.

In addition, for the Source Area (OU-1) remedy to be protective in the long term, the following measures should be taken:

- Property-specific institutional controls should be established at each Source Area property to prevent potential exposures to the public until the source control remedy has been completed;
- Additional data collection and/or analysis to diagnose the limited VOC reductions and improve system performance and pace of Site cleanup; additional data collection and/or analysis to determine whether or not sufficient capture has been achieved and, where appropriate, take corrective actions to ensure sufficient capture is occurring in the future; assessment of groundwater conditions on NEP property since AS/SVE shutdown, evaluation of the need for further groundwater treatment, and where appropriate consideration of other treatment technologies; additional data collection to evaluate deep bedrock groundwater conditions on the NEP property, and where appropriate evaluation of groundwater remedial technologies;
- Assessment of groundwater conditions south of the Wildwood treatment system, evaluation of the need for further groundwater and soil treatment, and consideration of other treatment technologies as appropriate; evaluation of progress of Olympia's soil removal action and assessment of the need for groundwater cleanup at the conclusion of the removal action; assessment of the extent of soil contamination on Grace property and evaluation and implementation of response actions as appropriate; prevention of non-ingestion groundwater exposures at each Source Area property through the implementation of property-specific controls until the remedy is complete; assessment of groundwater conditions relative to arsenic and manganese at UniFirst, Grace, Wildwood and Olympia properties, and where appropriate revision of cleanup goals; evaluation of risk from exposure to indoor air based on up-to-date data if any of the Source Area properties are developed/redeveloped; assessment of NPDES equivalent discharge standards based upon current AWQCs and revision of discharge limits, as appropriate; and review of soil contamination issues at UniFirst, collection of additional data, evaluation and implementation of technical solutions.

Currently, no remedy decision has been selected for OU-2 (Central Area Aquifer), which is under investigation. Thus, OU-2 is not evaluated as part of this Five-Year Review. OU-3

(Aberjona River Study) was incorporated into the upstream Industri-Plex Superfund Site OU-2. Thus, further evaluation of OU-3, including Five-Year Reviews, will be conducted as part of the Industri-Plex Site.

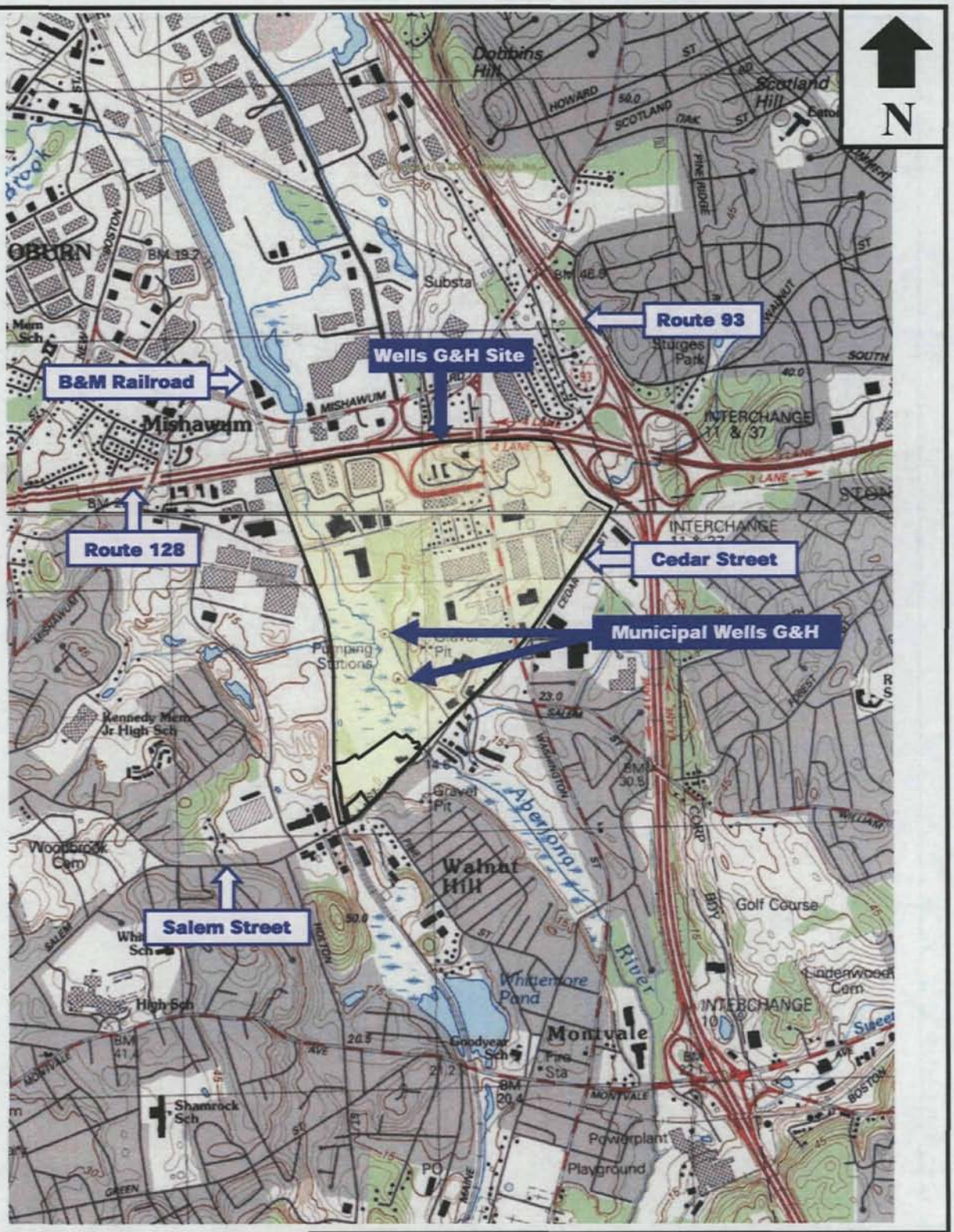
A protectiveness statement for the Wells G&H Site as a whole can not be made at this time until information identified above is obtained and evaluated. In addition, additional measures (described above) are necessary for the OU-1 remedy to be considered protective in the long term.

11.0 NEXT REVIEW

The next Five-Year Review for the Wells G&H Superfund Site is September 2014, five years from the date of this review. The next Five-Year Review should include a complete review of issues identified herein for OU-1. The next review should also include a complete review of data generated from groundwater, soil, and/or soil gas monitoring to confirm that the remedial actions are protective of human health and the environment.

ATTACHMENT 1

SITE MAPS



BASE MAP IS A PORTION OF THE FOLLOWING 7.5' USGS TOPOGRAPHIC QUADRANGLE: BOSTON NORTH, 1985

0 1000 2000 3000

scale in feet

FIGURE 1
LOCATION MAP
WELLS G&H
SUPERFUND SITE
WOBURN, MASSACHUSETTS

AECOM

TRC

Wannalancit Mills
650 Suffolk Street
Lowell, MA 01852
978-970-5600

QUADRANGLE LOCATION

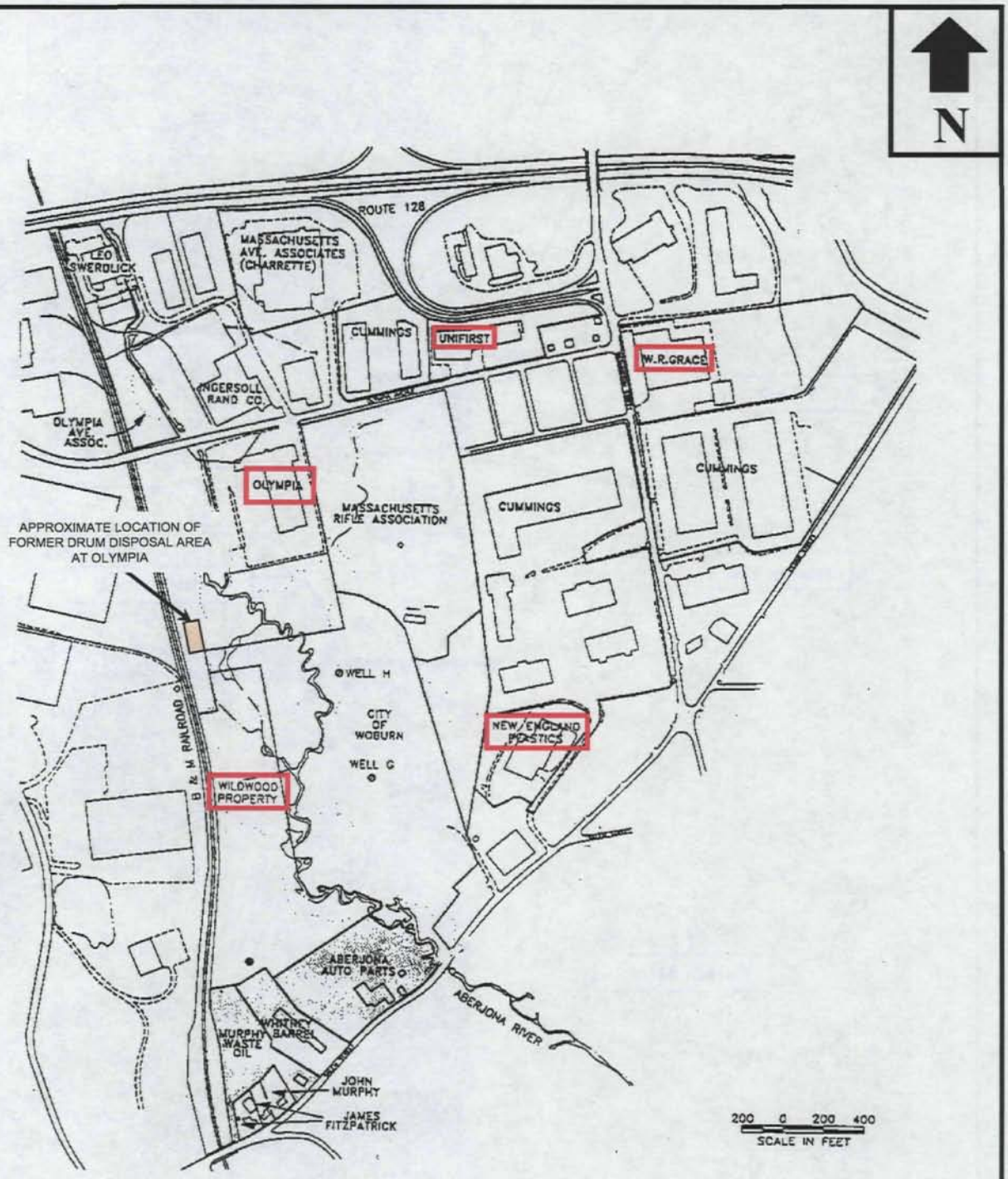
MASS

TRC PROJ. NO.: 104161

EPA CONTRACT NO.: EP-S1-06-01

SUBCONTRACT NO.: 3493

T:\E_CAD\02136\WELLS G&H\JUNE_2009\LOCATION_060409



LEGEND

Wells G&H Source Area Properties

FIGURE 2
SOURCE AREA PROPERTY LOCATIONS
WELLS G&H
SUPERFUND SITE
WOBURN, MASSACHUSETTS

AECOM

TRC

Wannalancit Mills
650 Suffolk Street
Lowell, MA 01852
978-970-5600

QUADRANGLE LOCATION

MASS

TRC PROJ. NO.: 104161

EPA CONTRACT NO.: EP-S1-06-01

SUBCONTRACT NO.: 3493

T:\E_CAD\02136\WELLS G&H\JUNE 2009\SITEMAP 060409

ATTACHMENT 2

GROUNDWATER DATA/ROD CLEANUP CRITERIA EXCEEDANCE TABLES

Attachment 2.1

UniFirst Groundwater Data In Excess of ROD Cleanup Levels

2004 to 2008

Unifirst - Monitoring Wells Exceeding ROD Cleanup Goals for Last Five Years (ug/L)						
Well	Contaminant	Min	Max	Most Recent	Average(1)	Rod Cleanup Goal
UC10-6	Tetrachloroethene	10	22	10	14.8	5
UC10-6	Trichloroethene	3	14	3	7.2	5
UC10-6	1,2-Dichloroethene	56	100	61	73.6	70
UC11-2	Tetrachloroethene	56	91	68	76.6	5
UC11-2	Trichloroethene	44	62	47	48.6	5
UC11-2	1,2-Dichloroethene	160	240	160	215.6	70
UC6	Tetrachloroethene	20	33	24	25.2	5
UC6	Trichloroethene	2	8	5	5.6	5
UC6	1,2-Dichloroethene	0.3	9	0.8	3.2	70
UC6S	Tetrachloroethene	2	6	4	4.0	5
UC6S	1,2-Dichloroethene	<1.0	2	<1.0	0.8	70
UC7-1	Tetrachloroethene	1,800	2,500	2,300	2,100	5
UC7-1	Trichloroethene	62	110	110	84.2	5
UC7-2	Tetrachloroethene	2,400	2,800	2,700	2,620	5
UC7-2	Trichloroethene	120	420	290	294	5
UC7-3	Tetrachloroethene	1,200	1,800	1,200	1,560	5
UC7-3	Trichloroethene	61	200	61	113.2	5
UC7-3	1,2-Dichloroethene	11	71	25	46.2	70
UC7-4	Tetrachloroethene	490	1,500	490	1,058	5
UC7-4	Trichloroethene	25	61	28	40.6	5
UC7-5	Tetrachloroethene	490	670	490	580	5
UC7-5	Trichloroethene	14	24	24	19	5
UC7-5	1,2-Dichloroethene	30	77	30	53.5	70
UG1-4	1,2-Dichloroethene	47	164	160	129.4	70

Notes:

< - Non-detect at specified laboratory reporting limit.

(1) - Average includes non-detects at 1/2 the laboratory reporting limit.

Unifirst - Monitoring Wells Exceeding ROD Cleanup Goals for Last Five Years (ug/L)						
Well	Contaminant	Min	Max	Most Recent	Average[1]	Rod Cleanup Goal
G01DB	Tetrachloroethene	8	15	8	11	5
G36DB2	Trichloroethene	7.1	23	15	15.8	5
G36DBR	Tetrachloroethene	0.6	14	9.6	8.6	5
G36DBR	Trichloroethene	4.7	31	31	18.5	5
S71D	Tetrachloroethene	45	180	67	86.6	5
S71D	1,2-Dichloroethene	<1.0	1	<1.0	0.6	70
S71S	Tetrachloroethene	26	78	29	52.2	5
S71S	1,2-Dichloroethene	<1.0	0.9	<1.0	0.6	70
S81D	Tetrachloroethene	88	140	88	108	5
S81D	1,2-Dichloroethene	<1.0	0.7	0.5	0.6	70
S81M	Tetrachloroethene	3	97	88	59.5	5
S81M	1,2-Dichloroethene	0.7	1	1	0.9	70
S81S	Tetrachloroethene	6	11	8	8.6	5
UC10-1	Tetrachloroethene	140	330	140	238	5
UC10-1	Trichloroethene	78	120	87	97.4	5
UC10-1	1,2-Dichloroethene	320	540	320	414.4	70
UC10-2	Tetrachloroethene	57	190	190	109.6	5
UC10-2	Trichloroethene	25	57	57	40.6	5
UC10-2	1,2-Dichloroethene	86	200	86	135.6	70
UC10-3	Tetrachloroethene	30	94	94	58.8	5
UC10-3	Trichloroethene	15	28	28	23.2	5
UC10-3	1,2-Dichloroethene	150	372	150	228.4	70
UC10-4	Tetrachloroethene	52	86	82	72.4	5
UC10-4	Trichloroethene	18	28	23	24	5
UC10-4	1,2-Dichloroethene	81	110	81	98.6	70
UC10-5	Tetrachloroethene	17	58	24	30	5
UC10-5	Trichloroethene	8	19	13	13.6	5
UC10-5	1,2-Dichloroethene	170	320	170	238	70

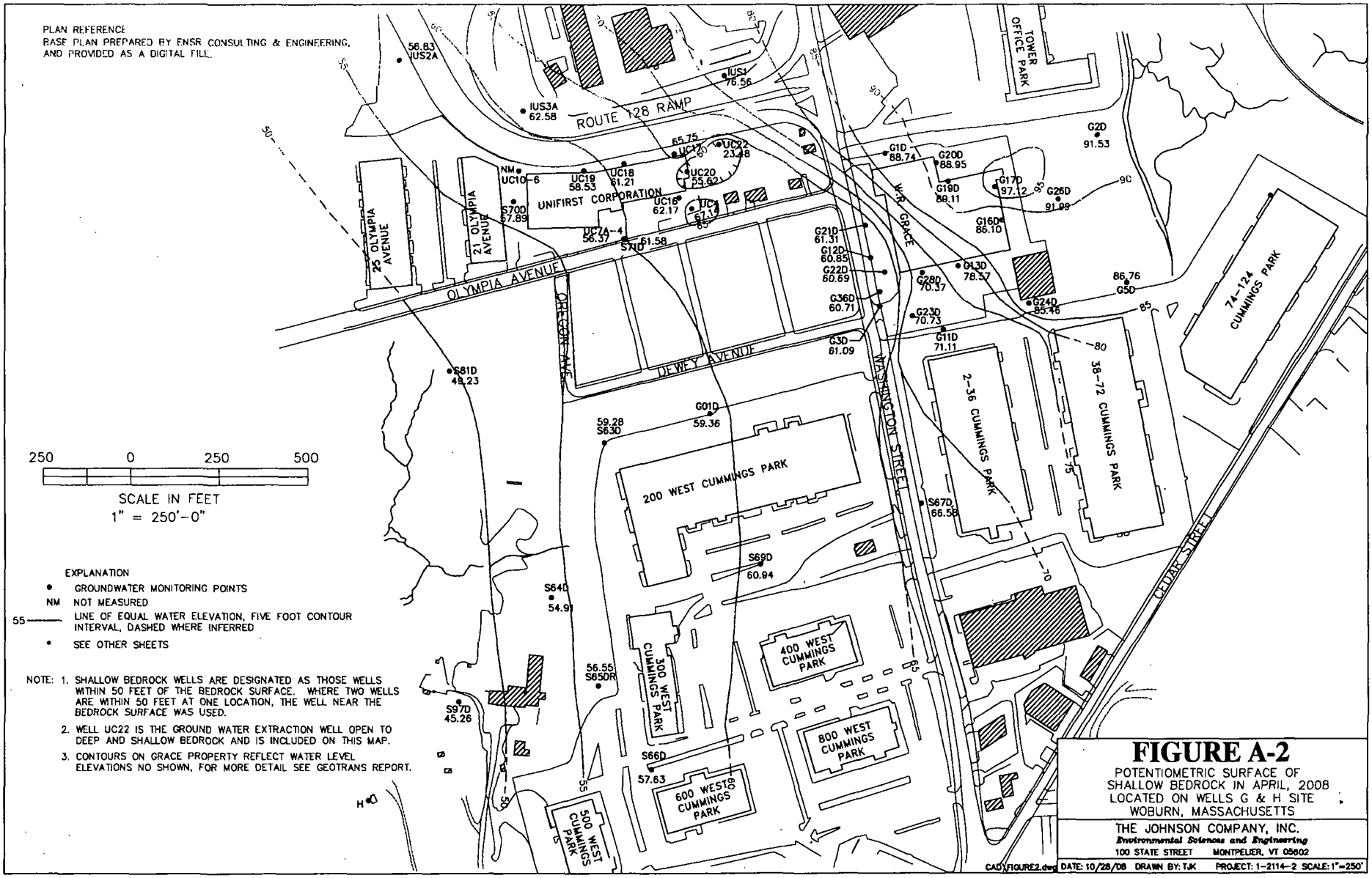


FIGURE A-2

POTENTIOMETRIC SURFACE OF SHALLOW BEDROCK IN APRIL, 2008 LOCATED ON WELLS G & H SITE WOBURN, MASSACHUSETTS

THE JOHNSON COMPANY, INC.
Environmental Sciences and Engineering
100 STATE STREET MONTPELIER, VT 05602

Attachment 2.2

Grace Groundwater Data in Excess of ROD Cleanup Levels

2004 to 2008

Grace - Monitoring Wells Exceeding ROD Cleanup Goals for Last Five Years (ug/L)						
Well	Contaminant	Min	Max	Most Recent	Average[1]	Rod Cleanup Goal
G11D	Trichloroethene	0.9	5.4	3	3	5
G13D	Trichloroethene	92	92	92	92	5
G15D	Vinyl Chloride	7	8.9	7	8	2
G16D	Trichloroethene	35	35	35	35	5
G16D	Vinyl Chloride	5.2	5.2	5.2	5.2	2
G19D	1,2-Dichloroethene	370	537.8	537.8	444.6	70
G19D	Tetrachloroethene	<5	5.7	<5	3	5
G19D	Trichloroethene	250	530	530	423.3	5
G19D	Vinyl Chloride	<10	20	20	11.2	2
G19M	1,2-Dichloroethene	190	240	200	213.4	70
G19M	Trichloroethene	220	350	240	268.6	5
G19M	Vinyl Chloride	8.2	14	12	11.2	2
G1DB	Trichloroethene	14	19	14	15.7	5
G1DB3	Vinyl Chloride	3.8	4	4	3.9	2
G20D	Trichloroethene	1.2	17	4.2	5.7	5
G20M	1,2-Dichloroethene	140	242.4	160	170.5	70
G20M	Trichloroethene	27	54	34	35	5
G20M	Vinyl Chloride	<1	<5	<2	1.8	2
G20S	1,2-Dichloroethene	56	240	56	151.5	70
G20S	Trichloroethene	9.5	34	9.5	22.6	5
G20S	Vinyl Chloride	<1	<5	<1	1.5	2
G22D	Trichloroethene	1.7	21	3	6.9	5
G23D	Trichloroethene	8.6	21	9.9	13.9	5
G24D	Trichloroethene	15	46	31	27.6	5
G24S	Trichloroethene	30	42	30	34.3	5
G28D	Trichloroethene	8.8	50	8.8	28.2	5
G28S	Trichloroethene	5.9	21	5.9	12.5	5

Grace - Monitoring Wells Exceeding ROD Cleanup Goals for Last Five Years (ug/L)						
Well	Contaminant	Min	Max	Most Recent	Average[1]	Rod Cleanup Goal
G34D	Trichloroethene	2.6	5.9	2.6	3.9	5
G35DB	1,2-Dichloroethene	87	87	87	87	70
G35DB	Trichloroethene	100	100	100	100	5
G36DB	Tetrachloroethene	0.6	9.6	9.6	5.5	5
G36DB	Trichloroethene	4.7	31	31	16.9	5
G36DB2	Trichloroethene	7.1	23	15	15.7	5
G36DBR	Tetrachloroethene	12	14	12	13	5
G36DBR	Trichloroethene	12	24	24	16.3	5
G3D	Tetrachloroethene	12	12	12	12	5
G3DB	Tetrachloroethene	36	36	36	36	5
G3DB	Trichloroethene	28	28	28	28	5
G4D	Trichloroethene	8.5	8.5	8.5	8.5	5
RW10	Tetrachloroethene	<0.5	201	<0.5	41.2	5
RW11	Tetrachloroethene	<0.5	11	3.3	3.5	5
RW11	Trichloroethene	2.4	17	2.4	11.4	5
RW12	Trichloroethene	1.1	21	6.6	7.7	5
RW13	Tetrachloroethene	19	60	20	33.2	5
RW13	Trichloroethene	2.4	5.3	2.4	3.6	5
RW14	Tetrachloroethene	3.8	38	18	18.4	5
RW15	Tetrachloroethene	1.2	21	1.2	9.8	5
RW15	Trichloroethene	1.9	12	1.9	5.2	5
RW16	Tetrachloroethene	2.2	38	2.2	15.8	5
RW16	Trichloroethene	3.8	7	3.8	5.7	5
RW17	Tetrachloroethene	6.5	43	13	15.1	5
RW17	Trichloroethene	2.6	44	2.7	20.4	5
RW18	Tetrachloroethene	<0.5	15	<0.5	6.5	5
RW18	Trichloroethene	<0.5	24	<0.5	8.8	5

Grace - Monitoring Wells Exceeding ROD Cleanup Goals for Last Five Years (ug/L)						
Well	Contaminant	Min	Max	Most Recent	Average(1)	Rod Cleanup Goal
RW19	Tetrachloroethene	9.2	33	9.2	19.2	5
RW19	Trichloroethene	1.9	30	1.9	10.4	5
RW20	Tetrachloroethene	5	31	9.6	10.9	5
RW20	Trichloroethene	1.6	6.9	5	5.4	5
RW21	Tetrachloroethene	<0.5	22	4.3	8.5	5
RW21	Trichloroethene	3.2	17	3.2	6.3	5
RW22	1,2-Dichloroethene	1.1	730	420	465.2	70
RW22	Tetrachloroethene	<0.5	6	<5	2.6	5
RW22	Trichloroethene	4.4	300	110	143.2	5
RW22	Vinyl Chloride	<1	9.4	<10	4.3	2
RW7	Tetrachloroethene	<0.5	12	<0.5	2.9	5
RW7	Trichloroethene	0.9	9.8	0.9	4.7	5
RW8	Tetrachloroethene	1.1	18	1.6	4.2	5
RW8	Trichloroethene	1.9	15	2	6.1	5
RW9	Tetrachloroethene	2.1	19	4.5	9.2	5

Notes:

< - Non-detect at specified laboratory reporting limit.

(1) - Average includes non-detects at 1/2 the laboratory reporting limit.

08 i.dwg

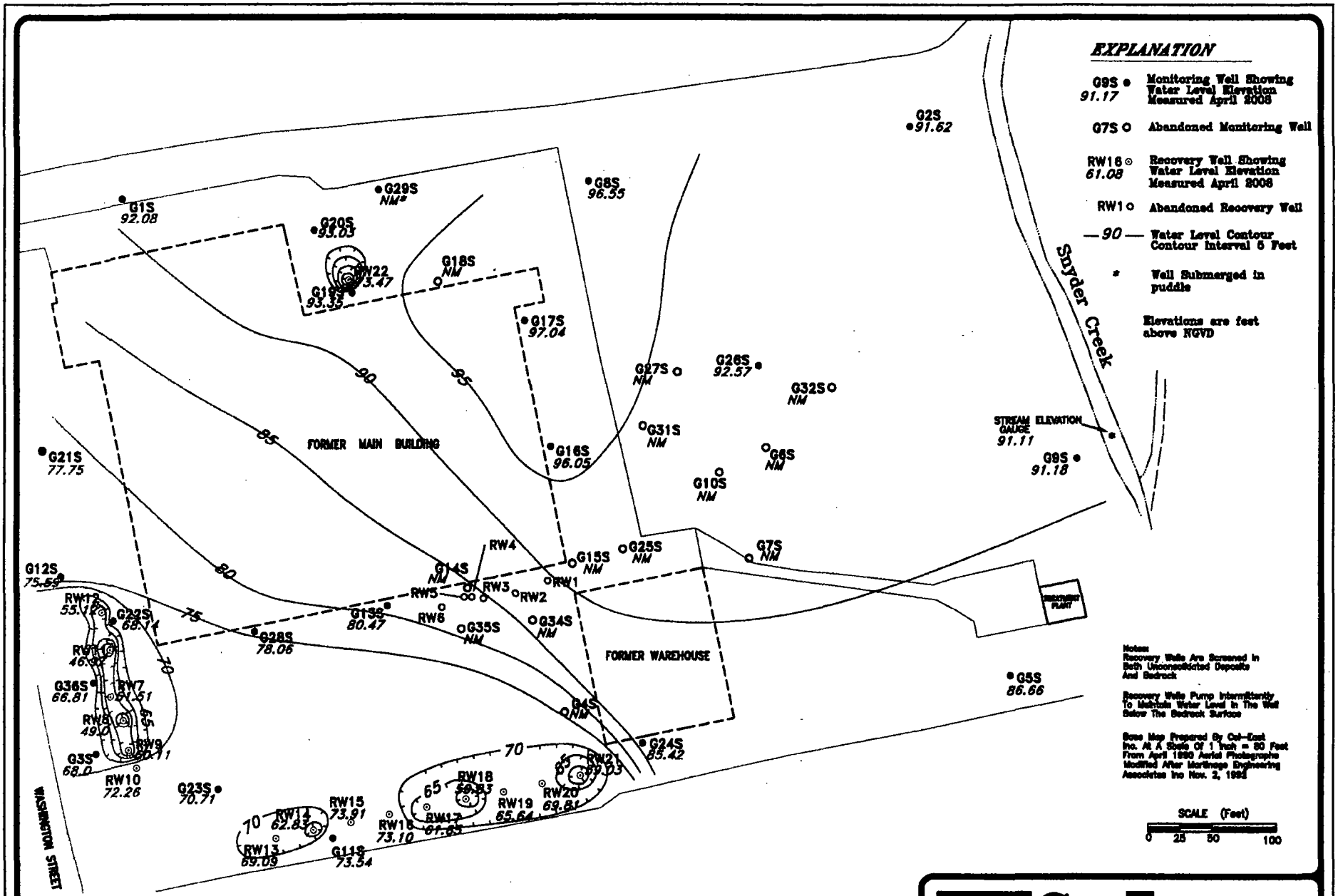


Figure 2-1 Water Table Map, April 14, 2008

Attachment 2.3

NEP Groundwater Data in Excess of ROD Cleanup Levels

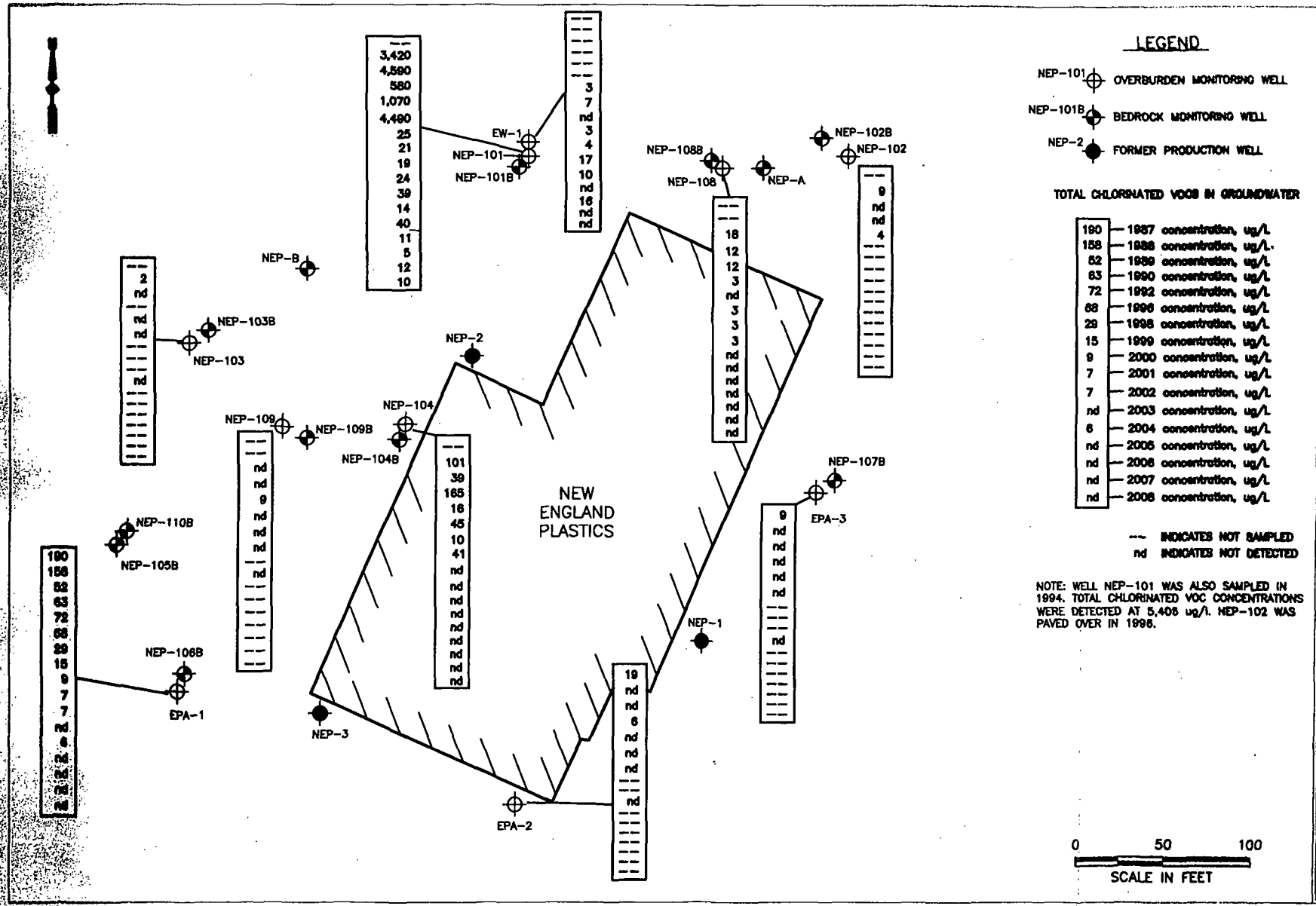
2004 to 2008

NEP - Monitoring Wells Exceeding ROD Cleanup Goals for Last Five Years (ug/L)						
Well	Contaminant	Min	Max	Most Recent	Average[1]	Rod Cleanup Goal
EPA-1	Tetrachloroethene	6	6	ND	6	5
EW-1	Tetrachloroethene	10	16	ND	13	5
NEP-101	Tetrachloroethene	5	40	10	15.6	5
NEP-104B	Tetrachloroethene	7	20	ND	11.8	5
NEP-106B	Tetrachloroethene	14	23	14	18.3	5
NEP-106B	Trichloroethene	5	7	5	6	5
NEP-108B	Tetrachloroethene	5	18	5	9.2	5
NEP-108B	Trichloroethene	5	6	ND	5.5	5

Notes:

ND - Compound not detected for listed contaminant.

(1) - Average is of detects only.


NEW ENGLAND PLASTICS
EW-1
NEP-101
NEP-101B
NEP-102B
NEP-102
NEP-108B
NEP-108
NEP-A
NEP-B
NEP-103B
NEP-103
NEP-2
NEP-104
NEP-104B
NEP-109
NEP-109B
NEP-107B
EPA-3
NEP-110B
NEP-105B
NEP-106B
EPA-1
NEP-1
NEP-3
EPA-2
LEGEND
NEP-101 OVERBURDEN MONITORING WELL
NEP-101B BEDROCK MONITORING WELL
NEP-2 FORMER PRODUCTION WELL
TOTAL CHLORINATED VOCS IN GROUNDWATER
190 — 1987 concentration, ug/L
158 — 1988 concentration, ug/L
52 — 1989 concentration, ug/L
63 — 1990 concentration, ug/L
72 — 1992 concentration, ug/L
68 — 1996 concentration, ug/L
29 — 1998 concentration, ug/L
15 — 1999 concentration, ug/L
9 — 2000 concentration, ug/L
7 — 2001 concentration, ug/L
7 — 2002 concentration, ug/L
nd — 2003 concentration, ug/L
6 — 2004 concentration, ug/L
nd — 2005 concentration, ug/L
nd — 2006 concentration, ug/L
nd — 2007 concentration, ug/L
nd — 2008 concentration, ug/L
--- INDICATES NOT SAMPLED
nd INDICATES NOT DETECTED
NOTE: WELL NEP-101 WAS ALSO SAMPLED IN 1994. TOTAL CHLORINATED VOC CONCENTRATIONS WERE DETECTED AT 5,408 ug/l. NEP-102 WAS PAVED OVER IN 1996.
0 50 100
SCALE IN FEET
WOODARD & CURRAN
35 NEW ENGLAND BUSINESS CENTER
ANDOVER, MASSACHUSETTS
978.794.9371 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS
HISTORICAL CHLORINATED VOC CONCENTRATIONS - OVERBURDEN
DESIGNED BY:
DRAWN BY: EMR
CHECKED BY:
NEW ENGLAND PLASTICS CORPORATION
WOBURN, MASSACHUSETTS
ANNUAL GROUNDWATER MONITORING REPORT
JOB NO. 99032
DATE: SEPT. 2008
SCALE: AS NOTED
DRAWING 1

Attachment 2.4

Wildwood Groundwater Data in Excess of ROD Cleanup Levels

2004 to 2007

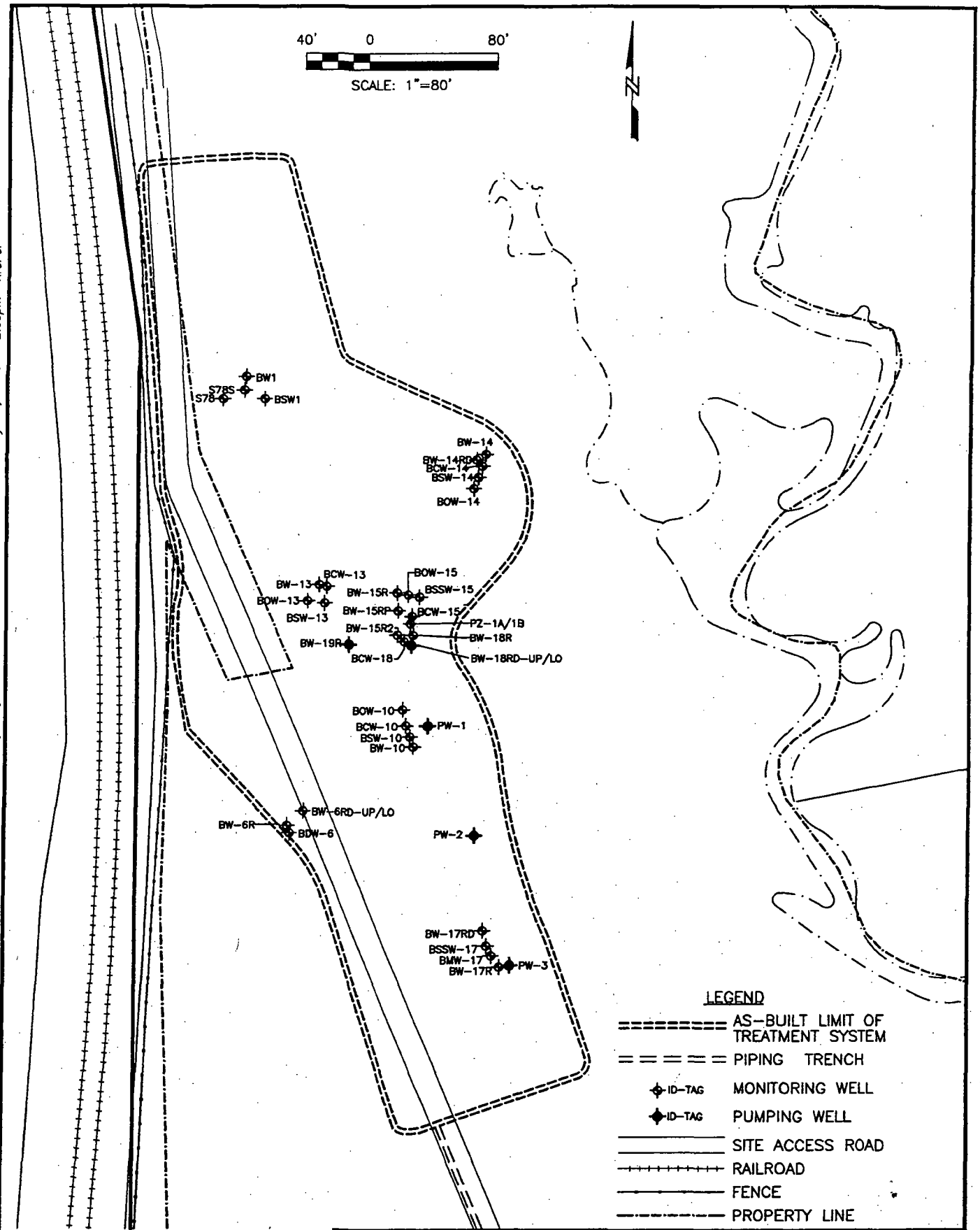
Wildwood - Monitoring Wells Exceeding ROD Cleanup Goals for Last Five Years (ug/L)						
Well	Contaminant	Min	Max	Most Recent	Average[1]	Rod Cleanup Goal
BCW-13	Trichloroethene	9.6	24	9.6	15.2	5
BOW-8	Tetrachloroethene	<1	6.5	1.8	1.6	5
BOW-8	Trichloroethene	<1	66	3.2	11.3	5
BSSW-15	Trichloroethene	5.5	10	5.5	7.4	5
BSW-1	Tetrachloroethene	1,700	6,100	5,400	3,950	5
BSW-1	Trichloroethene	3,700	11,000	5,400	6,150	5
BSW-1	Vinyl Chloride	<1	60	<1	15.6	2
BSW-13	Trichloroethene	1	64	2.0	9.2	5
BSW-6	Trichloroethene	45	990	150	300.9	5
BW-10	Tetrachloroethene	<1	7	<1	1.0	5
BW-10	Trichloroethene	4.2	750	5.3	62.1	5
BW-13	Trichloroethene	56	190	93	119.8	5
BW-14	1,1-Dichloroethane	<1	7	<1	2	5
BW-14	Trichloroethene	30	1,300	30	495	5
BW-14	Vinyl Chloride	<1	8	<1	1	2
BW-15RP	Trichloroethene	5	42	5.3	12.1	5
BW-17R	1,1-Dichloroethane	<1	12	1.9	2.7	5
BW-17R	Trichloroethene	130	250	160	179.3	5
BW-18RD(LO)	Chloroform	63	120	88	88.7	100
BW-18RD(LO)	1,1-Dichloroethane	37	94	71	63.7	5
BW-18RD(LO)	1,1-Dichloroethene	<1	22	14	6.3	7
BW-18RD(LO)	Tetrachloroethene	7	22	17	12.4	5
BW-18RD(LO)	Trichloroethene	7,000	21,000	13,000	13,414.3	5
BW-19R	Trichloroethene	99	190	190	133.6	5
BW-6R	Chloroform	6	6	6	5.9	100
BW-6R	Tetrachloroethene	11	17	15	14.3	5
BW-6R	1,1,1-Trichloroethen	220	240	220	230	200
BW-6R	Trichloroethene	6,600	11,000	6,600	8,233.3	5
BW-6RD(LO)	1,1-Dichloroethane	7.8	13	8.4	10	5
BW-6RD(LO)	Tetrachloroethene	7.2	45	9.7	19.4	5

Wildwood - Monitoring Wells Exceeding ROD Cleanup Goals for Last Five Years (ug/L)						
Well	Contaminant	Min	Max	Most Recent	Average[1]	Rod Cleanup Goal
BW-6RD(LO)	Trichloroethene	1,200	2,600	1,200	1,657.1	5
BW-8	Trichloroethene	12	18	12	14.8	5
PW-1	1,1-Dichloroethane	<1	28	1.7	4.6	5
PW-1	Tetrachloroethene	<1	6	<1	1.3	5
PW-1	Trichloroethene	14	3,700	200	575.6	5
PW-2	Trichloroethene	13	180	19	53.6	5
PW-3	Trichloroethene	22	670	670	180.4	5

Notes:

< - Non-detect at specified laboratory reporting limit.

(1) - Average includes non-detects at 1/2 the laboratory reporting limit.



RETEC

WELLS G & H
SUPERFUND SITE
BEATRICE-03564-750

DATE: 4/2005 | DRWN: BcV/CON

MONITORING WELL LOCATIONS WITHIN TREATMENT CELL

WOBURN, MASSACHUSETTS

FIGURE: 1-4

File: F:\PROJEC...eatrice\Wells G&H\03564\CAD\ANUAL-RPT-04_YEAR-6\035643S-AR04-1.dwg Layout: mW-LOC User: BVershon Plotted: May 02, 2005 - 2:03pm Xref's:

Attachment 2.5

Olympia Groundwater Data in Excess of ROD Cleanup Levels
Former Drum Disposal Area

2004 to 2009

L2009-175

Olympia - Monitoring Wells Exceeding ROD Cleanup Goals for Last Five Years (ug/L)						
Well	Contaminant	Min	Max	Most Recent	Average[1]	Rod Cleanup Goal
GEO-4	Trichloroethene	<0.5	2,500	<25	837.6	5
MW-011M	Trichloroethene	2	19	2	8.3	5
MW-011S	Trichloroethene	2	8	2	5	5
MW-014S	cis-1,2-Dichloroethene	29	280	280	126.7	70
MW-014S	Tetrachloroethene	3	120	11	48.7	5
MW-014S	Trichloroethene	6	810	27	179.5	5
MW-014S	Vinyl Chloride	6	31	30	15.8	2
MW-12	Trichloroethene	<0.5	32	22	13.6	5
MW-13	cis-1,2-Dichloroethene	260	710	440	422.5	70
MW-13	Tetrachloroethene	470	1,500	530	923.8	5
MW-13	Trichloroethene	160	6,400	6,300	3,794.3	5
MW-13	Vinyl Chloride	<20	50	<50	25.8	2
MW-200D	Chloroform	230	12,500	230	8,410	5
MW-200D	Trichloroethene	<50	870,000	<50	546,675	5
MW-200S	Trichloroethene	<25	14,000	<25	7,006.3	5
MW-201D	Trichloroethene	<5	11	<5	6.8	5
MW-201S	Trichloroethene	4	330	<10	113	5
MW-202D	Chloroform	150	1,000	150	575	5
MW-202D	Trichloroethene	<100	89,000	<100	44,525	5
MW-202S	Trichloroethene	<25	6,200	<25	3,106.3	5
MW-203D	Chloroform	17	250	<100	119.9	5
MW-203D	Tetrachloroethene	<25	250	200	148.1	5
MW-203D	Trichloroethene	<5	47,000	14,000	24,779.4	5
MW-203S	Trichloroethene	1	500	4	109.4	5
MW-204D	Trichloroethene	<50	460,000	<100	165,461.4	5
MW-204S	cis-1,2-Dichloroethene	<10	280	<10	165	70
MW-204S	Trichloroethene	<10	2,400	<10	1,182.5	5

Olympia - Monitoring Wells Exceeding ROD Cleanup Goals for Last Five Years (ug/L)						
Well	Contaminant	Min	Max	Most Recent	Average[1]	Rod Cleanup Goal
MW-205D	Tetrachloroethene	<25	1,250	<100	607	5
MW-205D	Trichloroethene	<25	120,000	<100	60,917	5
MW-205S	Trichloroethene	<0.5	12	<0.5	4.7	5
MW-206D	cis-1,2-Dichloroethene	<3	640	<50	345.8	70
MW-206D	Tetrachloroethene	<25	500	200	357.9	5
MW-206D	Trichloroethene	<25	100,000	<50	54,826.7	5
MW-206S	cis-1,2-Dichloroethene	<5	130	<5	66.3	70
MW-206S	Trichloroethene	<5	8,200	<5	4,101.3	5
MW-207D	Chloroform	<100	230	230	110	5
MW-207D	Trichloroethene	<50	8,100	<50	5,341.7	5
MW-207S	cis-1,2-Dichloroethene	<5	1,700	<10	414.8	70
MW-207S	Tetrachloroethene	<10	110	<10	46.3	5
MW-207S	Trichloroethene	<10	3,700	<10	1,147.3	5
MW-207S	Vinyl Chloride	<5	320	<10	65.3	2
MW-208D	Trichloroethene	<25	170,000	<100	52,015.6	5
MW-208S	cis-1,2-Dichloroethene	<10	1,300	439.2	<10	70
MW-208S	Trichloroethene	<10	1,100	<10	372.5	5
MW-208S	Vinyl Chloride	<10	95	<10	37.5	2
MW-209D	Chloroform	<50	50	50	37.5	5
MW-209D	Trichloroethene	<10	1,600	<10	802.5	5
MW-209S	cis-1,2-Dichloroethene	<5	1,300	<5	420.4	70
MW-209S	Trichloroethene	<5	520	<5	181.5	5
MW-209S	Vinyl Chloride	<5	270	<5	91.7	2
MW-210D	Chloroform	<25	59	59	35.8	5
MW-210D	cis-1,2-Dichloroethene	<5	1,900	<5	951.3	70
MW-210D	Trichloroethene	<5	650	<5	326.3	5
MW-210S	cis-1,2-Dichloroethene	<0.5	3,500	<0.5	1,482.6	70

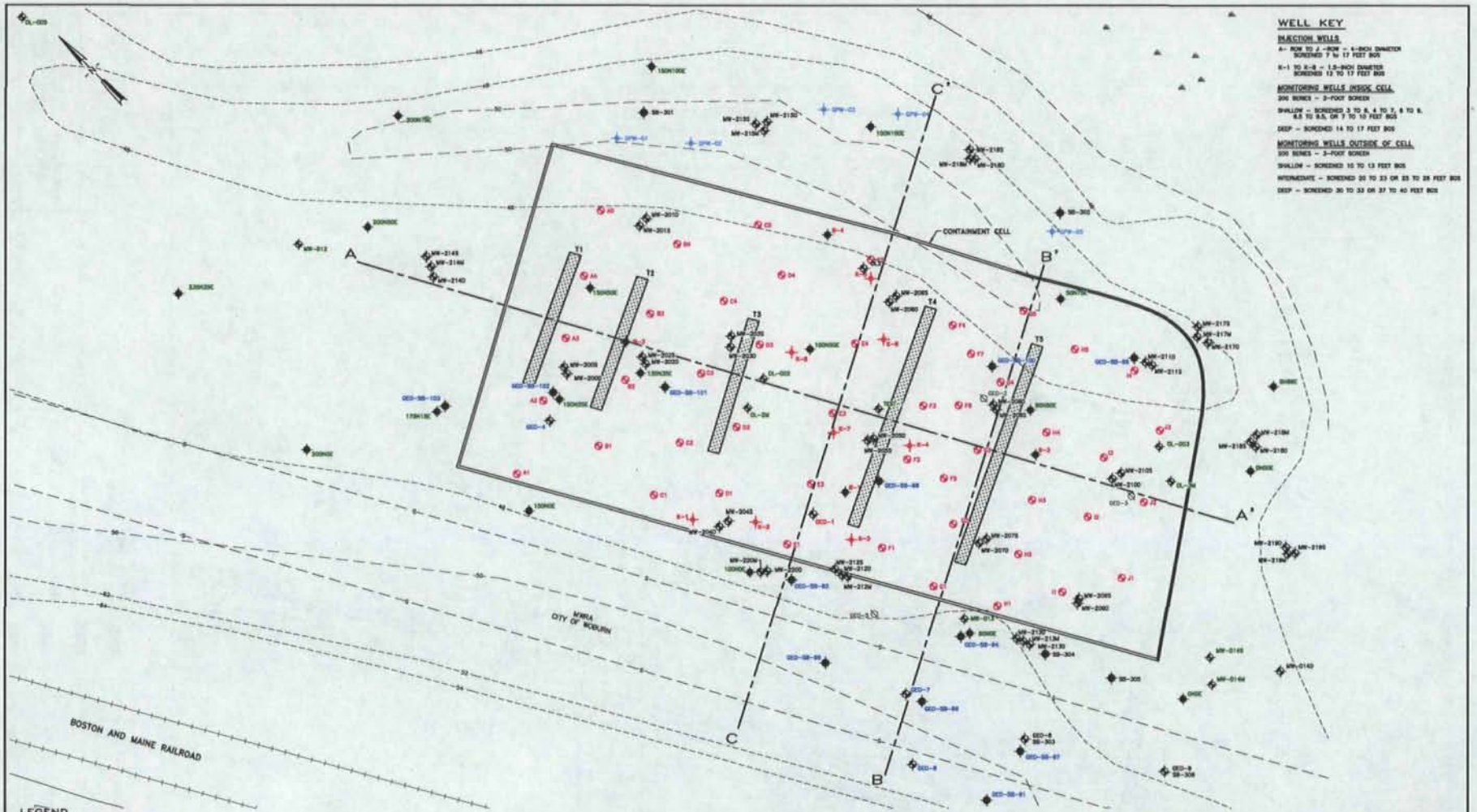
Olympia - Monitoring Wells Exceeding ROD Cleanup Goals for Last Five Years (ug/L)						
Well	Contaminant	Min	Max	Most Recent	Average[1]	Rod Cleanup Goal
MW-210S	Trichloroethene	<25	2,400	30	720.5	5
MW-210S	Vinyl Chloride	<0.5	1,100	<0.5	292.8	2
MW-211D	Chloroform	<5	30	28	21.4	5
MW-211D	cis-1,2-Dichloroethene	<0.5	830	<0.5	245.2	70
MW-211D	Tetrachloroethene	<0.5	25	<0.5	8.9	5
MW-211D	Trichloroethene	<0.5	3,300	<0.5	863.1	5
MW-211S	cis-1,2-Dichloroethene	0.7	2	1.6	2	70
MW-211S	Trichloroethene	1	39	2	10.8	5
MW-211S	Vinyl Chloride	<0.5	27	0.8	7.2	2
MW-212M	Trichloroethene	<1	7	3.5	7	5
MW-212S	cis-1,2-Dichloroethene	0.7	310	<25	70.1	70
MW-212S	Tetrachloroethene	<25	1,300	<25	850.3	5
MW-212S	Trichloroethene	<25	2,300	<25	1,459.1	5
MW-213S	cis-1,2-Dichloroethene	47	200	81	124	70
MW-213S	Tetrachloroethene	120	400	400	285.7	5
MW-213S	Trichloroethene	70	6,000	6,000	1,543.3	5
MW-215S	cis-1,2-Dichloroethene	<3	430	<50	155.2	70
MW-215S	Tetrachloroethene	<50	2,900	190	1,418.5	5
MW-215S	Trichloroethene	<3	6,200	<50	2,767.7	5
MW-216M	Trichloroethene	<0.5	10	<0.5	3.7	5
MW-216S	Chloroform	300	500	300	366.7	5
MW-216S	Tetrachloroethene	<250	740	<250	401.7	5
MW-216S	Trichloroethene	20,000	98,000	26,000	49,111.1	5
MW-217S	cis-1,2-Dichloroethene	2.0	550	510	370.3	70
MW-217S	Tetrachloroethene	<0.5	12	<5	5.9	5
MW-217S	Trichloroethene	3	190	170	113.3	5
MW-218S	cis-1,2-Dichloroethene	1	93	1	33.7	70

Olympia - Monitoring Wells Exceeding ROD Cleanup Goals for Last Five Years (ug/L)						
Well	Contaminant	Min	Max	Most Recent	Average(1)	Rod Cleanup Goal
MW-218S	Trichloroethene	0.5	27	0.5	6.1	5
MW-218S	Vinyl Chloride	<0.5	6	<0.5	3.9	2
MW-219M	cis-1,2-Dichloroethene	16	210	16	76.8	70
MW-219M	Trichloroethene	2	11	2	5.8	5
MW-219M	Vinyl Chloride	3	12	3	8.2	2
MW-219S	Vinyl Chloride	<0.5	5	<0.5	1.2	2
OL-002	cis-1,2-Dichloroethene	<3	76	<3	27.5	70
OL-002	Trichloroethene	41	3,200	41	1,106.7	5
OL-003	Chloroform	7	12.5	<25	10.7	5
OL-003	cis-1,2-Dichloroethene	<25	480	<25	314.2	70
OL-003	Tetrachloroethene	13	13	<25	12.7	5
OL-003	Trichloroethene	<25	930	<25	437.5	5
OL-003	Vinyl Chloride	<25	82	<25	57.2	2
OL-2M	Tetrachloroethene	<0.5	125	1.0	12.2	5
OL-2M	Trichloroethene	<1	22,000	2.0	1,954.4	5
OL-3M	Chloroform	<1	6	6.0	3.3	5
TEST-1	cis-1,2-Dichloroethene	<0.5	400	<0.5	263.4	70
TEST-1	Trichloroethene	<0.5	3,600	<0.5	2,366.8	5

Notes:

< - Non-detect at specified laboratory reporting limit.

(1) - Average includes non-detects at 1/2 the laboratory reporting limit.



WELL KEY

INJECTION WELLS

A– ROW TO J –ROW – 4-INCH DIAMETER SCREENED 7 to 17 FEET BGS

K-1 TO K-8 – 1.5-INCH DIAMETER SCREENED 12 TO 17 FEET BGS

MONITORING WELLS INSIDE CELL

200 SERIES – 3-FOOT SCREEN

SHALLOW – SCREENED 3 TO 6, 4 TO 7, 6 TO 9, 8.5 TO 9.5, OR 7 TO 10 FEET BGS

DEEP – SCREENED 14 TO 17 FEET BGS

MONITORING WELLS OUTSIDE OF CELL

300 SERIES – 3-FOOT SCREEN

SHALLOW – SCREENED 10 TO 13 FEET BGS

INTERMEDIATE – SCREENED 20 TO 23 OR 25 TO 28 FEET BGS

DEEP – SCREENED 30 TO 33 OR 37 TO 40 FEET BGS

LEGEND

- GED-6 — MONITORING WELL–GEOINSIGHT 2003 INVESTIGATION
- GED-1 — DEEP GREENBURGH WELL–GEOINSIGHT 1998 INVESTIGATION
- MW-1 — MONITORING WELL–PREVIOUS INVESTIGATIONS
- GED-3 — MONITORING WELL – DESTROYED
- MW-2145 — REMEDIAL MONITORING WELL – GEOINSIGHT 2002
- 04 — INJECTION WELL LOCATION AND DESIGNATION
- K-1 — INJECTION WELL LOCATION AND DESIGNATION (AUGUST, 2007)
- GED-6/ SB-303 — MONITORING WELL/SOIL BORING LOCATION AND DESIGNATION (2007)
- DPW-01 — DISCRETE GROUND WATER SAMPLING POINTS
- SB-302 — APPROXIMATE LOCATION OF SOIL BORINGS (AUGUST, 2007)
- SUBSURFACE SEWER LINES
- APPROXIMATE LOCATION OF WETLAND AREA
- 54 — GROUND SURFACE ELEVATION CONTOUR IN FEET
- SHEETPILE WALL – 20 FEET DEEP
- SHEETPILE WALL – 25 FEET DEEP
- SHALLOW INJECTION TRENCH
- A---A' — CROSS SECTIONS

NOTES:

1. BEARINGS ARE REFERENCED TO THE MASSACHUSETTS MAINLAND COORDINATE SYSTEM (NAD 27) HOLDING COASTAL GEODETIC SURVEY (CGS) MONUMENTS 414 AND 11GNS. THE COORDINATES WERE DERIVED UTILIZING THE GLOBAL POSITIONING SYSTEM (GPS) FAST STATIC SURVEY METHODS.

2. ELEVATIONS ARE REFERENCED TO NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988, HOLDING CGS MONUMENT U33.

3. BASE MAPPING IS COMPILED FORM CITY OF WOBURN TOPOGRAPHIC MAPPING. FIELD TOPOGRAPHY WAS PERFORMED ON APRIL 23, 2002.

4. REFERENCE IS MADE TO THE FOLLOWING MAPS:

A. "RIGHT-OF-WAY AND TRACK MAP, BOSTON AND LOWELL R.R. CORP., OPERATED BY THE BOSTON AND MAINE R.R., STATION 548+31 TO STATION 601+11," SCALE 1" = 100', DATED JUNE 30, 1914. VALUATION 13.1/X

B. "PLAN OF LAND, WOBURN, MASS., BELONGING TO DANIEL J. QUINN," SCALE 1" = 40', DATED FEBRUARY 1946, PREPARED BY GEO. W. OLSON, MAP ON FILE IN THE MIDDLESEX REGISTRY OF DEEDS AS PLAN #287.

C. "PLAN OF LAND IN WOBURN, MASS.," SCALE 1" = 80', DATED JUNE 6, 1963, PREPARED BY SCHOFIELD BROTHERS.

D. "SUBDIVISION PLAN OF LAND IN WOBURN, H. KINGMAN ABBOTT, SURVEYOR," SEPTEMBER 20, 1958, LAND COURT DOCUMENT 35070.

E. "SUBDIVISION PLAN OF LAND IN WOBURN," INVITES ENGINEERING, INC., SURVEYORS, DATED JANUARY 14, 1963, LAND COURT DOCUMENT 35070.

F. "PLAN OF LAND IN WOBURN," H. KINGMAN ABBOTT, SURVEYOR, JANUARY 8, 1992, NOVEMBER 1998, LAND COURT DOCUMENT 32181A.

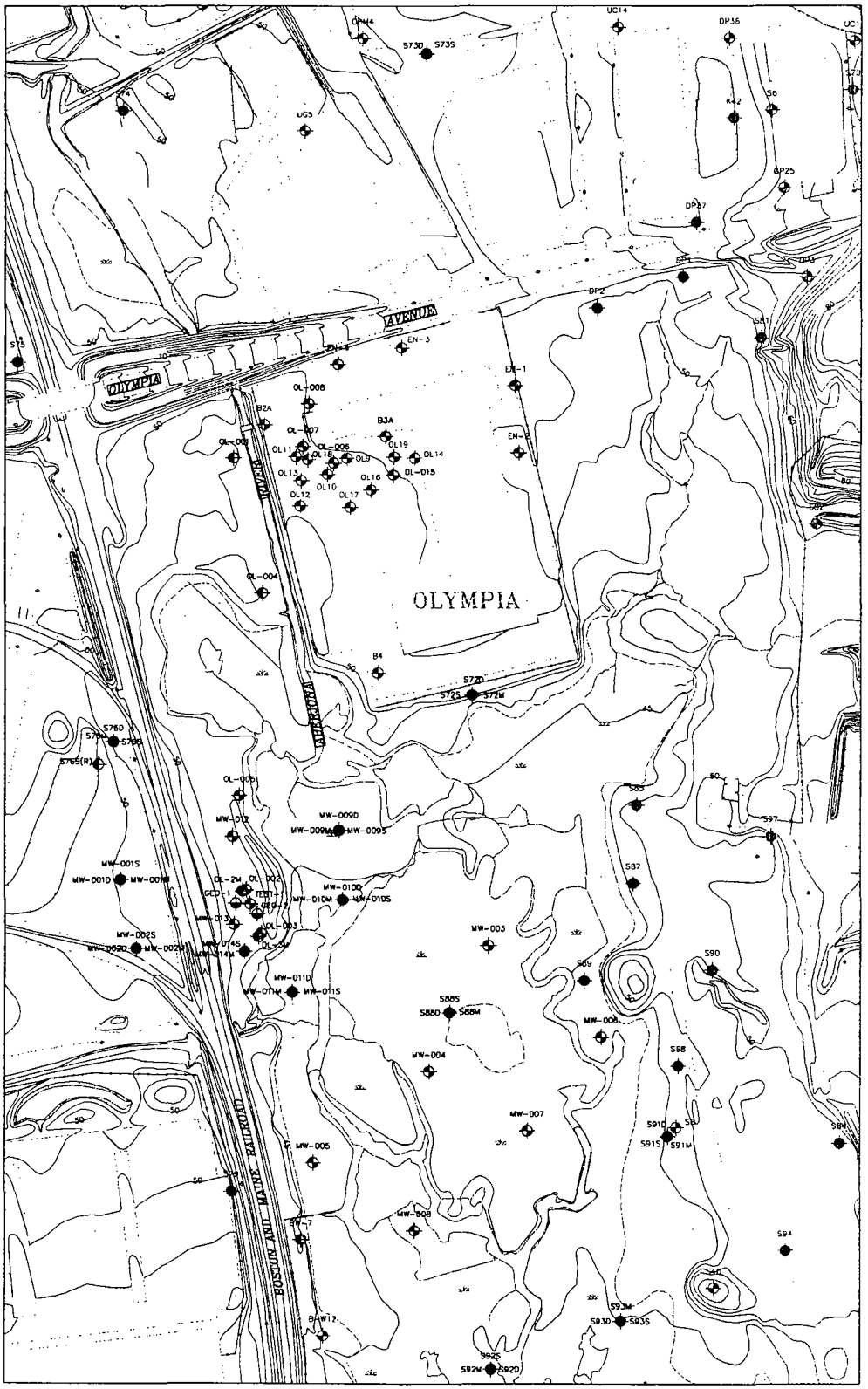
DRAFT

SCALE IN FEET

CLIENT: OLYMPIA NOMINEE TRUST			
PROJECT: 60 OLYMPIA STREET			
TITLE: SITE PLAN			
DESIGNED: CAB	DRAWN: NMT	CHECKED: CAB	APPROVED: MJW
SCALE: 1" = 10'	DATE: 12/12/07	FILE NO.: 24910100	PROJECT NO.: 2491

GeoInsight
Practical in Nature

FIGURE NO.: 1



LEGEND

- SHALLOW MONITORING WELL
- INTERMEDIATE MONITORING WELL
- DEEP MONITORING WELL
- BEDROCK MONITORING WELL
- MULTI-LEVEL MONITORING WELL
- NEWLY INSTALLED MONITORING WELLS-SAMPLED
- CENTRAL AREA/FORMER DRUM DISPOSAL AREA WELLS-SAMPLED
- PREVIOUSLY INSTALLED OLYMPIA PROPERTY MONITORING WELLS-SAMPLED
- PREVIOUSLY INSTALLED MONITORING WELLS-NOT SAMPLED

N

0 100 200 300 400

SCALE IN FEET

FIGURE 7
GROUNDWATER
MONITORING WELL LOCATIONS

WELLS CAN OUT
OLYMPIA PROPERTY
SUPERFUND SITE
WOBURN, MASSACHUSETTS

Metcalf & Eddy

TRC

Boott Mills South
Foot of John Street
Lowell, MA 01852
978-970-5600

TRC PROJ. NO.: 02136-0370-01463

EPA CONTRACT NO.: 68-W6-0042

RAC SUBCONTRACT NO.: 107061

ATTACHMENT 3

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TRC, 2006. Baseline Human Health and Ecological Risk Assessment, Southwest Properties, Wells G&H Superfund Site, Operable Unit 2, Woburn, Massachusetts. Prepared by Metcalf & Eddy, Inc. Team Subcontractor TRC Environmental Corporation, March 2006.

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Woodard & Curran, 2003. Groundwater Monitoring Report, New England Plastics Corporation, Woodard & Curran, November 25, 2003.

Woodard & Curran, 2008. Annual Groundwater Monitoring Report. New England Plastics Corporation. Woodard & Curran, 2008.

ATTACHMENT 4

FIVE-YEAR REVIEW SITE INSPECTION CHECKLISTS

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: UniFirst	**Date of inspection:** June 11, 2009
Location and Region: Woburn USEPA Region 1	**EPA ID:** Wells G&H MAD980732168
Agency, office, or company leading the five-year review: TRC / Metcalf & Eddy, Inc.	**Weather/temperature:** Cloudy, drizzle, cool

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ■ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other _____
- ☐ Monitored natural attenuation
- ■ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ■ Inspection team roster attached Table 1 ■ Site map attached Figure 1

II. INTERVIEWS (Check all that apply)

1. **O&M Site Manager** Timothy M. Cosgrave O&M Manager, Harvard Project Services
   Name Title Date
   Interviewed ■ at site ☐ at office ☐ by phone Phone no. 978-772-1105
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

Team members: on attached Table 1

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

   Agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone no.
   Problems; suggestions; ☐ Report attached _____

   Agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone no.
   Problems; suggestions; ☐ Report attached _____

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ■ O&M manual — ■ Readily available — ■ Up to date — ☐ N/A
   - ☐ As-built drawings — ☐ Readily available — ☐ Up to date — ☐ N/A
   - ■ Maintenance logs — ☐ Readily available — ■ Up to date — ☐ N/A

   Remarks Maintenance record is maintained in an Access database and hardcopy is kept off-site. O&M manual was on-site and recently updated (December 2008).

2. **Site-Specific Health and Safety Plan** — ■ Readily available — ■ Up to date — ☐ N/A
   - ☐ Contingency plan/emergency response plan — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks HASP was on-site and very recently updated (6/5/2009).

3. **O&M and OSHA Training Records** — ■ Readily available — ☐ Up to date — ☐ N/A

   Remarks

4. **Permits and Service Agreements**
   - ☐ Air discharge permit None — ☐ Readily available — ☐ Up to date — ■ N/A
   - ☐ Effluent discharge None — ☐ Readily available — ☐ Up to date — ■ N/A
   - ☐ Waste disposal, POTW None — ☐ Readily available — ☐ Up to date — ■ N/A
   - ☐ Other permits None — ☐ Readily available — ☐ Up to date — ■ N/A

   Remarks

5. **Gas Generation Records** — ☐ Readily available — ☐ Up to date — ■ N/A

   Remarks

6. **Settlement Monument Records** — ☐ Readily available — ☐ Up to date — ■ N/A

   Remarks

7. **Groundwater Monitoring Records** — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks Groundwater monitoring records are kept off-site.

8. **Leachate Extraction Records** — ☐ Readily available — ☐ Up to date — ■ N/A

   Remarks

9. **Discharge Compliance Records**
   - ☐ Air — ☐ Readily available — ☐ Up to date — ■ N/A
   - ■ Water (effluent) — ☐ Readily available — ☐ Up to date — ☐ N/A

Remarks Discharge compliance records are kept off-site.

10. **Daily Access/Security Logs** ■ Readily available ■ Up to date ☐ N/A
Remarks A site visitor log is maintained on-site.

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ■ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other Harvard Project Services, contractor to UniFirst, operates the groundwater extraction and treatment system.

2. **O&M Cost Records**
☐ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place contract with Harvard Project Services
Original O&M cost estimate not sure ☐ Breakdown attached

Total annual cost by year for review period if available

Costs are approximately $125,000 per year ± $20,000

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons In 2008, a lightning strike destroyed wiring and well pump, which had to be replaced. Though not unexpected, carbon tanks were replaced.

V. ACCESS AND INSTITUTIONAL CONTROLS ■ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ■ Gates secured ☐ N/A
Remarks Fencing OK; chain link

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks Authorized access sign on door to treatment facility.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No ■ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ■ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) _____
Frequency _____
Responsible party/agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No ■ N/A
Reports are verified by the lead agency ☐ Yes ☐ No ■ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ■ N/A
Violations have been reported ☐ Yes ☐ No ■ N/A
Other problems or suggestions ☐ Report attached

2. **Adequacy** ☐ ICs are adequate* ☐ ICs are inadequate ■ N/A
Remarks _____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☐ No vandalism evident
Remarks None

2. **Land use changes on site** ☐ N/A
Remarks None

3. **Land use changes off site** ☐ N/A
Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A
Remarks Parking lot condition OK

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS ☐ Applicable ■ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent _____ Depth _____
Remarks

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
Lengths_____ Widths_____ Depths_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
Areal extent_____ Depth_____
Remarks_____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
Remarks_____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
Areal extent_____ Height_____
Remarks_____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent_____
☐ Ponding ☐ Location shown on site map Areal extent_____
☐ Seeps ☐ Location shown on site map Areal extent_____
☐ Soft subgrade ☐ Location shown on site map Areal extent_____
Remarks_____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
Areal extent_____
Remarks_____

B. Benches ☐ Applicable ☐ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)
Remarks_____

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

C. Letdown Channels ☐ Applicable ■ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)
Remarks_____

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
Areal extent_____ Depth_____
Remarks_____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
Material type_____ Areal extent_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Areal extent_____ Depth_____
Remarks_____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☐ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations ☐ Applicable ■ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks_____

2. **Gas Monitoring Probes**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks_____

E. Gas Collection and Treatment ☐ Applicable ■ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks_____

F. Cover Drainage Layer ☐ Applicable ■ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks_____

G. Detention/Sedimentation Ponds ☐ Applicable ■ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
☐ Siltation not evident
Remarks_____

2. **Erosion** Areal extent_____ Depth_____
☐ Erosion not evident

Remarks_____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks_____

4. **Dam** ☐ Functioning ☐ N/A
Remarks_____

H. Retaining Walls ☐ Applicable ■ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks_____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ■ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks_____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ■ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. **Performance Monitoring** Type of monitoring_____
☐ Performance not monitored
Frequency_____ ☐ Evidence of breaching
Head differential_____
Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ■ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ■ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ■ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks __There were some pump issues at the time of the previous 5-year review. Well piping was replaced with plastic and performance improved.

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ■ Good condition ☐ Needs Maintenance
   Remarks __Maintained and replaced as needed. Some piping and flow switches in plant replaced last year.

3. **Spare Parts and Equipment**
   ■ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ■ N/A

1. **Collection Structures, Pumps, and Electrical**
   ☐ Good condition ☐ Needs Maintenance
   Remarks

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks

3. **Spare Parts and Equipment**
   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks

C. Treatment System ■ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal None ☐ Oil/water separation None ☐ Bioremediation None
   ☐ Air stripping None ■ Carbon adsorbers
   Filters Multimedia
   ☐ Additive (*e.g.*, chelation agent, flocculent) None
   ☐ Others
   ■ Good condition ☐ Needs Maintenance
   ☐ Sampling ports properly marked and functional Yes
   ☐ Sampling/maintenance log displayed and up to date On computer
   ☐ Equipment properly identified Yes
   ☐ Quantity of groundwater treated annually varies
   ☐ Quantity of surface water treated annually N/A
   Remarks

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A ■ Good condition ☐ Needs Maintenance
   Remarks

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ■ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks

4. **Discharge Structure and Appurtenances**
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks Actual tie-in to storm sewer has not been observed. Effluent piping runs underground beneath Olympia Ave.

5. **Treatment Building(s)**
☐ N/A ■ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks

6. **Monitoring Wells** (pump and treatment remedy)
■ Properly secured/locked ☐ Functioning ■ Routinely sampled (annually) ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks Condition of flush-mounted road boxes and concrete pads appeared adequate. Wells were not opened during inspection.

D. Monitoring Data

Monitoring Data
■ Is routinely submitted on time ■ Is of acceptable quality

Monitoring data suggests: *According to Harvard Project Services
■ Groundwater plume is effectively contained * ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ■ N/A
Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction. None

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The goal of the groundwater treatment system is to contaminated groundwater containment. No observations were made during the inspection or interview with Tim Cosgrave (Harvard Project Services) that call into question the effectiveness or function of the remedy.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

The O&M Manual was recently updated. O&M staff visit the site on a weekly basis. There were no concerns that call into question the protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

No unexpected changes in cost or scope of O&M were reported by Tim Cosgrave. Tim also indicated that the system has had minimal downtime over the past 5 years.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None based on site inspection alone.

Table 1. UniFirst Inspection Team Rooster

5-Year Inspection Team Members	**Company**
N. Scott Buchanan	TRC
Cindy Castleberry	Metcalf & Eddy
Interviewed PRP Staff	
Timothy M. Cosgrave	Harvard Project Services

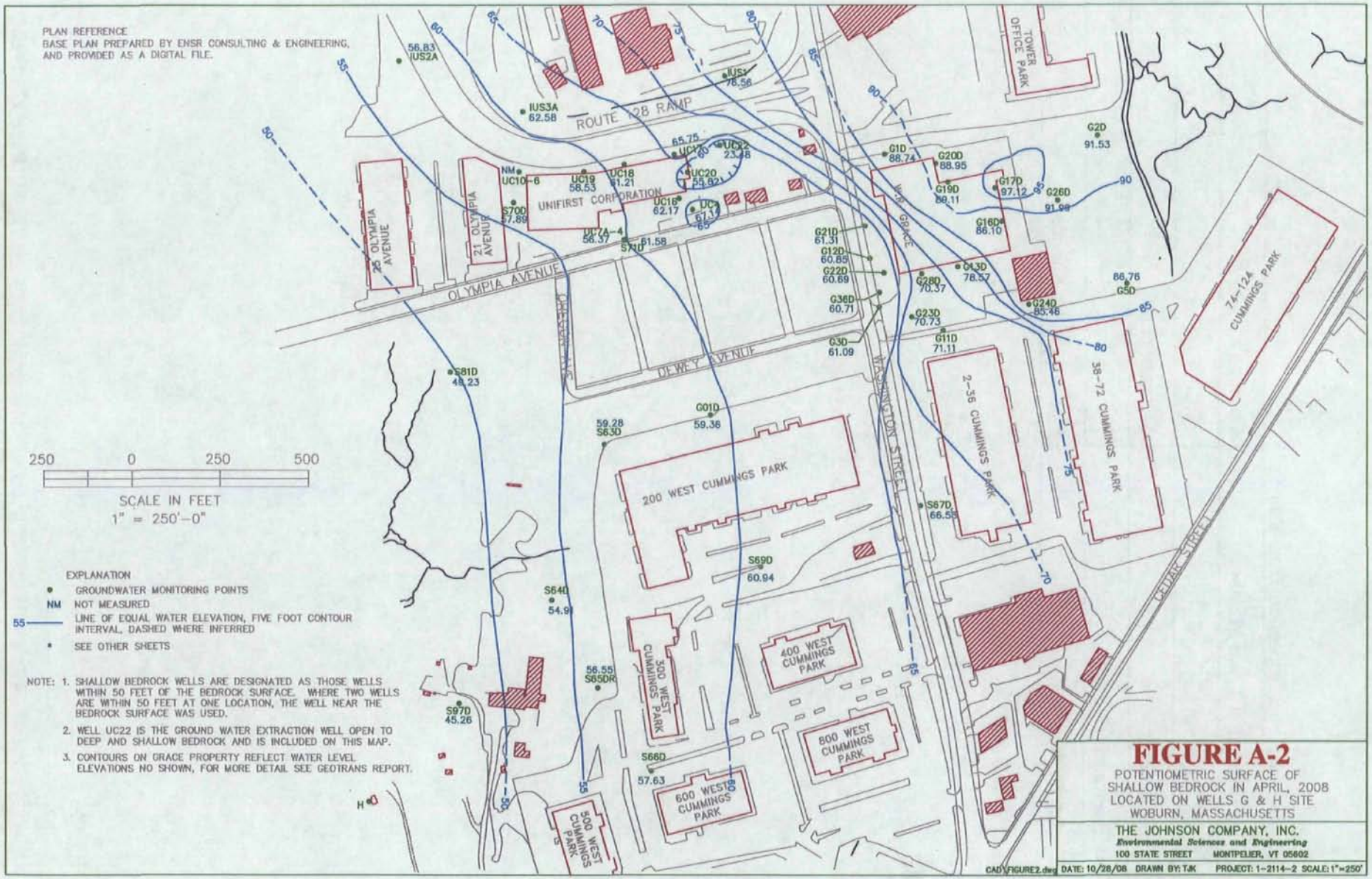


FIGURE A-2

POTENTIOMETRIC SURFACE OF SHALLOW BEDROCK IN APRIL, 2008 LOCATED ON WELLS G & H SITE WOBURN, MASSACHUSETTS

THE JOHNSON COMPANY, INC.
Environmental Sciences and Engineering
100 STATE STREET MONTPELIER, VT 05602

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: W. R. Grace	**Date of inspection:** June 16, 2009
Location and Region: Woburn USEPA Region 1	**EPA ID:** Wells G&H MAD980732168
Agency, office, or company leading the five-year review: TRC / Metcalf & Eddy, Inc.	**Weather/temperature:** Cloudy to sunny, warm

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ■ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other _____
- ☐ Monitored natural attenuation
- ■ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ■ Inspection team roster attached Table 1 ■ Site map attached Figure 1

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Maryellen C. Johns (Name) Senior Project Manager, Remedium Group, Inc (Title)
   Interviewed ■ at site ☐ at office ☐ by phone Phone no.
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** Van Sawyer (Name) Technical Services Manager, Groundwater & Environmental Services, Inc. (Title)
   Interviewed ■ at site ☐ at office ☐ by phone Phone no. 978-392-0090
   Problems, suggestions; ☐ Report attached _____

Team members on attached Table 1

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

   Agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone no.
   Problems; suggestions; ☐ Report attached _____

   Agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone no.
   Problems; suggestions; ☐ Report attached _____

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ■ O&M manual Dated 10/4/02 ■ Readily available ■ Up to date ☐ N/A
   - ■ As-built drawings Offsite ☐ Readily available ■ Up to date ☐ N/A
   - ■ Maintenance logs _____ ■ Readily available ■ Up to date ☐ N/A

   Remarks As-built drawings for current system layout are kept off-site. Maintenance logs are kept in file cabinet in treatment plant.

2. **Site-Specific Health and Safety Plan** ■ Readily available ■ Up to date ☐ N/A
   - ☐ Contingency plan/emergency response plan ■ Readily available ■ Up to date ☐ N/A

   Remarks Health & safety plan is dated 9/12/06.

3. **O&M and OSHA Training Records** ☐ Readily available ■ Up to date ☐ N/A

   Remarks Van Sawyer (GES) keeps OSHA training certification cards in his wallet. None are maintained on-site.

4. **Permits and Service Agreements**

☐ Air discharge permit	None	☐ Readily available	☐ Up to date	☐ N/A
☐ Effluent discharge	None	☐ Readily available	☐ Up to date	☐ N/A
☐ Waste disposal, POTW	None	☐ Readily available	☐ Up to date	☐ N/A
☐ Other permits	None	☐ Readily available	☐ Up to date	☐ N/A

   Remarks There is an Order of Conditions from the Woburn Conservation Commission. Marycllen says most of the requirements have been satisfied but annual surface water sampling in Snyder Creek continues to be performed. Grace has asked the ConCom to allow the surface water sampling to be discontinued.

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ■ N/A

   Remarks _____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ■ N/A

   Remarks _____

7. **Groundwater Monitoring Records** ☐ Readily available ☐ Up to date ☐ N/A

   Remarks Maintained off-site at GeoTrans' office.

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ■ N/A
Remarks

9. **Discharge Compliance Records**
☐ Air ☐ Readily available ☐ Up to date ■ N/A
■ Water (effluent) ☐ Readily available ■ Up to date ☐ N/A
Remarks Maintained off-site at GeoTrans' office.

10. **Daily Access/Security Logs** ■ Readily available ■ Up to date ☐ N/A
Remarks Current access logs are on-site.

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ■ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other At the time of the Site visit, Grace contracted with GES for routine O&M.

2. **O&M Cost Records**
☐ Readily available No ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate _____ ☐ Breakdown attached

About $120,000-150,000 per year over the past 5 years.

Total annual cost by year for review period if available

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: No

V. ACCESS AND INSTITUTIONAL CONTROLS ■ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ■ Gates secured ☐ N/A
   Remarks No fencing present in back of property near Snyder Creek

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
   Remarks No security system alarm or signage observed.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**
   Site conditions imply ICs not properly implemented ☐ Yes ☐ No ■ N/A
   Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ■ N/A

   Type of monitoring (*e.g.*, self-reporting, drive by) _____
   Frequency _____
   Responsible party/agency _____
   Contact _____ _____ _____ _____
   Name Title Date Phone no.

   Reporting is up-to-date ☐ Yes ☐ No ■ N/A
   Reports are verified by the lead agency ☐ Yes ☐ No ■ N/A

   Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ■ N/A
   Violations have been reported ☐ Yes ☐ No ■ N/A
   Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☐ ICs are adequate* ☐ ICs are inadequate ■ N/A
   Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ■ No vandalism evident
   Remarks None

2. **Land use changes on site** ☐ N/A
   Remarks Former manufacturing building and warehouse were demolished. There is no current use other than the treatment plant. Land use may change in future if property is sold and developed.

3. **Land use changes off site** ☐ N/A
   Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ■ Roads adequate ☐ N/A
   Remarks Access to treatment plant is drivable. There are cracks and weeds growing through pavement. Roads appear adequate for current site uses.

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS ☐ Applicable ■ N/A

A. Landfill Surface ☐ Applicable ■ N/A

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent _____ Depth _____
   Remarks _____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths _____ Widths _____ Depths _____
   Remarks _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent _____ Depth _____
   Remarks _____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent _____ Depth _____
   Remarks _____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks _____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks _____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent _____ Height _____
   Remarks _____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
   ☐ Wet areas ☐ Location shown on site map Areal extent _____
   ☐ Ponding ☐ Location shown on site map Areal extent _____
   ☐ Seeps ☐ Location shown on site map Areal extent _____
   ☐ Soft subgrade ☐ Location shown on site map Areal extent _____
   Remarks _____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability

Areal extent_____
Remarks_____

B. Benches ☐ Applicable ■ N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

C. Letdown Channels ☐ Applicable ■ N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
Areal extent_____ Depth_____
Remarks_____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
Material type_____ Areal extent_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Areal extent_____ Depth_____
Remarks_____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☐ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations ☐ Applicable ■ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks_____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks_____

E. Gas Collection and Treatment ☐ Applicable ■ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks_____

F. Cover Drainage Layer ☐ Applicable ■ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks_____

G. Detention/Sedimentation Ponds ☐ Applicable ■ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
   ☐ Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   ☐ Erosion not evident
   Remarks_____

3. **Outlet Works** ☐ Functioning ☐ N/A
   Remarks_____

4. **Dam** ☐ Functioning ☐ N/A
   Remarks_____

H. Retaining Walls ☐ Applicable ■ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ■ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
   ☐ Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** ☐ Functioning ☐ N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ■ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

Areal extent_____ Depth_____
Remarks_____

2. **Performance Monitoring** Type of monitoring_____
☐ Performance not monitored
Frequency_____ ☐ Evidence of breaching
Head differential_____
Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ■ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ■ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
■ Good condition ■ All required wells properly operating ☐ Needs Maintenance ☐ N/A
Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
■ Good condition ☐ Needs Maintenance
Remarks

3. **Spare Parts and Equipment**
■ Readily available ■ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks Extra pumps are available on site

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ■ N/A

1. **Collection Structures, Pumps, and Electrical**
☐ Good condition ☐ Needs Maintenance
Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____

C. Treatment System ■ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ■ Carbon adsorbers
Filters Bag
☐ Additive (*e.g.*, chelation agent, flocculent) None
☐ Others _____
☐ Good condition ☐ Needs Maintenance
■ Sampling ports properly marked and functional Yes
■ Sampling/maintenance log displayed and up to date Log available.
☐ Equipment properly identified

■ Quantity of groundwater treated annually Totalizer readings
☐ Quantity of surface water treated annually None
Remarks Groundwater logs and separate monthly sampling log.

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ■ Good condition ☐ Needs Maintenance
Remarks

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ■ Good condition ☐ Proper secondary containment ■ Needs Maintenance
Remarks GES noted that there is a leaking fitting at the top of one GAC unit which will be repaired.

4. **Discharge Structure and Appurtenances**
☐ N/A ■ Good condition ☐ Needs Maintenance
Remarks Discharge is to wetland at edge of Snyder Creek above water surface

5. **Treatment Building(s)**
☐ N/A ■ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks

6. **Monitoring Wells** (pump and treatment remedy)
■ Properly secured/locked ■ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ■ Needs Maintenance ☐ N/A
Remarks The concrete pads and valve box covers for wells G16S and G16D have been dislodged from the pavement and may provide a conduit for surface water runoff to enter the wells. Water was present in extraction well vaults but no sheens were noted.

D. Monitoring Data

Monitoring Data
■ Is routinely submitted on time ■ Is of acceptable quality

Monitoring data suggests: * According to Remedium Group, Inc.
☐ Groundwater plume is effectively contained* ■ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ■ N/A
Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction. None

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy is groundwater containment for the shallow aquifer with the UniFirst extraction well supplying deep aquifer containment (the systems are designed to work in concert). Based on the site inspection and interview with Maryellen Johns (Remedium Group) and Van Sawyer (GES), the groundwater treatment system and extraction well pumps are operational. No observations were made during the inspection that call into question the effectiveness or function of the remedy. Repairs are needed to a couple of monitoring well pads and a leaking valve on a GAC unit within the treatment plant.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

O&M staff visit the site on a weekly basis and perform monthly recovery well water levels to check that they are operating properly. Based on observations during the site inspection, there were no concerns that call into question the protectiveness of the remedy. See also comments above in "A".

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

No unexpected changes in cost or scope of O&M or frequent repairs were reported by Maryellen Johns.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None based on the site inspection alone.

Table 1. W. R. Grace Inspection Team Rooster

5-Year Inspection Team Members	**Company**
N. Scott Buchanan	TRC
Cindy Castleberry	Metcalf & Eddy, Inc.
Interviewed PRP Staff	
Maryellen C. Johns	Remedium Group, Inc. / a Subsidiary of W. R. Grace & Co.
Van Sawyer	Groundwater & Environmental Services, Inc. (GES)

08- i.dwg

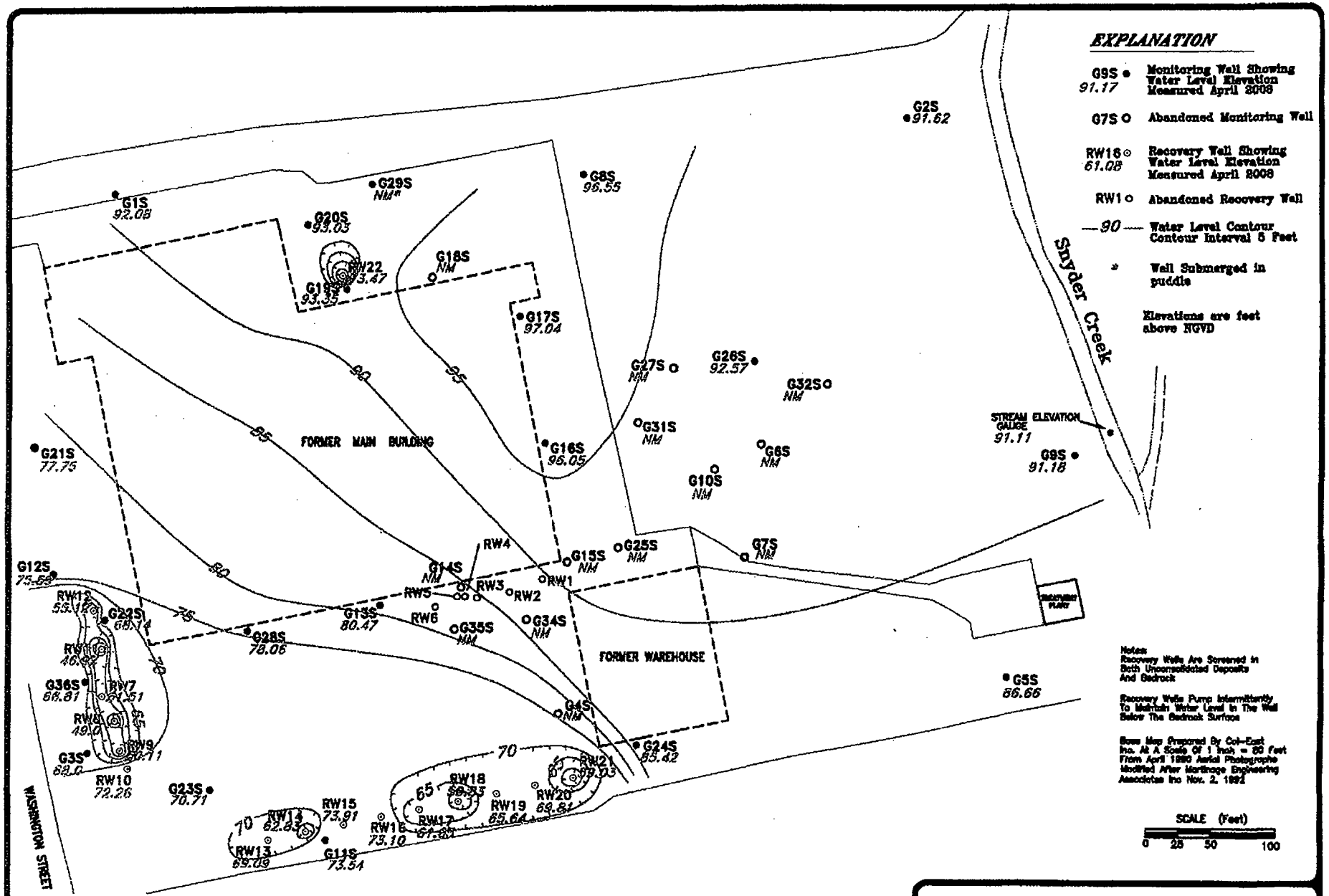


Figure 2-1 Water Table Map, April 14, 2008

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: New England Plastics (NEP)	**Date of inspection:** June 17, 2009
Location and Region: Woburn USEPA Region 1	**EPA ID:** Wells G&H MAD980732168
Agency, office, or company leading the five-year review: TRC / Metcalf & Eddy, Inc.	**Weather/temperature:** Clear, warm

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ■ Other Groundwater monitoring only. Air sparging/soil vapor extraction (AS/SVE) system shut off in March 2000.

Attachments: ■ Inspection team roster attached Table 1 ■ Site map attached Figure 1

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Jeffrey A. Hamel, LSP — Vice President, Woodard & Curran, Inc. — 6/17/09
   Name — Title — Date
   Interviewed ■ at site ☐ at office ☐ by phone Phone no. 978-557-8150
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** See Note 1 _____ _____
   Name — Title — Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no.
   Problems, suggestions; ☐ Report attached Note 1: AS/SVE system shut off in March 2000

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

   Agency _____
   Contact _____ _____ _____ _____
   Name — Title — Date — Phone no.
   Problems; suggestions; ☐ Report attached _____

   Agency _____
   Contact _____ _____ _____ _____
   Name — Title — Date — Phone no.
   Problems; suggestions; ☐ Report attached _____

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

■ O&M manual	■ Readily available	☐ Up to date	☐ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☐ N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☐ N/A

Remarks Sept 1997 monitoring plan and groundwater sampling checklist are kept on-site.

2. **Site-Specific Health and Safety Plan** ■ Readily available ■ Up to date ☐ N/A
   ☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A
   Remarks Sept. 1998 plan is on-site, but an annual addendum is also prepared (not kept on-site).

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☐ N/A
   Remarks Not available on-site, but all I&M staff are OSHA 40-hr trained

4. **Permits and Service Agreements**

☐ Air discharge permit	None	☐ Readily available	☐ Up to date	■ N/A
☐ Effluent discharge	None	☐ Readily available	☐ Up to date	■ N/A
☐ Waste disposal, POTW	None	☐ Readily available	☐ Up to date	■ N/A
☐ Other permits	None	☐ Readily available	☐ Up to date	■ N/A

   Remarks _____

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ■ N/A
   Remarks _____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ■ N/A
   Remarks _____

7. **Groundwater Monitoring Records** ☐ Readily available ☐ Up to date ☐ N/A
   Remarks Maintained off-site.

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ■ N/A
   Remarks _____

9. **Discharge Compliance Records**

☐ Air ☐ Readily available ☐ Up to date ■ N/A
☐ Water (effluent) ☐ Readily available ☐ Up to date ■ N/A
Remarks_____

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☐ N/A
Remarks No visitors other than for annual sampling. O&M staff do sign in at NEP's office.

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ■ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other Woodward & Curran is a direct contractor to NEP.

2. **O&M Cost Records**
☐ Readily available No ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate _____ ☐ Breakdown attached

Approx. $12,000 per year over the past 5 years

Total annual cost by year for review period if available

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: None

V. ACCESS AND INSTITUTIONAL CONTROLS ☐ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☐ N/A
Remarks Vehicle access to back of property is gated. No fencing present.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks Gates are locked at night when NEP workers are not present. No signs or security systems are used.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No ■ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ■ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) _____
Frequency _____
Responsible party/agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No ■ N/A
Reports are verified by the lead agency ☐ Yes ☐ No ■ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ■ N/A
Violations have been reported ☐ Yes ☐ No ■ N/A
Other problems or suggestions: ☐ Report attached

_____
_____
_____
_____

2. **Adequacy** ☐ ICs are adequate* ☐ ICs are inadequate ■ N/A
Remarks None

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ■ No vandalism evident
Remarks None

2. **Land use changes on site** ☐ N/A
Remarks None

3. **Land use changes off site** ☐ N/A
Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ■ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ■ Roads adequate ☐ N/A
Remarks

B. Other Site Conditions

Remarks _____
_____
_____
_____
_____

VII. LANDFILL COVERS ☐ Applicable ■ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks_____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
   ☐ Wet areas ☐ Location shown on site map Areal extent_____
   ☐ Ponding ☐ Location shown on site map Areal extent_____
   ☐ Seeps ☐ Location shown on site map Areal extent_____
   ☐ Soft subgrade ☐ Location shown on site map Areal extent_____
   Remarks_____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
   Areal extent_____
   Remarks_____

B. Benches ☐ Applicable ■ N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined

channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks_____

C. Letdown Channels ☐ Applicable ■ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
Areal extent_____ Depth_____
Remarks_____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
Material type_____ Areal extent_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Areal extent_____ Depth_____
Remarks_____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☐ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations ☐ Applicable ■ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance

☐ N/A
Remarks_____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks_____

E. Gas Collection and Treatment ☐ Applicable ■ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks_____

F. Cover Drainage Layer ☐ Applicable ■ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks_____

G. Detention/Sedimentation Ponds ☐ Applicable ■ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
☐ Siltation not evident
Remarks_____

2. **Erosion** Areal extent_____ Depth_____
☐ Erosion not evident
Remarks_____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks_____

4. **Dam** ☐ Functioning ☐ N/A
Remarks_____

H. Retaining Walls ☐ Applicable ■ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks_____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ■ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks_____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ■ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent_____ Depth_____
Remarks

2. **Performance Monitoring** Type of monitoring_____
☐ Performance not monitored
Frequency_____ ☐ Evidence of breaching
Head differential_____
Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ■ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ■ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ■ N/A
Remarks Everything from old system is currently mothballed.

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ■ N/A

1. **Collection Structures, Pumps, and Electrical**
☐ Good condition ☐ Needs Maintenance
Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____

C. Treatment System ■ Applicable (but not in use) ☐ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ■ Carbon adsorbers
Filters
☐ Additive (*e.g.*, chelation agent, flocculent)
☐ Others _____
☐ Good condition ☐ Needs Maintenance
☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☐ Quantity of groundwater treated annually
☐ Quantity of surface water treated annually
Remarks Spent carbon from the treatment system, which has been shutdown since 2000, was profiled last week and arrangements are being made for off-site disposal

2. **Electrical Enclosures and Panels** (properly rated and functional)
■ N/A ☐ Good condition ☐ Needs Maintenance
Remarks

3. **Tanks, Vaults, Storage Vessels**
■ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks

4. **Discharge Structure and Appurtenances**
■ N/A ☐ Good condition ☐ Needs Maintenance
Remarks

5. **Treatment Building(s)**
■ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks Trailer for mothballed system appears in good condition.

6. **Monitoring Wells** (pump and treatment remedy)
■ Properly secured/locked ■ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks

D. Monitoring Data

Monitoring Data
■ Is routinely submitted on time ■ Is of acceptable quality

Monitoring data suggests:
☐ Groundwater plume is effectively contained ■ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ■ N/A
Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy for NEP included air sparging with soil vapor extraction which was effective in meeting ROD cleanup levels in unsaturated soils and significantly reducing groundwater concentration of TCE and PCE. This system has been shutdown sine 2000. Groundwater is currently being monitored annually and generally shows downward trends with some exceedances of the ROD cleanup levels remaining in groundwater. Jeffery Hamel (Woodward & Curran) indicated that he anticipates the ROD cleanup levels will be obtained with 5 years.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

No issues were identified as part of the site inspection that call into question the protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

No unexpected changes in cost or scope of O&M or frequent repairs were reported by Jeffrey Hamel.

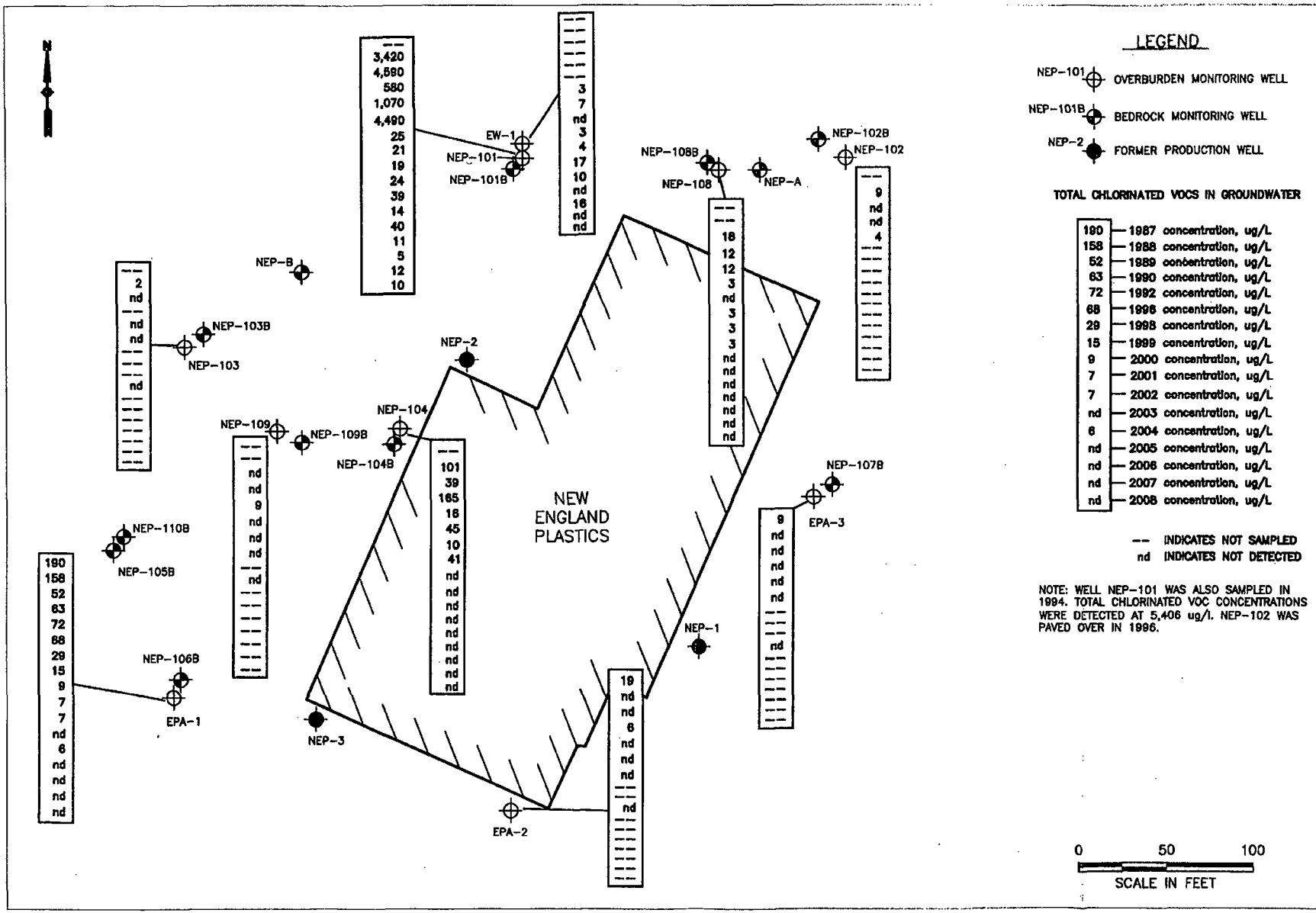
D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None identified based on the site inspection alone.

Table 1. NEP Inspection Team Rooster

5-Year Inspection Team Members	**Company**
N. Scott Buchanan	TRC
Cindy Castleberry	M&E
Interviewed PRP Staff	
Jeffrey Hamel, LSP, Vice President	Woodard & Curran, Inc.


N
NEW ENGLAND PLASTICS
EW-1
NEP-101
NEP-101B
NEP-102B
NEP-102
NEP-108B
NEP-108
NEP-A
NEP-B
NEP-103B
NEP-103
NEP-2
NEP-104
NEP-104B
NEP-109
NEP-109B
NEP-107B
EPA-3
NEP-110B
NEP-105B
NEP-106B
EPA-1
NEP-1
NEP-3
EPA-2
LEGEND
NEP-101 OVERBURDEN MONITORING WELL
NEP-101B BEDROCK MONITORING WELL
NEP-2 FORMER PRODUCTION WELL
TOTAL CHLORINATED VOCS IN GROUNDWATER
190 — 1987 concentration, ug/L
158 — 1988 concentration, ug/L
52 — 1989 concentration, ug/L
63 — 1990 concentration, ug/L
72 — 1992 concentration, ug/L
68 — 1996 concentration, ug/L
29 — 1998 concentration, ug/L
15 — 1999 concentration, ug/L
9 — 2000 concentration, ug/L
7 — 2001 concentration, ug/L
7 — 2002 concentration, ug/L
nd — 2003 concentration, ug/L
6 — 2004 concentration, ug/L
nd — 2005 concentration, ug/L
nd — 2006 concentration, ug/L
nd — 2007 concentration, ug/L
nd — 2008 concentration, ug/L
-- INDICATES NOT SAMPLED
nd INDICATES NOT DETECTED
NOTE: WELL NEP-101 WAS ALSO SAMPLED IN 1994. TOTAL CHLORINATED VOC CONCENTRATIONS WERE DETECTED AT 5,406 ug/l. NEP-102 WAS PAVED OVER IN 1996.
0 50 100
SCALE IN FEET
35 NEW ENGLAND BUSINESS CENTER
ANDOVER, MASSACHUSETTS
978.702.6371 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS
WOODARD & CURRAN
HISTORICAL CHLORINATED VOC CONCENTRATIONS - OVERBURDEN
DESIGNED BY:
DRAWN BY: EVR
CHECKED BY:
NEW ENGLAND PLASTICS CORPORATION
WOBURN, MASSACHUSETTS
ANNUAL GROUNDWATER MONITORING REPORT
JOB NO: 06032
DATE: SEPT. 2008
SCALE: AS NOTED
DRAWING 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 Congress Street, Suite 1100
BOSTON, MA 02114-2023

Memorandum

Date: June 17, 2009

Subject: FYR inspection at Wildwood Source Area Property (Wells G&H Site)

From: Joseph F. LeMay, RPM JFL
Office of Site Remediation and Restoration

To: File

On June 12, 2009, I conducted a site inspection at the Wildwood Source Area Property within Operable Unit 1, Wells G&H Superfund Site. I arrived on the property at approximately 1:20 pm. The weather was mild and overcast with temperatures in the low 70s. I met the following AECOM personnel (representing the PRPs) on the property, who provided a tour of the facility: Pete Cox and Brendan Maye. In addition, Shamus Keohane, EPA Summer Intern, participated in the inspection and took photographs.

Vapor Stream (from Air Sparging- AS/SVE system): The AS/SVE currently operates in three cycles during a 24 hour period. The first cycle operates only the southern-half of the AS/SVE system (8 hours/day); second cycle operates only the northern-half of the AS/SVE system (8 hours/day); and during the third cycle, the AS/SVE is shut down/ not operating (8 hours/day). During operations, the vapor stream enters the treatment facility where moisture is removed at the air water separator and the liquid directed to the influent equalization tank. Additional vapor from the tray air stripper is added to the vapor stream. The vapor stream continues to two 1,500# vapor GAC treatment vessels (in series) and then released to the atmosphere. It was noted during the inspection that the vapor GAC vessels are changed approximately once per year.

Water Stream (from extraction system): Groundwater is extracted from various recovery wells and combined within the treatment system at an equalization tank. The water stream continues to a tray air stripper, where stripped voc are directed to the vapor stream treatment. It was noted during the inspection that the tray air stripper has been very reliable with minimal maintenance. The water stream continues through a sand filter and 2 800# GAC vessels. It was noted during the inspection that the GAC vessels have been changed only 1 in the last 6 years. Treated water is discharged to a MWRA sewer line situated within Salem Street.

It was noted that the most common problem associated with treatment system shut down is electrical surges. Several years ago the electric company installed a new transformer along Salem Street, which improved the surge conditions and reduced the number of shut downs. However, surges continue occurring approximately once a month and causing the treatment system to temporarily shut down. The operator of the facility lives near by and usually gets the facility restarted within 2-3 hours.

Outside the treatment building, observed the former riley pumping well and then walked along the AS/SVE lines. The layout of the lines was consistent with the annual reports. It was noted that SVE line enters the middle of the layout and is divided to capture vapors from the southern portion of the system (VE1 –VE5) and northern portion of the system (BE6 – VE11). The system is designed this way to minimize pressure losses near the end of the VE lines. Within the treatment building, there is one manometer which monitors the vacuum within the VE line. It was also noted that periodically, individual lines are monitored with a handheld device to evaluate negative pressure. It was suggested that these lines have always shown negative pressure.

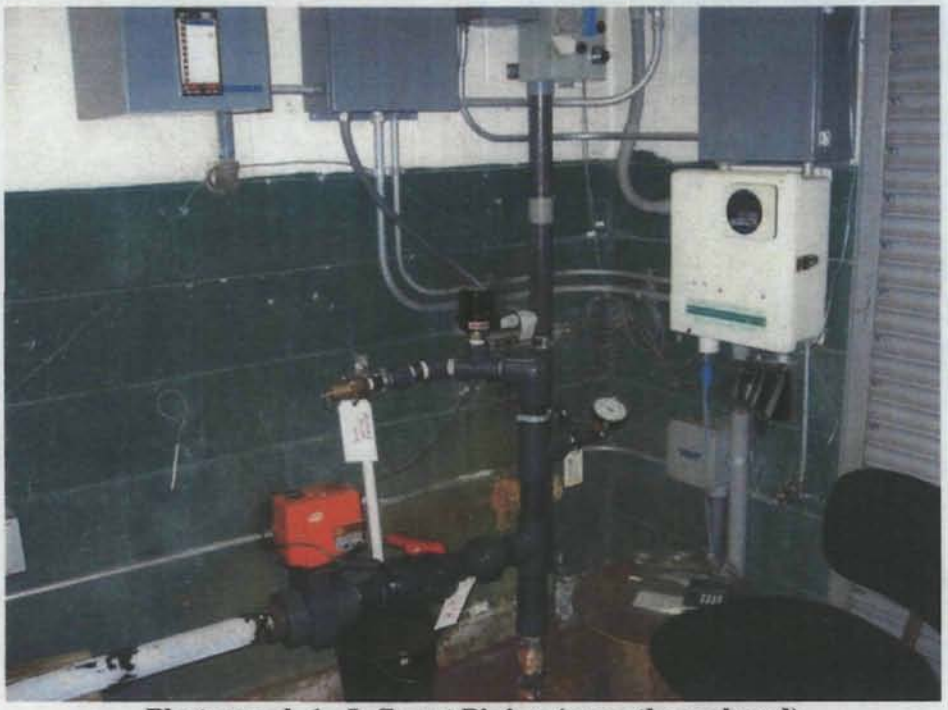
During our outside inspection, we observed the locations of monitoring wells BSW6 and BSW1, which have illustrated VOC increases since start up. We also observed some wildlife on the property, such as snapping turtles, painted turtles, and hares.

cc: Bob Cianciarulo, EPA
Jennifer McWeeney, MassDEP
David Sullivan, TRC Solutions

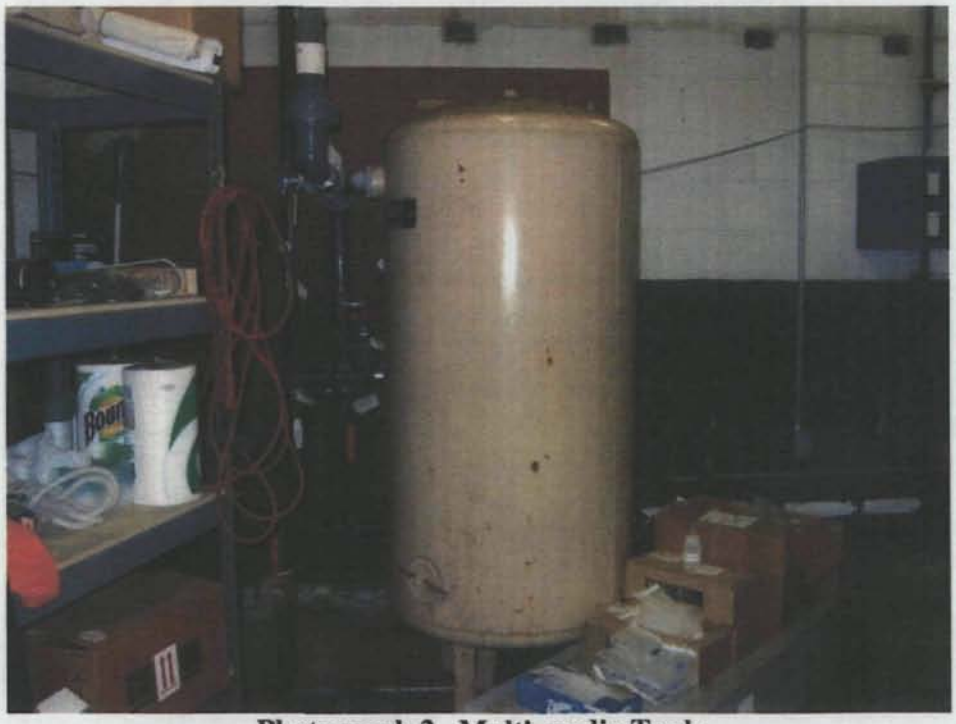
ATTACHMENT 5

SITE INSPECTION PHOTOGRAPHS

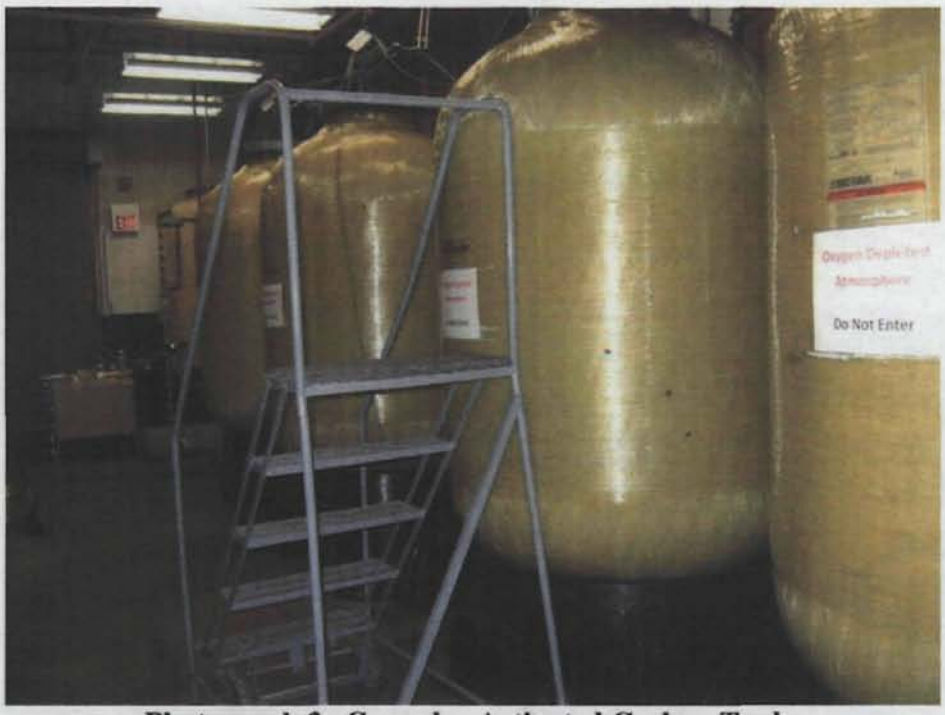
UNIFIRST PHOTOGRAPHS



Photograph 1. Influent Piping (recently replaced)

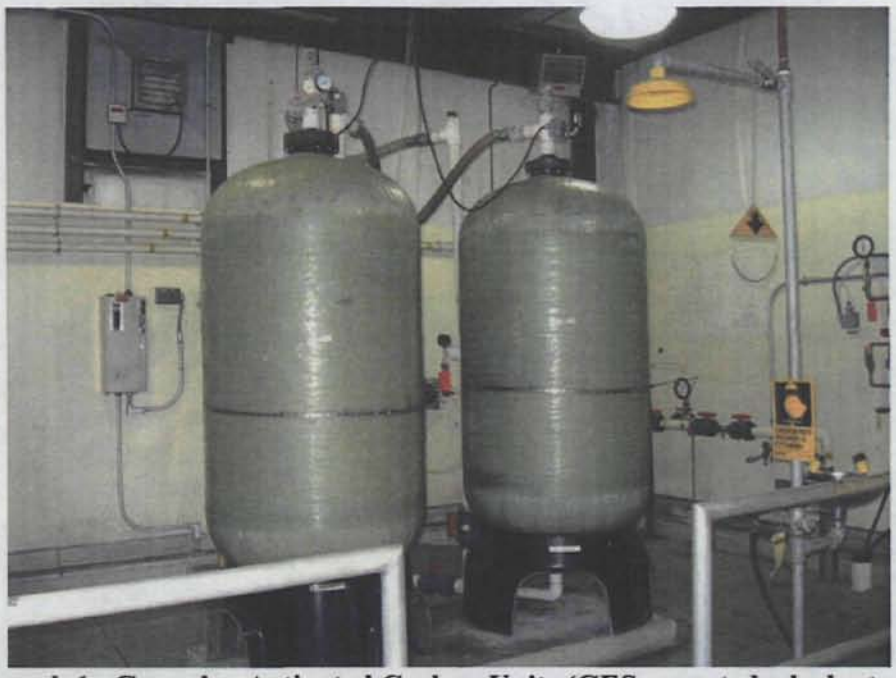


Photograph 2. Multi-media Tank



Photograph 3. Granular Activated Carbon Tanks

GRACE PROPERTY PHOTOGRAPHS



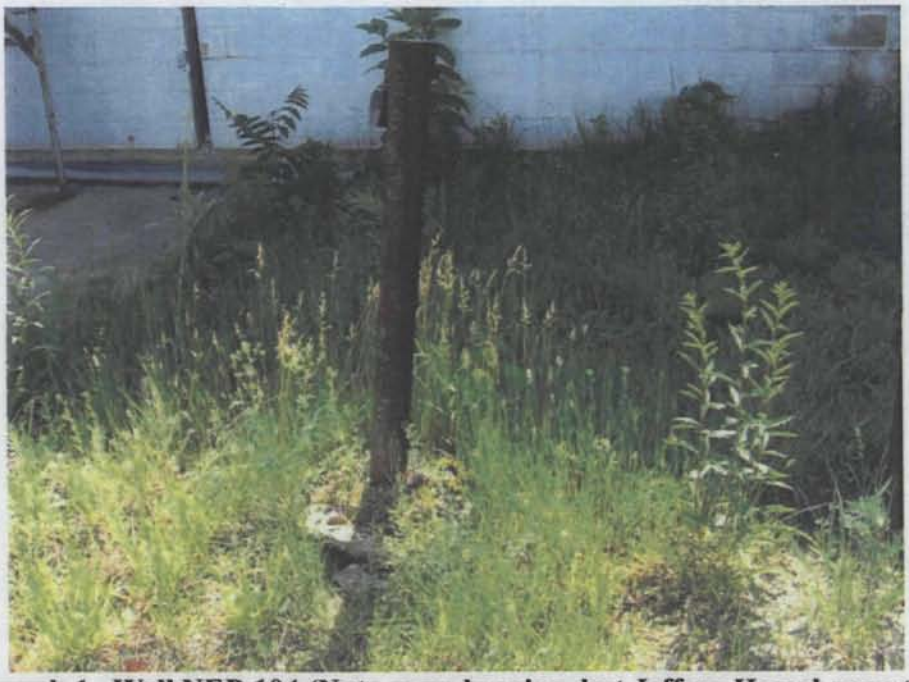
Photograph 1. Granular Activated Carbon Units (GES reported a leak at valve at top of unit on the right)

Photograph 2. Equalization Tank

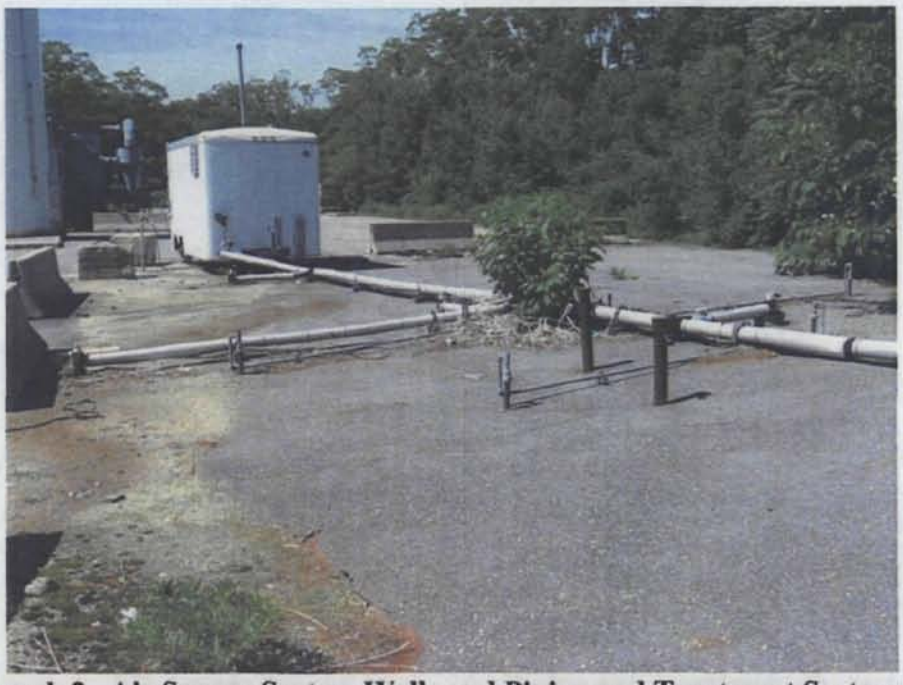
Photograph 3. Monitoring Wells G16S and G16D (Note that the concrete pads and valve boxes are dislodged from the pavement)

Photograph 4. Area of Former Manufacturing Building

NEW ENGLAND PLASTICS (NEP) PHOTOGRAPHS



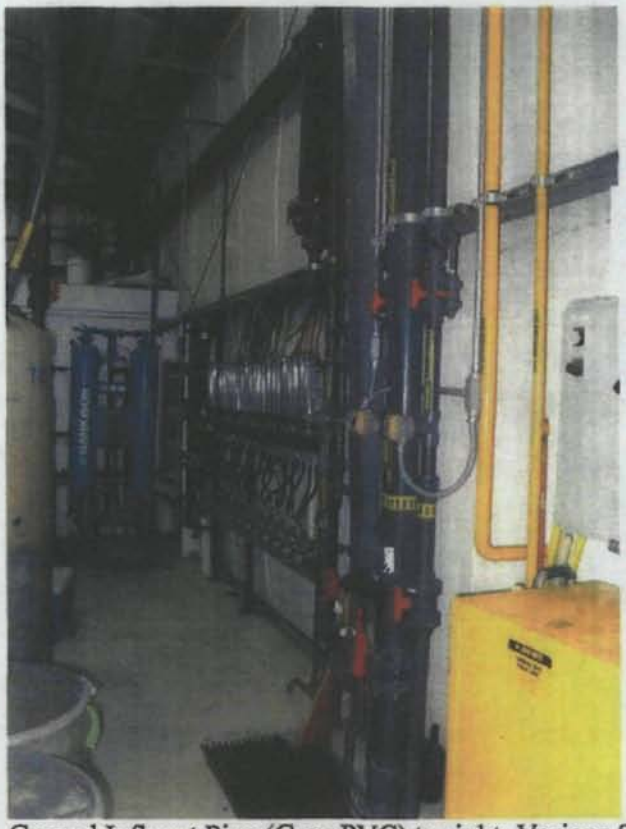
Photograph 1. Well NEP-104 (Note some heaving, but Jeffery Hamel reported that the bentonite seal was still intact)



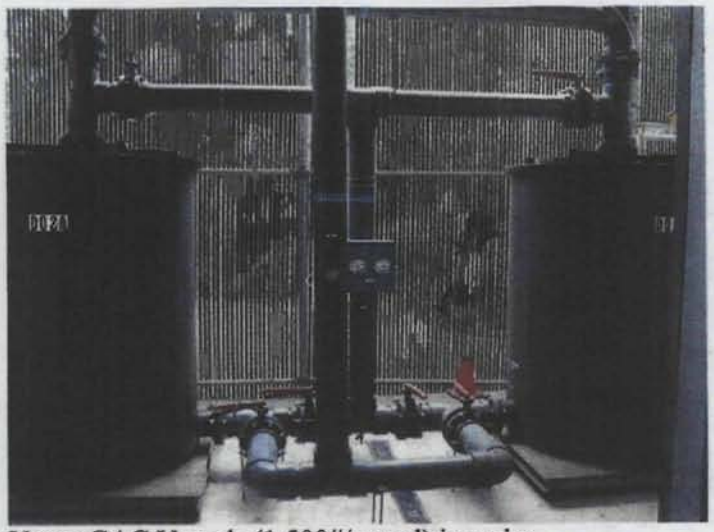
Photograph 2. Air Sparge System Wells and Piping and Treatment System Trailer

WILDWOOD FIVE YEAR REVIEW INSEPCTION PHOTOGRAPHS (6/12/09)

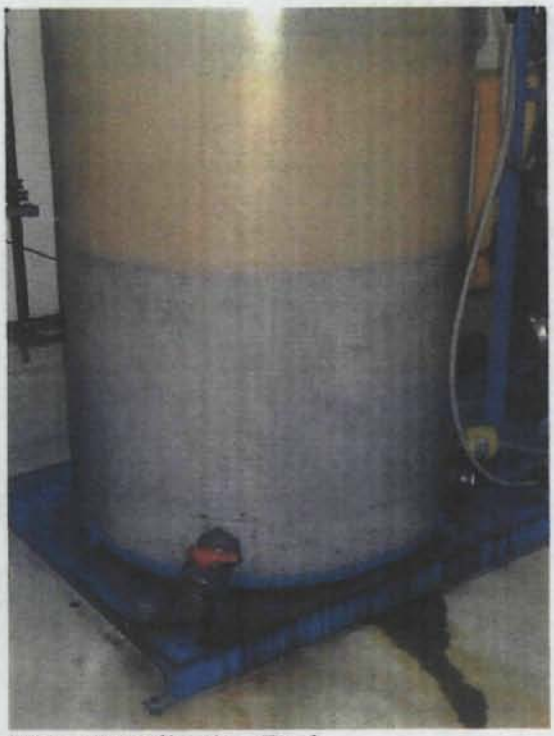
Treatment Facility Building.



Ground Influent Pipe (Gray PVC) to right; Various SVE Influent Piping to left.



Vapor GAC Vessels (1,500#/vessel) in series.



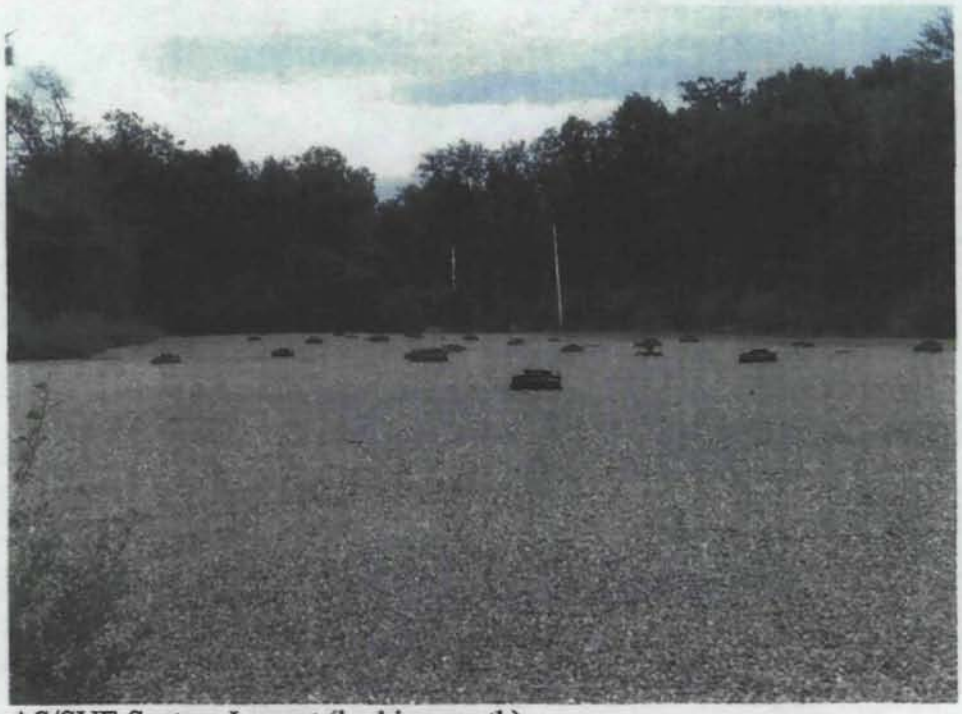
Water Equalization Tank.

Tray Air Stripper.

Water GAC Vessels (800#/vessel) in series.

Riley Well Enclosure.

AS/SVE System Layout (looking north).



AS/SVE System Layout (looking south).

Center of AS/SVE System where SVE is divided.

Snapping Turtle.

ATTACHMENT 6

INTERVIEW RECORDS

INTERVIEW DOCUMENTATION FORM

The following is a list of individuals interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.

Name	Title/Position	Organization	Date
Timothy Cosgrave	Project Manager	Harvard Project Services - UniFirst Contractor	June, 11, 2009
Van Sawyer	Technical Manager	GES (Grace Contractor)	June 16, 2009
Maryellen C. Johns	Sr. Project Engineer	The Remedium Group (a Grace Subsidiary)	June 16, 2009
Jeffrey Hamel	Vice President	Woodard & Curran, Inc. (NEP Contractor)	June 17, 2009
Jay Corey	Woburn City Engineer	City of Woburn	June 10, 2009
Jennifer McWeeney	Project Manager Wells G&H Site	MassDEP	June, 11, 2009
Thomas McLuaghlin	Mayor	City of Woburn	July, 10, 2009
Jack Fralick	Health Agent	Woburn Board of Health	June 4, 2009
Michael Raymond	Woburn Aldeman	City of Woburn	July 12, 2009
Linda Raymond	Environmental Activist	Aberjona River Study Coalition, Inc.	July 12, 2009
Donna Robbins	Resident	City of Woburn	July 15, 2009
Kathleen Barry	Environmental Activist	Aberjona River Study Coalition, Inc.	July 14, 2009

INTERVIEW RECORD

Site Name: Wells G&H Superfund Site	**EPA ID No.:** MAD980732168	
Subject: Five Year Review	**Time:** 9:00AM	**Date:** 6/11/2009
Type: ☐ Telephone ■ Visit ☐ Other **Location of Visit:** Unifirst Property, Woburn, MA	☐ Incoming ☐ Outgoing N/A	

Contact Made By:

Name:	Title:	Organization:
N. Scott Buchanan	Project Geologist	TRC
Cindy Castleberry	Project Engineer	Metcalf &Eddy, Inc

Individual Contacted:

Name:	Title:	Organization:
Timothy M. Cosgrave	Project Manager	Harvard Project Services (consultant to UniFirst)

Telephone No: 978-772-1105 **Fax No:** **E-Mail Address:** tcosgrave@harvardprojects.com	**Street Address:** 249 Ayer Road, Suite 206 Harvard, MA 01451-1132

1.A. What is your overall impression of the project? (general sentiment)

Mr. Cosgrave stated that the system is operating as required by the ROD. Groundwater is being contained on the site.

2.A. Is the remedy functioning as expected? How well is the remedy performing?

Mr. Cosgrave stated that the remedy is performing fine for a known DNAPL site.

3.A. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

Mr. Cosgrave stated that the he does not remember exactly what the monitoring data shows. This data is summarized in the annual reports (Section 3.0 Contaminant Distribution?).

4.A. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

Mr. Cosgrave stated that there are weekly visits, a dial in data logger to conduct remote checks and the data logger will dial him if there are any problems.

5.A. Have there been any significant changes in the O&M requirements,

maintenance schedules, or sampling routes since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.

Mr. Cosgrave stated that in 2003 the UVOX system was changed over to carbon. There have been no other significant changes to the system since then.

Minor updates to the system include new carbon tanks in 2007(?). The pumping well has been operational since they replaced downhole piping to plastics. System downtimes have been minimal.

6.A. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years? If so, please give details.

Mr. Cosgrave stated that expenses have not been completely unexpected but there were some carbon tank replacements and lightning fried a groundwater pump and some electrical wiring in 2008.

7.A. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

No.

8.A. Do you have any comments, suggestions, or recommendations regarding the project?

Nothing at this time.

SUPPLEMENTAL QUESTIONS

Groundwater Cleanup

1.B. Are certain wells continuing to have high detections while others are dropping? What explains these results?

Mr. Cosgrave stated that this information is covered in the Annual Report Section 3.0 and Figure A4.

2.B. Has the mix of contaminants changed in the monitoring or treatment system? What accounts for these changes?

No, contaminants of concern at the site are PCE, TCE and 111-TCA

3.B. Is there an indication that DNAPL or LNAPL is present? How have you checked or verified?

Mr. Cosgrave stated that DNAPL was observed at UC8 in 1987-88 when the well was drilled. DNAPL is currently not monitored for. Monitor well UC7 has concentrations indicative of NAPL.

4.B. Discuss how the treatment processes changed or have been adjusted over

time.

Mr. Cosgrave stated that there have been no significant changes

5.B. How have pumping rates changed over time and why have they changed?

Mr. Cosgrave stated that there have been subtle changes but the goal of the pumping is to keep containment at the site's property boundary.

6.B. What are your most recent projections for achieving cleanup overall or in subportions of the site?

Mr. Cosgrave stated that there are no recent projections.

7.B. What changes do you anticipate will be made in the operation of the system as subportions of the site are cleaned-up?

None

8.B. Do you expect cleanup to be achieved below regulatory prescribed levels or do you envision that a constant/asymptotic level of contamination will remain above numerical cleanup criteria?

Mr. Cosgrave stated that the site is a known DNAPL site and that preventing contaminant migration offsite is the current goal.

9.B. Are you considering pulsing the pumping operation in a different manner than in the past? Has pulsing helped?

Mr. Cosgrave stated that pulsing has not been considered as it is not consistent with the ROD goal of containment.

Potential Local Contaminant/Hydraulic Impacts/Effects

10.B. What upgradient sites are believed to be impacting site cleanup and to what degree? Are there any suggested steps that could be taken to deal with impacts?

Mr. Cosgrave stated that UC22 intentionally contains deep groundwater from W.R. Grace site.

11.B. Are you noticing the impact of offsite entities on the aquifer in terms of offsite pumping or other hydraulic impacts that may be impacting the local water table?

Mr. Cosgrave stated that data loggers show no impact from offsite pumping.

12.B. How has the natural gradient changed and are seasonal gradients present that vary from the average yearly gradient? Does the system function best at low water table or high water table or somewhere in between?

Mr. Cosgrave stated that there are seasonal changes but the system is tweaked to deal with the seasonal variations.

Nature and Extent

13.B. What is the integrity of the facility sewers? Is it possible that there are continuing sources of release at the site from buried pipelines and tanks?

Mr. Cosgrave stated that he is not aware of anything that could be a continuing source at the site. The initial source was an above ground storage tanks and enough drilling and test pits were conducted early on in the project to look for other sources.

14.B. Is there any known surficial soil contamination remaining at the property?

Mr. Cosgrave stated that the 1994 Unconsolidated Soil Report would address this question.

Reporting

15.B. What site investigation and remediation reports have been generated in the past 5 years?

Monthly Status Report and Annual Operations and Maintenance Reports.

16.B. Provide a summary of the types of problems or errors that have been made in the prior 5 years.

See previous answers for slight operation issues. The system runs fine for a majority of the time.

17.B. Have you conducted a regulatory compliance audit (internal or external) and is a report available describing any deficiencies identified?

Mr. Cosgrave stated that no audit has been conducted.

18.B. Have there been any health and safety issues on-site?

No.

Land Use

19.B. Has site ownership changed?

No.

20.B. Has site occupancy changed? Are there any occupancy changes in the foreseeable future? If so, please describe.

No.

21.B. What is the zoning of the property? Are there any institutional controls/deed restrictions in place?

Mr. Cosgrave stated that he does not know the zoning and there are no institutional controls or deed restrictions in place.

22.B. Are there new industrial processes occurring at the site or has there been a

change in chemicals used at the site?

No.

23.B. What are the current uses of the property (indoor and outdoor [landscaping])?

Office space, storage building and parking lot

24.B. How frequently are authorized individuals present at the property (days/week)?

Mr. Cosgrave stated that the site is regularly staffed seven days a week from 8:00-5:30. Possibly shorter hours on Sunday.

25.B. What are the planned future uses of the property (if different from current uses)?

None

26.B. Is groundwater currently used (e.g., as process water) on the property?

No.

27.B. Are there plans to use groundwater on-site in the future?

No.

Exposure Information

28.B. What measures have been taken to secure the site and the contaminated areas (e.g., fencing, locks, etc.)? How successful have these measures been?

Mr. Cosgrave stated that the property is completely fenced and locked outside of regular business hours.

29.B. Is there evidence or sightings of trespassers on the property? If yes, how often and what type of activities do they engage in?

No.

30.B. Have there been any events of vandalism at the property?

No.

31.B. Have there been any unusual or unexpected activities or events at the site (e.g., flooding)?

No.

32.B. Has the site been the subject of any community complaints (e.g., odor, noise, health, etc.)?

No.

Wrap-Up

33.B. Do you have any recommendations for reducing or increasing activities at the site?

No.

34.B. Is there any other information that you wish to share that might be of use?

No.

INTERVIEW RECORD

Site Name: Wells G&H Superfund Site	**EPA ID No.:** MAD980732168	
Subject: Five Year Review	**Time:** 9:00 AM	**Date:** 6/16/2009
Type: ☐ Telephone ■ Visit ☐ Other **Location of Visit:** W.R. Grace Property, Woburn, MA	☐ Incoming ☐ Outgoing N/A	

Contact Made By:

Name:	Title:	Organization:
-N. Scott Buchanan -Cindy Castleberry	-Project Manager -Project Engineer	-TRC -Metcalf & Eddy

Individuals Contacted:

Name:	Title:	Organization:
-Maryellen C. Johns -Van Sawyer	-Senior Project Engineer -Technical Manager	-Remedium Group (A Subsidiary of Grace) -GES
Telephone No.: 617-498-2668 **Fax No.:** **E-mail Address:** maryellen.johns@grace.com	**Street Address** 62 Whittemre Avenue Cambridge, MA 02140	

1.A. What is your overall impression of the project? (general sentiment)

Mrs. Johns stated that they feel that they are at the tail end of the O&M at the site. The system has been functioning as designed and Grace has submitted paperwork requesting a system shutdown test with the EPA.

2.A. Is the remedy functioning as expected? How well is the remedy performing?

Mrs. Johns stated that the system is functioning and the groundwater quality is improving

3.A. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

Yes

4.A. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

GES conducts weekly system checks and monthly checks of the water levels in the recovery wells.

5.A. Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routes since start-up or in the last five years?

If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.

No

6.A. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years? If so, please give details.

No

7.A. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

No

8.A. Do you have any comments, suggestions, or recommendations regarding the project?

Grace would like to be allowed to conduct shutdown tests on some of the recovery wells.

SUPPLEMENTAL QUESTIONS

Groundwater Cleanup

1.B. Are certain wells continuing to have high detections while others are dropping? What explains these results?

Mrs. Johns stated no, all wells are showing decreasing concentrations with RW-22 concentrations dropping slower than the other wells onsite.

2.B. Has the mix of contaminants changed in the monitoring or treatment system? What accounts for these changes?

No

3.B. Is there an indication that DNAPL or LNAPL is present? How have you checked or verified?

No indication and not checked for.

4.B. Discuss how the treatment processes changed or have been adjusted over time.

Mrs. Johns and Mr. Sawyer stated that it hasn't changed since the UVOX system was shutdown prior to this 5-year review period.

5.B. How have pumping rates changed over time and why have they changed?

Mrs. Johns and Mr. Sawyer stated that the pumping rates haven't changed.

6.B. What are your most recent projections for achieving cleanup overall or in subportions of the site?

Mrs. Johns stated that southwest corner of the site is close to or at MCLs and RW22 area is a bit different.

Grace is currently in discussions with EPA about the proposal to shutdown the wells in the southwest portion of the property and additional remediation at RW22.

7.B. What changes do you anticipate will be made in the operation of the system as subportions of the site are cleaned-up?

Depends on the discussion with EPA per their May 2009 letter about the source area.

8.B. Do you expect cleanup to be achieved below regulatory prescribed levels or do you envision that a constant/asymptotic level of contamination will remain above numerical cleanup criteria?

Mrs. Johns stated that it is likely after the shutdown of the southwestern recovery wells there would be a MNA component to the site remedy.

9.B. Are you considering pulsing the pumping operation in a different manner than in the past? Has pulsing helped?

Mrs. Johns stated that RW22 was on an on/off monthly cycle originally but for more than the past five years the pump has remained constantly on because of better recovery.

Potential Local Contaminant/Hydraulic Impacts/Effects

10.B. What upgradient sites are believed to be impacting site cleanup and to what degree? Are there any suggested steps that could be taken to deal with impacts?

None

11.B. Are you noticing the impact of offsite entities on the aquifer in terms of offsite pumping or other hydraulic impacts that may be impacting the local water table?

Mrs. Johns stated only the Unifirst well, OC22, as designed.

12.B. How has the natural gradient changed and are seasonal gradients present that vary from the average yearly gradient? Does the system function best at low water table or high water table or somewhere in between?

Mr. Sawyer stated that the seasonal changes don't affect the system. The pumps pump when the water level is above the pumping level.

Nature and Extent

13.B. What is the integrity of the facility sewers? Is it possible that there are *continuing sources of release at the site from buried pipelines and tanks?*

Mrs. Johns stated that there are no continuing sources remaining onsite. All piping associated with the buildings was removed in 2006 when the buildings were demolished. None of this piping was considered to be a continuing source.

14.B. Is there any known surficial soil contamination remaining at the property?

Mrs. Johns stated that there were three PCB soils samples that exceeded the ROD levels in the footprint of the old buildings from approximately 2.8'bgs.

Reporting

15.B. What site investigation and remediation reports have been generated in the past 5 years?

-Annual Reports
-Monthly O&M Reports
-Sub-Slab Investigation Report (late 2006 or early 2007)
-RW22 Area Report (May 2007)

16.B. Provide a summary of the types of problems or errors that have been made in the prior 5 years.

None

17.B. Have you conducted a regulatory compliance audit (internal or external) and is a report available describing any deficiencies identified?

No

18.B. Have there been any health and safety issues on-site?

None

Land Use

19.B. Has site ownership changed?

No

20.B. Has site occupancy changed? Are there any occupancy changes in the foreseeable future? If so, please describe.

Mrs. Johns stated that the former manufacturing and warehouse buildings were demolished. The property is currently on the market with no current offers, so the future plans for the site are unknown at this point.

21.B. What is the zoning of the property? Are there any institutional controls/deed restrictions in place?

Mrs. Johns stated that she is not sure of the zoning and there are not any current deed restrictions but if there is a property transaction they are anticipated.

22.B. Are there new industrial processes occurring at the site or has there been a change in chemicals used at the site?

No

23.B. What are the current uses of the property (indoor and outdoor

[landscaping])?

Vacant lot with a treatment system

24.B. How frequently are authorized individuals present at the property (days/week)?

GES conducts a weekly system check.

25.B. What are the planned future uses of the property (if different from current uses)?

Mrs. Johns stated that the property is currently for sale, future uses are unknown.

26.B. Is groundwater currently used (e.g., as process water) on the property?

No

27.B. Are there plans to use groundwater on-site in the future?

No

Exposure Information

28.B. What measures have been taken to secure the site and the contaminated areas (e.g., fencing, locks, etc.)? How successful have these measures been?

Site is fenced on three sides, open along wetlands. Gates remain locked. Wells are locked.

29.B. Is there evidence or sightings of trespassers on the property? If yes, how often and what type of activities do they engage in?

Mrs. Johns stated that Cummings uses land in back (across Snyder Creek) and litigation is currently ongoing. There is no evidence of other trespassing.

30.B. Have there been any events of vandalism at the property?

No.

31.B. Have there been any unusual or unexpected activities or events at the site (e.g., flooding)?

No.

32.B. Has the site been the subject of any community complaints (e.g., odor, noise, health, etc.)?

No.

Wrap-Up

33.B. Do you have any recommendations for reducing or increasing activities at the

site?

Grace would like to conduct the shutdown test.

34.B. Is there any other information that you wish to share that might be of use?

No.

INTERVIEW RECORD

Site Name: Wells G&H Superfund Site	**EPA ID No.:** MAD980732168	
Subject: Five Year Review	**Time:** 10:00 AM	**Date:** 6/17/2009
Type: ☐ Telephone ■ Visit ☐ Other **Location of Visit:** New England Plastics Site , Woburn, MA	☐ Incoming ☐ Outgoing N/A	

Contact Made By:

Name:	Title:	Organization:
N. Scott Buchanan	Project Manager	TRC
Cindy Castleberry	Project Engineer	Metcalf & Eddy

Individuals Contacted:

Name:	Title:	Organization:
Jeffrey A. Hamel	Vice President	Woodward & Curran (consultant to New England Plastics)
Telephone No.: 978-557-8150 **Fax No.:** 978-557-7948 **E-Mail Address:** jhamel@woodwardcurran.com	**Street Address:** 35 New England Business Center, Suite 180 Andover, MA 01810	
Name: Mike Famiglietti	**Title:** Treasurer	**Organization:** New England Plastics
Telephone No.: 781-933-6004 **Fax No.:** **E-Mail Address:**	**Street Address:** 310 Salem St # 2 Woburn, MA 01801	

Preface:

The system at this Site has been shut down since 2000. There are no O&M activities related to the operation of the system.

1.A. What is your overall impression of the project? (general sentiment)

Mr. Hamel stated that the system was effective, groundwater is showing decreasing trends. Additional questions about the Wells G&H Site as a whole have been brought forth by the EPA that need to be evaluated.

2.A. Is the remedy functioning as expected? How well is the remedy performing?

Mr. Hamel stated that the system was effective. Chlorinated compounds dropped by order of magnitudes to concentrations around the ROD levels.

3.A. What does the monitoring data show? Are there any trends that show

contaminant levels are decreasing?

Mr. Hamel stated that yes there is a decrease in the concentrations.

4.A. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

Mr. Hamel stated that there is an annual groundwater monitoring event.

The system is not running and does not require O&M.

5.A. Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routes since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.

System is off.

6.A. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years? If so, please give details.

No.

7.A. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

Mr. Hamel stated that they were thinking of looking at decreasing the number of wells to be sampled or the frequency of sampling due to the observed concentration trends at the site, but the new concerns from EPA need to be considered.

8.A. Do you have any comments, suggestions, or recommendations regarding the project?

No.

SUPPLEMENTAL QUESTIONS
Groundwater Cleanup

1.B. Are certain wells continuing to have high detections while others are dropping? What explains these results?

Mr. Hamel stated that there are not wells with high concentrations. There are some more persistent concentrations in the source area and bedrock but these concentrations are approaching ROD levels.

2.B. Has the mix of contaminants changed in the monitoring or treatment system? What accounts for these changes?

Mr. Hamel stated no, PCE and TCE are the contaminants of concern at the site.

3.B. Is there an indication that DNAPL or LNAPL is present? How have you

checked or verified?

Mr. Hamel stated that there is no indication and the wells are checked with oil-water interface probes during the annual sampling event.

4.B. Discuss how the treatment processes changed or have been adjusted over time.

The system is off.

5.B. How have pumping rates changed over time and why have they changed?

The system is off.

6.B. What are your most recent projections for achieving cleanup overall or in subportions of the site?

Mr. Hamel stated that in five years he thinks the site will be completely below ROD levels. There are currently two wells showing concentrations just above ROD levels.

7.B. What changes do you anticipate will be made in the operation of the system as subportions of the site are cleaned-up?

The system is off.

8.B. Do you expect cleanup to be achieved below regulatory prescribed levels or do you envision that a constant/asymptotic level of contamination will remain above numerical cleanup criteria?

Mr. Hamel stated that it looks like the site will be cleaned up with time (five years or so).

9.B. Are you considering pulsing the pumping operation in a different manner than in the past? Has pulsing helped?

The system is off.

Potential Local Contaminant/Hydraulic Impacts/Effects

10.B. What upgradient sites are believed to be impacting site cleanup and to what degree? Are there any suggested steps that could be taken to deal with impacts?

Mr. Hamel stated that the shallow aquifer does not show any impacts from upgradient sites, but the deep aquifer could be impacted. The deep bedrock wells are not sampled.

11.B. Are you noticing the impact of offsite entities on the aquifer in terms of offsite pumping or other hydraulic impacts that may be impacting the local water table?

No

12.B. How has the natural gradient changed and are seasonal gradients present that vary from the average yearly gradient? Does the system function best at low water table or high water table or somewhere in between?

The system is off.

Nature and Extent

13.B. What is the integrity of the facility sewers? Is it possible that there are continuing sources of release at the site from buried pipelines and tanks?

Mr. Hamel stated that they are not aware of any continuing sources and the groundwater concentrations do not indicate any.

14.B. Is there any known surficial soil contamination remaining at the property?

No

Reporting

15.B. What site investigation and remediation reports have been generated in the past 5 years?

-Annual Groundwater Monitoring Reports
-Monthly O&M Status Reports

16.B. Provide a summary of the types of problems or errors that have been made in the prior 5 years.

None

17.B. Have you conducted a regulatory compliance audit (internal or external) and is a report available describing any deficiencies identified?

Mr. Hamel stated that not for Woodward & Curran.

18.B. Have there been any health and safety issues on-site?

Mr. Hamel stated that not for Woodward & Curran.

Land Use

19.B. Has site ownership changed?

No

20.B. Has site occupancy changed? Are there any occupancy changes in the foreseeable future? If so, please describe.

No.

21.B. What is the zoning of the property? Are there any institutional controls/deed restrictions in place?

Mr. Famiglietti stated that the property is zoned as office.

Mr. Hamel stated that he is not aware of any deed restrictions.

22.B. Are there new industrial processes occurring at the site or has there been a change in chemicals used at the site?

No

23.B. What are the current uses of the property (indoor and outdoor [landscaping])?

Office space and mold extrusion work (light manufacturing)

24.B. How frequently are authorized individuals present at the property (days/week)?

Mr. Famiglietti stated that they are currently working a four-day 40-hour work week Monday through Thursday.

25.B. What are the planned future uses of the property (if different from current uses)?

No

26.B. Is groundwater currently used (e.g., as process water) on the property?

No

27.B. Are there plans to use groundwater on-site in the future?

No

<u>Exposure Information</u>

28.B. What measures have been taken to secure the site and the contaminated areas (e.g., fencing, locks, etc.)? How successful have these measures been?

There is a road gate and the wells are locked. There has been no evidence of vandalism.

29.B. Is there evidence or sightings of trespassers on the property? If yes, how often and what type of activities do they engage in?

No

30.B. Have there been any events of vandalism at the property?

No

31.B. Have there been any unusual or unexpected activities or events at the site (e.g., flooding)?

No

32.B. Has the site been the subject of any community complaints (e.g., odor, noise, health, etc.)?

No

Wrap-Up

33.B. Do you have any recommendations for reducing or increasing activities at the site?

Mr. Hamel stated not for the current scope.

34.B. Is there any other information that you wish to share that might be of use?

Mr. Hamel stated that the release at the site was surficial, a system was installed, and New England Plastics followed the regulations. Now with the indoor air and deep bedrock issues he is concerned how it will impact NEP.

INTERVIEW RECORD

Site Name: Wells G&H Superfund Site	**EPA ID No.:** MAD980732168	
Subject: Five Year Review	**Time:** 10:00	**Date:** 6/10/2009
Type: ☐ Telephone ■ Visit ☐ Other **Location of Visit:** City Hall	☐ Incoming ☐ Outgoing N/A	

Contact Made By:

Name: N. Scott Buchanan	**Title:** Project Manager	**Organization:** TRC

Individual Contacted:

Name: John "Jay" E. Corey Jr., P.E.	**Title:** City Engineer	**Organization:** City of Woburn
Telephone No.: 781-935-2438 **Fax No.:** 781-897-5882 **E-Mail Address:** jcorey@cityofwoburn.com	**Street Address:** 10 Common Street Woburn, MA 01801	

5-YEAR REVIEW QUESTIONS FOR STATE/LOCAL OFFICIALS

1.A. What is your overall impression of the project? (general sentiment)

Mr. Corey stated the project is moving along nicely. OU2 is more palatable than OU1 was. This is likely because the area is covered is less populated. There has been good public availability of information like Mr. Joe LeMay's presentation before City Council. OU2 feels like the light at the end of the tunnel.

2.A. Have there been routine communication or activities (site visits, inspections) involving your office regarding the site? If so, please give purpose and results.

Mr. Corey has not visited the site often in the recent past. He has given tours to student groups from the New England School of Law and Wesley College. Anyone interested in site development gets refered to Mr. Joe LeMay and the EPA.

Eventually there will be site controls in place for the whole site. OU1 controls are almost complete and all other areas have been planned but not implemented.

3.A. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office. If so, please give details of the events and results of the response.

For the OU2 area – No
For the OU1 area – several private utilities, who the engineering office has referred them to the EPA and Mr. Joe Lemay when they are not in compliance. DPW occasionally forgets

also, and Mr. Corey reminds them to use a sub-contractor who has proper HASPs and training.

Overall it has been few and far between the incidents.

4.A. Do you feel well informed about the site's activities and progress?

Mr. Corey stated that yes, literature is available to me. There are open issues including Halls Brook and Holden Area possible flooding. But Mr. Corey has and is working with Mr. Jack Fralick from the Board of Health.

5.A. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Not at the current time.

As final plans get implemented there will probably be issues but they can be dealt with as they come. OU2 appears much easier than OU1

Public perception of the site has been made difficult by the exposure for the book and movie "A Civil Action"

SUPPLEMENTAL QUESTIONS

1.B. What concerns do you have about the site?

No – Mr. Corey is satisfied with how the EPA is handling the site.

2.B. Are you aware of any community concerns regarding the site? Provide details.

No specific concerns. Mostly just general questions from unaware people.

3.B. Have the activities to date at the site helped the neighborhood and/or community?

Bringing down the W.R. Grace building was helpful to public perception of the site. Mr. Corey thinks that redevelopment of the site will help the perception even more.

4.B. Are you aware of any events of vandalism or trespassing at the site?

No

5.B. Are you aware of any changes in projected land use at or near the site?

Not at present

6.B. We understand that groundwater from that site may be used in the distant future. Are there plans for use of groundwater at the site in the near term?

None, possibilities for far of future uses would include irrigation or industrial.

7.B. Are there any pending changes in laws or regulations that may impact the

site?

None that Mr. Corey is aware of.

8.B. Do you have any suggestions or recommendations regarding the project?

Mr. Corey thinks the project is good at this time.

9.B. Is there any other information that you wish to share that might be of use?

Not at this time, Mr. Corey is fairly satisfied. Mr. Joe LeMay has been easy to get a hold of and a great contact.

INTERVIEW RECORD

Site Name: Wells G&H Superfund Site	**EPA ID No.:** MAD980732168	
Subject: Five Year Review	**Time:** 13:00	**Date:** 06/11/2009
Type: ■ Telephone ☐ Visit ☐ Other **Location of Visit:** Phone call in	☐ Incoming ☐ Outgoing N/A	

Contact Made By:

Name: N. Scott Buchanan	**Title:** Project Manager	**Organization:** TRC

Individual Contacted:

Name: Jennifer McWeeney	**Title:** Project Manager	**Organization:** MADEP
Telephone No.: 617-654-6560 **Fax No.:** **E-mail Address:** jennifer.mcweeney@state.ma.us	**Street Address:** 1 Winter Street Boston, MA 02108	

Preface:

Ms. McWeeney stated that it was too bad that the EPAs comments on the Phase IA Report were rescinded. Also, the pressing issue in her mind for the Site is question of indoor air contamination down-gradient from the Site (Unifirst).

1.A. What is your overall impression of the project? (general sentiment)

Ms. McWeeney stated that overall the project is good but it is too bad that the project has stalled out. Also, she is concerned about the possibility of indoor air issues down-gradient of the Site (Unifirst).

2.A. Have there been routine communication or activities (site visits, inspections) involving your office regarding the site? If so, please give purpose and results.

None for MassDEP.

3.A. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office. If so, please give details of the events and results of the response.

No complaints

4.A. Do you feel well informed about the site's activities and progress?

Ms. McWeeney stated that she is relatively well informed. She suggested regular (undetermined interval, monthly?) conference calls with EPA, MassDEP and contractors conducting work to help keep everyone informaned and on the same page.

5.A. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Ms. McWeeney stated that Joe LeMay is a great project manager but she would like to make sure that the indoor issue doesn't linger for a long time. And if the PRPs stall she would like to see the EPA step in a get the work done.

SUPPLEMENTAL QUESTIONS

1.B. What concerns do you have about the site?

Ms. McWeeney stated that the indoor air issue is covered previous questions. She also is concerned that the PRPs are not going to act on the indoor air issue.

2.B. Are you aware of any community concerns regarding the site? Provide details.

None other than indoor air.

3.B. Have the activities to date at the site helped the neighborhood and/or community?

No

4.B. Are you aware of any events of vandalism or trespassing at the site?

No.

5.B. Are you aware of any changes in projected land use at or near the site?

The possible development at the W.R. Grace site.

6.B. We understand that groundwater from that site may be used in the distant future. Are there plans for use of groundwater at the site in the near term?

Ms. McWeeney stated not for potable water. There might be some production wells for industry.

7.B. Are there any pending changes in laws or regulations that may impact the site?

No.

8.B. Do you have any suggestions or recommendations regarding the project?

Ms. McWeeney stated that the indoor air question should not drag on. EPA should be

ready with a plan B to step in and get answers.

9.B. Is there any other information that you wish to share that might be of use?

None other than that which is addressed previously.

INTERVIEW RECORD

Site Name: Wells G&H Superfund Site	**EPA ID No.:** MAD980732168	
Subject: Five Year Review	**Time:** 3:30 PM	**Date:** 7/9/2009
Type: ■ Telephone ☐ Visit ☐ Other **Location of Visit:** Woburn City Hall	☐ Incoming ☐ Outgoing N/A	

Contact Made By:		
Name: **Diane Silverman**	**Title:** **Risk Assessor**	**Organization:** **TRC .**
Individual Contacted:		
Name: **Thomas McLaughlin**	**Title:** **Mayor**	**Organization:** **City of Woburn**
Telephone: 781-897-5901 **Fax No.** **E-mail Address:** **TMcLaughlin@cityofwoburn.com**	**Street Address:** **Woburn City Hall** **10 Common Street** **Woburn, MA01801**	

Preface: Mayor McLaughlin expressed that he has limited expertise in the area of hazardous waste sites, and does not have a long history of involvement with the site. The Mayor was given some brief background on the focus of the interview (the sources area properties – OU1) before the interview began.

5-YEAR REVIEW QUESTIONS FOR STATE/LOCAL OFFICIALS

1.A. What is your overall impression of the project? (general sentiment)

The Mayor's overall impression is favorable in that the PRPs and EPA are working together cooperatively to address the site. He is pleased that the community has been allowed to participate in the process and provide comments on the cleanup. He hopes that active community involvement will be encouraged to continue in the future.

2.A. Have there been routine communication or activities (site visits, inspections) involving your office regarding the site? If so, please give purpose and results.

The Mayor characterized the communication from EPA and the PRPs as "extensive". He mentioned a number of meetings in Boston and Woburn covering a variety of topics such as ownership, the remedies, and other issues of cleanup and mitigation. Though the Mayor has not specifically visited those areas of the site that are difficult to access, he has been to see the Hall Brook Holding Area where the coffer dam is to be installed, and he routinely rides by other site areas including the now-abandoned Grace property and the Cranberry Bog area.

3.A. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office. If so, please give details of the events and results of the response.

The Mayor stated that he is not aware of any complaints concerning the site. He feels that it is almost as though the community has "turned the page" on the past.

4.A. Do you feel well informed about the site's activities and progress?

The Mayor replied "Yes". He primarily receives information from the City's law firm which is dealing directly with EPA. The lawyers regularly update the Mayor on activities and progress. The Mayor has also attended meetings with EPA and PRP presentations. There was a special City Council meeting last year with the EPA RPM, Joe LeMay, who gave a presentation on activities and progress at the site which was informative.

5.A. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
The Mayor felt that the most important thing for EPA to do would be to continue the good communication and information transfer that has been occurring. He hopes that the communication might get even better when the PRPs begin working more actively so that the City can be well informed. He gave an example concerning the possible future trucking of contaminated materials on City streets. It would be important for the City to be informed of this type of activity in advance so that there would be no surprises and his office would be able to address community concerns as soon as they are voiced.

SUPPLEMENTAL QUESTIONS

1.B. What concerns do you have about the site?

The Mayor's primary concerns are for public health and safety. He is glad that EPA is involved and is providing oversight. He reiterated that he could have future concerns, if the City is not kept as informed as possible during future remedial activities that could impact nearby residential areas.

2.B. Are you aware of any community concerns regarding the site? Provide details.
The Mayor stated that he is not presently aware of any community concerns and commented once again that it seems as though the community has almost turned the page on the past.

3.B. Have the activities to date at the site helped the neighborhood and/or community?
The Mayor stated that the work to date has helped the community resolved the long standing issues associated with the site. The community appears to be getting over the past.

4.B. Are you aware of any events of vandalism or trespassing at the site?
The Mayor replied "None".

5.B. Are you aware of any changes in projected land use at or near the site?
The Mayor replied that he is unaware of any change in land use at or near the site.

6.B. We understand that groundwater from that site may be used in the distant future. Are there plans for use of groundwater at the site in the near term?
The Mayor replied that there are not any plans in the near term for groundwater use at the site.

7.B. Are there any pending changes in laws or regulations that may impact the site?

The Mayor replied that he is aware that the settlement between EPA and the PRPs may require the need for institutional controls on properties in the future. He stated that the City will cooperate to implement any necessary land use restrictions. The Mayor further stated that he is not aware of any changes in laws that would impact the site.

8.B. Do you have any suggestions or recommendations regarding the project?

The Mayor reiterated that it is going to be important for the communication from EPA and the PRPs to continue to be just as good or even better as the remediation become more active. His office receives calls from PRP contractors asking for permission to access properties. He would like this to continue in the future so he is aware of the type of work that is occurring. He wants his office to be able to keep residents informed of actions near their neighborhood and he does not want to be surprised by activities that he was unaware of. Continued cooperation and communication will be important moving forward.

9.B. Is there any other information that you wish to share that might be of use?

The Mayor replied "None at this time".

INTERVIEW RECORD

Site Name: Wells G&H Superfund Site	**EPA ID No.:** MAD980732168	
Subject: Five Year Review	**Time:** 10:15 AM	**Date:** 6/4/09
Type: ■ Telephone ☐ Visit ☐ Other **Location of Visit:** Phone Call	☐ Incoming ■ Outgoing	

Contact Made By:

Name: Diane Silverman, Ph.D.	**Title:** Risk Assessor	**Organization:** TRC

Individual Contacted:

Name: John (Jack) Fralick Jr.	**Title:** Health Agent	**Organization:** Board of Health, City of Woburn
Telephone No.: 781-932-4408 **Fax No.:** **E-Mail Address:** jfralick@cityofwoburn.com	**Street Address:** Woburn City Hall 10 Common Street Woburn, MA 01801	

5-YEAR REVIEW QUESTIONS FOR STATE/LOCAL OFFICIALS

1. What is your overall impression of the project? (general sentiment)

Though Mr. Fralick stated that he understands the complexities of the site and that there is no way to speed up some of the processes such as groundwater treatment, the project appears to be moving very slowly. The data on contaminant removal indicate that only small amounts of chemicals have been removed from groundwater over the past few years. The slowness of the removal may mean a restored water supply in 30 to 40 years, perhaps in time to fulfill a need for potable water. He further stated that he does not agree with the City's position on proposed reuse of the Wells G&H wetland area as walking trails. He believes that the wetland should be left undisturbed especially since there are two arsenic hot spots that are located within close proximity to the proposed walking trails.

2. Have there been routine communication or activities (site visits, inspections) involving your office regarding the site? If so, please give purpose and results.

Mr. Fralick stated "No" to this question, other than periodic visits to the wetland areas to make sure no illegal dumping has occurred. He did visit and inspect the Grace property and monitored the building demolition, which is now a vacant parcel of land as there is no longer a buyer for the property. Mr. Fralick only periodically drives by the other source area properties since there is nothing to see or do at these properties.

3. Have there been any complaints, violations, or other incidents related to the

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office. If so, please give details of the events and results of the response.

Mr. Fralick responded "None" to this question.

4. Do you feel well informed about the site's activities and progress?

Mr. Fralick responded affirmatively to this question. He stated that there are voluminous reports available for him to obtain information from. He further stated that he agrees with EPA's decision to combine Wells G&H OU-3 with the Indutri-Plex Site since there is no clean zone between these two sites. The remediation efforts to date at the Halls Brook Holding Area of the Indutri-Plex site have minimized complaints and concerns from downstream property owners concerning releases from the upstream source.

5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Mr. Fralick replied "No, none". He further commented that the site, though relatively innocuous in its present state, has not ceased to be a source of stigma to the community. Though he is not concerned about new releases from the site, he routinely receives calls from individuals who were exposed in the past looking for answers for recent adverse health diagnoses, perhaps caused by site-related exposures that occurred 30 years ago. He also routinely receives calls from individuals asking if the community is a safe place to move to. He stated that he responds that he has raised his family in Woburn and has no concerns about the safety of living in the community.

INTERVIEW RECORD

Site Name: Wells G&H Superfund Site	**EPA ID No.:** MAD980732168	
Subject: Five Year Review	**Time:** 12:31PM	**Date:** 7/12/09
Type: ☐ Telephone ☐ Visit ■ Other **Location of Visit:** Email Response	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: N. Scott Buchanan	**Title:** Project Manager	**Organization:** TRC

Individual Contacted:

Name: Michael Raymond Linda Raymond	**Title:** Ward 6 Alderman Environmental Activist	**Organization:** City of Woburn Aberjona River Study Coalition, Inc.
Telephone No.: 781-935-2438 **Fax No.:** **E-Mail Address:** fitwalker1@aol.com	**Street Address:**	

Preface:
As Ward 6 Alderman of North Woburn I was present at a Woburn City Council public meeting when EPA Project Manager, Joe LeMay presented his 2008 update overview of Wells G & H site and the Industri-plex site. As his presentation was very informative I want to also make note that more periodic updates need to be shared with the community.

5-YEAR REVIEW QUESTIONS FOR COMMUNITY

1.A. What is your overall impression of the project? (general sentiment)

It is taking too long for the clean-up process to begin.

2.A. What effects have site operations had on the surrounding community?

None that I am aware of.

3.A. Are you aware of any community concerns regarding the site's operation and administration? If so, please give details.

I have a major concern that both sites will never be cleaned-up.

4.A. Are you aware of any events, incidents, or activities at the site (such as emergency responses)? If so, please give details.

No

5.A. Do you feel well informed about the site's activities and progress?

No, I do not feel well informed about the site's activities and progress.

More communication in a form of a newsletter or by email and or by a community meeting from the EPA is needed. The City of Woburn also has local cable that was also noted in the last 5-year review for communication.

The Aberjona Study Coalition, Inc. is a conduit for information. We have a web site www.aberjonastudy.com to share information. As a recipient of a double TAG, ASC along with our technical advisor, Cambridge Environmental, Inc. should receive periodic information regarding both Wells G & H and the Industri-Plex sites. ASC represents over 225,000 people residing along the Aberjona River. We have a responsibility to keep these residents informed. Please note, not everyone has access to a computer to read the EPA web site.

EPA Project Manager, Joe LeMay did present an overview in 2008 to the Woburn City Council and the public was invited to attend. Very few residents, mostly representatives of PRP's and City Officials including members of ASC and our Technical Advisors of Cambridge Environmental were present. The EPA must improve their method of keeping the community updated more often.

6.A. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

I do hope that the EPA continues to work with the DEP. The sharing of information is vital not only for the cleanup of these sites but also for the well being of those who reside in our communities.

SUPPLEMENTAL QUESTIONS FOR COMMUNITY GROUPS

1.B. What concerns do you have about the site?

One of my concerns is that Wells G & H should remain closed for perpetuity. I also have a concern that a band-aid approach will be used not only with Wells G & H but also with the Industri-plex site.

2.B. Are you aware of any other community concerns regarding the site? Provide details.

Since the last 5-year review the major concern was that the cleanup of both Wells G & H and the Industri-plex would have taken place and it has not. It has been approximately 30 years since this all began. I find it unacceptable that the cleanup has not been done nor has started.

Yes, some residents in Winchester are very concerned about flooding. Especially those that live downstream from the bridge near the Pond View Apartments. A 21E site is located in the flood zone.

Another concern is the future development of WR Grace site. There is no way to escape the stigma. It will always be there.

The Rifle Range is still a concern of many with lead contamination.

The Cranberry Bogs, there are residents who volunteer to keep the site cleaned but do not seem the least concerned with hot spots as noted by the EPA.

3.B. Have the activities to date at the site helped the neighborhood and/or community?

Nothing has happened at the site since the last 5-year review that the community and or neighborhood have been publicly aware that I know of.

4.B. Are you aware of any events of vandalism or trespassing at the site?

No

5.B. Are you aware of any other activities at the site that might be of importance (e.g., flooding)?

No

6.B. Are you aware of any changes in projected land use at or near the site?

Yes, the construction of an Ice Rink on Salem Street with possible altering the flood zone.

7.B. Is there any sentiment from the community about the future use of groundwater from the site?

Yes, there will always be the fear of contamination of groundwater from Wells G & H and the Industri-Plex sites, for contamination knows no boundary.

8.B. *Do you have any suggestions or recommendations regarding the project?*

Yes, educate our children.

The EPA should reach out to local schools in the community by speaking to students in science classrooms to educate middle and high school students. Wells G & H Superfund site and Industri-plex site is part of "Woburn's History and Future" and it is a lesson that must be taught to students so that future generations will not make the same mistakes.

9.B. Is there any other information that you wish to share that might be of use?

The information that I would like to share is that I have reviewed the last 5-year review and noticed that some of the comments of concern made then still apply today.

From: [redacted]
Sent: Wednesday, July 15, 2009 12:34 AM
To: [redacted]
Cc: [redacted]
Subject: WELL G&H FIVE YEAR REVIEW

Dear Scott,

I am sending my reply to you for the record, however, I do not have the format to answer your questions.

There are a few comments that I would like to share with you and the others.

First of all, I did not receive any mail or telephone call from you or your office regarding the survey (online). It was through Linda Raymond notifying me,that I am aware 5 years have passed since our last meeting. I guess I was disappointed to be informed through my friends.
Over the 30+years of contamination awareness, nothing much has really happened to clean it up. It is 30+ years of millions of dollars worth of paper pushing and politics. Millions of dollars that could have done the job.
Since there is no obvious activity noted or any attempts to cleanup the "Wells" area, it was easy to *not* recognize the 5 years passing by.

I have been to the "Wells" at least 4-5 times giving tours, and the only thing that has changed in the 5 year period is the dumping of left over road work supplies from the City of Woburn, and likely some free-loader needing a place to empty trash.
Now as we hear about the budget cuts, project cuts, people cuts,whatever else cuts, I do not expect that there will be any attempt to clean up the sites, nor will there be any funds slotted especially for any cleanups.

I feel that the email questionaire online is useless and just a repeat of what was said 5 years ago. Just another delay tactic..
It will not change anything!
At this point 30 years later, I am so discouraged to see so little done in Woburn regarding site clean ups
In the meantime how many citizens/children will become a new statistic?
Thank you for your time,
Donna Robbins
12 Wyman St.
Woburn, MA 01801
ph [redacted]
cell [redacted]

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INTERVIEW RECORD

Site Name: Wells G&H Superfund Site	**EPA ID No.:** MAD980732168	
Subject: Five Year Review	**Time:** 2:20PM	**Date:** 7/14/09
Type: ☐ Telephone ☐ Visit ■ Other **Location of Visit:** Email Response	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: N. Scott Buchanan	**Title:** Project Manager	**Organization:** TRC

Individual Contacted:

Name: Kathleen Barry	**Title:** Environmental Activist	**Organization:** Aberjona River Study Coalition, Inc.
Telephone No.: 617-719-3104 **Fax No.:** **E-Mail Address:** kbarry4dpt@aol.com	**Street Address:**	

5-YEAR REVIEW QUESTIONS FOR COMMUNITY

1.A. What is your overall impression of the project? (general sentiment)

I feel that the project is taking exceptionally long. I had expected this as a lengthy and complex process, however, all I have seen is study after study without any action. It is disconcerting to realize that this process will be extended further as the PRPs study the effectiveness of the EPA proposed remediation at the Halls Brook Holding Area. I agree that this analysis is important as questions have arisen about the proposed plan's veracity and proven effectiveness. I can't help but wonder that once this remediation gets underway there then may be another more effective technology available.

2.A. What effects have site operations had on the surrounding community?

I am not aware of any negative issues or adverse community impacts with site operations.

3.A. Are you aware of any community concerns regarding the site's operation and administration? If so, please give details.

Yes. A general sentiment that the site will never be cleaned up: that the process enables stall tactics under the guise of checks and balances: that the lawyers and the PRP's consultants will continue to extend the process and delay implementation.

4.A. Are you aware of any events, incidents, or activities at the site (such as emergency responses)? If so, please give details.

No

5.A. Do you feel well informed about the site's activities and progress?

No, not at the present time. EPA's project manager presented an update to the Woburn City Council about 6 months ago. Had I not received word of this presentation, albeit late, I would not have known where the project stood. The EPA was very much engaged with the community and the Aberjona Study Coalition (ASC) initially, I feel that there has been a huge lapse in communication and public information regarding the project. The charge of the ASC is to act as a conduit of information from the EPA to the public. EPA as of late, has not used this vehicle of communication.

6.A. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

I would like to see the EPA and project management work closely with the state's environmental agency to assure a complete and comprehensive understanding of the further sections of the Aberjona. I would specifically ask that the project management work closely with the EPA's project management at the Olin Superfund Site in Wilmington with specific concerns regarding contamination of the Aberjona in the upper reaches.

It would be appreciated if these collaborations be more transparent and all inquiries and communication be made public.

SUPPLEMENTAL QUESTIONS FOR COMMUNITY GROUPS

1.B. What concerns do you have about the site?

I have a big concern about the effectiveness of the proposed remediation at the Halls Brook Holding Area, and re-development and land use alternatives for the Wells G&H site whereas certain areas at this site, although deep within the wetland sections are highly contaminated.

2.B. Are you aware of any other community concerns regarding the site? Provide details.

I believe that the history of this site provides enough community concern and detail. The people of Woburn, Winchester and surrounding towns are weary and wary of the presence of contamination in their community. They have paid a heavy price because of it and are suspect to the process that professes clean up and public safety. This Community has fought those responsible and has failed to see initiatives from them that would instill confidence. EPA's process relies on the PRP's taking responsibility and EPA has offered the community a blue-print so-to-speak on how they will clean it up and afford public safety. The community needs to see ACTION to be confident. They have seen and experienced everything BUT.

3.B. Have the activities to date at the site helped the neighborhood and/or community?

No

4.B. Are you aware of any events of vandalism or trespassing at the site?

No

5.B. Are you aware of any other activities at the site that might be of importance (e.g., flooding)?

No

6.B. Are you aware of any changes in projected land use at or near the site?

Yes. There has been construction of an ice rink which is also operational on Salem Street near Wells G&H. There is concern that this recent construction will alter the flood plain and create more havoc with motility of contaminated surface water and subsurface contaminated soils.

7.B. Is there any sentiment from the community about the future use of groundwater from the site?

Yes there has been strong anti-sentiment expressed about any future use of groundwater at the Wells G&H site and for good reason. There is nothing that supports that the groundwater especially deep within the heavily contaminated sediment in the wetlands is safe for any use. Considering the infamous history at this site, proposing any future use would show a blatant indifference to the community and would only suit to add more insult to the many injuries already suffered.

8.B. Do you have any suggestions or recommendations regarding the project?

Only the recommendations and suggestions I have made above and in the previous 5 year interview

9.B. Is there any other information that you wish to share that might be of use?

Not at this time.

ATTACHMENT 7

ARARS REVIEW

TABLE A7-1. LOCATION-SPECIFIC ARARS WELLS G&H SITE - OU-1				
SITE FEATURES	**REQUIREMENTS**	**ORIGINAL STATUS**	**REQUIREMENT SYNOPSIS AND APPLICATION FOR THE RI/FS**	**THIRD FIVE-YEAR REVIEW**
Federal Regulatory Requirements	RCRA - Location Standards (40 CFR 264.18). Alternatives SC-10 and MOM-2	Applicable	This regulation outlines the requirements for constructing a RCRA facility on a 100-year floodplain. A facility located on a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood, unless waste may be removed safely before floodwater can reach the facility, or no adverse effects on human health and the environment would result if washout occurred.	These requirements remain applicable. The ROD assumed that remediation facilities would be located outside the floodplain or designed to allow quick mobilization out of the area and to prevent damage by initial floodwaters. The management of RCRA regulated wastes takes place outside the floodplain.
Federal Regulatory Requirements	CWA - Section 404 Dredge and Fill Requirements (Guidelines at 40 CFR 230). Alternatives SC-10 and MOM-2	Applicable	For activities under Section 404 jurisdiction, the governing regulations favor practicable alternatives that have less impact on wetlands. If no practicable alternative exists, impacts must be mitigated.	Activities at the Source Areas were conducted in accordance with these requirements.
Federal Regulatory Requirements	Wetlands Executive Order (EO 11990). Alternatives SC-10 and MOM-2	Applicable	Under this Executive Order, federal agencies are required to select alternatives that minimize the destruction, loss or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands. If no practicable alternative exists impacts must be mitigated	Activities at the Source Areas were conducted in accordance with these requirements.

TABLE A7-1. LOCATION-SPECIFIC ARARS WELLS G&H SITE - OU-1				
SITE FEATURES	**REQUIREMENTS**	**ORIGINAL STATUS**	**REQUIREMENT SYNOPSIS AND APPLICATION FOR THE RI/FS**	**THIRD FIVE-YEAR REVIEW**
Federal Regulatory Requirements	Floodplains Executive Order (EO 11888). Alternatives SC-10 and MOM-2	Applicable	Federal agencies are required to reduce the risk of flood loss, to minimize impact of floods, and to restore and preserve the natural and beneficial value of floodplains. In addition, practicable alternatives must be selected that have less impact on wetlands.	Activities at the Source Areas were conducted in accordance with these requirements. No PRP facility is proposing further work in the floodplain.
Federal Regulatory Requirements	Protection of Archaeological Resources (32 CFR 229). Alternative SC-10	Status not provided in ROD	These regulations develop procedures for the protection of archaeological resources.	Archeological resources were not discovered during response actions and are not expected to be in the future.
State Regulatory Requirements	Massachusetts Wetlands Protection Requirements (310 CMR 10.00). Alternatives SC-10 and MOM-2	Applicable	These requirements control regulated activities in freshwater wetlands, 100 year floodplains, and 100 foot buffer zones beyond these areas. Regulated activities include virtually any construction or excavation activity. Performance standards are provided for evaluation of the acceptability of various activities.	Activities at the Source Areas were conducted in accordance with these requirements.
State Regulatory Requirements	Massachusetts Waterways Licenses (310 CMR 9.00). Alternative MOM-2	Applicable	Controls dredging, filling, and other work in water of the Commonwealth.	The centralized treatment facility for the Wells G&H Source Areas is no longer a component of the remedy; therefore, these requirements are not applicable to OU-1.
State Regulatory Requirements	Inland Wetland Orders (302 CMR 6.00). Alternative MOM-2	Relevant and Appropriate	Defines wetland areas, establishes encroachment lines along waterways or floodplain areas, and regulates activities in these areas.	The centralized treatment facility is no longer a component of the remedy; therefore, these requirements are not relevant and appropriate.

TABLE A7-1. LOCATION-SPECIFIC ARARS WELLS G&H SITE - OU-1				
SITE FEATURES	**REQUIREMENTS**	**ORIGINAL STATUS**	**REQUIREMENT SYNOPSIS AND APPLICATION FOR THE RI/FS**	**THIRD FIVE-YEAR REVIEW**
State Regulatory Requirements	Operation and Maintenance and Pretreatment Standards for Waste Water Treatment Works and Indirect Discharges (314 CMR 12.0). Alternative MOM-2	Relevant and Appropriate	Insures the proper operation and maintenance of waste water treatment facilities including operation and maintenance, sampling, and discharges.	These requirements remain relevant and appropriate. Proper operation, maintenance, sampling and discharge procedures are being complied with at the UniFirst, Grace and Wildwood facilities.

TABLE A7-2. CHEMICAL-SPECIFIC ARARs AND TBCs WELLS G&H SITE - OU-1				
SITE FEATURES	**REQUIREMENTS**	**ORIGINAL STATUS**	**REQUIREMENT SYNOPSIS AND APPLICATION FOR THE RI/FS**	**THIRD FIVE-YEAR REVIEW**
Federal Regulatory Requirements	SDWA - Maximum Contaminant Levels (MCLs) (40 CFR 141.11 - 141.16)	Relevant and Appropriate	MCLs have been promulgated for a number of common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers potentially used for drinking water.	The MCL for arsenic in drinking water has decreased since the 1988 Endangerment Assessment. Manganese was not originally identified as a COC in groundwater, but concentrations have historically exceeded the current health advisory. Groundwater is not being used at OU-1; nonetheless, these requirements remain relevant and appropriate.
Federal Regulatory Requirements	RCRA - Maximum Concentration Limits (MCLs) (40 CFR 264.94)	Relevant and Appropriate	RCRA MCLs provide groundwater protection standards for 14 common contaminants. All are equal to the SDWA MCLs for those contaminants.	The MCL for arsenic in drinking water has decreased since the 1988 Endangerment Assessment. Manganese was not originally identified as a COC in groundwater, but concentrations have historically exceeded the current health advisory. Groundwater is not being used at OU-1; nonetheless, these requirements remain relevant and appropriate.
Federal Regulatory Requirements	CWA - Ambient Water Quality Criteria (AWQC) - Protection of Freshwater Aquatic Life, Human Health - Fish Consumption	Relevant and Appropriate	AWQC are developed under the Clean Water Act (CWA) as guidelines from which states develop water quality standards.	AWQC have been updated since the 1989 ROD (EPA-822-R-02-047, November 2002 and EPA-822-F-03-012, December 2003). These criteria remain relevant and appropriate but as an action specific ARAR in evaluating NPDES discharge requirements.

TABLE A7-2. CHEMICAL-SPECIFIC ARARs AND TBCs WELLS G&H SITE - OU-1				
SITE FEATURES	**REQUIREMENTS**	**ORIGINAL STATUS**	**REQUIREMENT SYNOPSIS AND APPLICATION FOR THE RI/FS**	**THIRD FIVE-YEAR REVIEW**
State Regulatory Requirements	Massachusetts Drinking Water Regulations Maximum Contaminant Levels (MCLs) (310 CMR 22.00)	Relevant and Appropriate	Massachusetts MCLs establish levels of contaminants allowable in public water supplies. They are essentially equivalent to SDWA MCLs.	The MCL for arsenic in drinking water has decreased since the 1988 Endangerment Assessment. Manganese was not originally identified as a COC in groundwater, but concentrations have historically exceeded the current health advisory. Groundwater is not being used at OU-1; nonetheless, these requirements remain relevant and appropriate.
State Regulatory Requirements	Massachusetts Groundwater Quality Standards (314 CMR 6.00)	Relevant and Appropriate	These standards consist of groundwater classifications which designate and assign the uses of Commonwealth groundwaters, and water quality criteria necessary to sustain these uses. There is a presumption that all groundwaters are Class I.	These standards remain relevant and appropriate.
Federal Criteria, Guidance, Advisories to be Considered	EPA Risk Reference Doses (RfDs)	TBC	RfDs are dose levels developed by the EPA for noncarcinogenic effects. Other toxicity values have changed also. See text.	These requirements remain TBCs.
	EPA Carcinogen Assessment Group Potency Factors	TBC	Potency Factors are developed by the EPA from Health Assessments or evaluation by the Carcinogen Efforts Assessment Group. Note that potency factors have changed since the Endangerment Assessment. See text for additional information.	These requirements remain TBCs.
	Massachusetts Drinking Water Health Advisories	TBC	MADEP Health Advisories are guidance criteria for drinking water.	These guidelines remain TBCs.

TABLE A7-3. ACTION-SPECIFIC ARARS WELLS G&H SITE - OU-1				
SITE FEATURES	**REQUIREMENTS**	**ORIGINAL STATUS**	**REQUIREMENT SYNOPSIS AND APPLICATION FOR THE RI/FS**	**THIRD FIVE-YEAR REVIEW**
Federal Regulatory Requirements	RCRA - General Facility Requirements (40 CFR 264.10 264.18). Alternatives SC-10 and MOM-2.	Relevant and Appropriate	General facility requirements outline general waste security measures, inspections, and training requirements.	These requirements remain relevant and appropriate and have been complied with.
Federal Regulatory Requirements	RCRA - Incineration Requirements (40 CFR 264 Subpart 0). Alternative SC-10.	Relevant and Appropriate	Principal Organic Hazardous Constituents (POHC) are to be destroyed to 99.99 percent destruction and removal efficiency, stringent particulate and HCL limits are imposed.	The Explanation of Significant Differences (ESD) eliminated on-site incineration component required by the ROD in favor of off-site incineration and disposal of soil from Wildwood, NEP and Olympia. In-situ volatilization of soil would be used on the UniFirst property. Therefore, these requirements are no longer relevant and appropriate.
Federal Regulatory Requirements	RCRA - Land Disposal Restrictions (40 CFR 268). Alternatives SC-10 and MOM-2	Applicable	Provides treatment standards and schedules governing land disposal of RCRA wastes and of materials contaminated with or derived from RCRA wastes.	The ESD eliminated on-site incineration component required by the ROD in favor of off-site incineration and disposal of soil from Wildwood, NEP and Olympia. In-situ volatilization of soil would be used on the UniFirst property. Therefore, these requirements are no longer relevant and appropriate.
Federal Regulatory Requirements	TSCA - PCB Incineration Requirements (40 CFR 761.70(a)(2) (b). Alternative SC-10.	Applicable	Contaminated soil in excess of 50 ppm PCB concentration must be incinerated to a 99.9999 percent destruction efficiency.	The ESD eliminated on-site incineration component required by the ROD in favor of off-site incineration and disposal of soil from Wildwood, NEP and Olympia. Therefore, these requirements are no longer applicable.

TABLE A7-3. ACTION-SPECIFIC ARARS WELLS G&H SITE - OU-1				
SITE FEATURES	**REQUIREMENTS**	**ORIGINAL STATUS**	**REQUIREMENT SYNOPSIS AND APPLICATION FOR THE RI/FS**	**THIRD FIVE-YEAR REVIEW**
Federal Regulatory Requirements	RCRA - Generator and Transporter Responsibilities (40 CFR 262 and 263). Alternatives SC-10 and MOM-2.	Relevant and Appropriate	Provides standards for packing and accumulating hazardous waste prior to off site disposal.	These requirements remain relevant and appropriate.
Federal Regulatory Requirements	RCRA - Container Requirements (40 CFR 264 Subpart I). Alternatives SC-10 and MOM-2.	Relevant and Appropriate	This regulation sets forth RCRA requirements for use and management of containers at RCRA facilities.	These requirements remain relevant and appropriate and have been complied with. On-site treatment systems continue to generate RCRA regulated waste materials and must comply with container requirements.
Federal Regulatory Requirements	DOT - Transportation of Hazardous Waste Requirements (49 CFR 171 179). Alternatives SC-10 and MOM-2.	Relevant and Appropriate	Those regulations set forth DOT requirements for transportation of hazardous waste. These are generally identical to RCRA requirements at 40 CFR 263.	These requirements are off-site requirements and are not ARARs per se. All applicable requirements will be met.
Federal Regulatory Requirements	RCRA - Tank Requirements (40 CFR 264 Subpart J). Alternative SC-10.	Relevant and Appropriate	Provides design and operating requirements for RCRA waste treatment facilities utilizing tanks.	These requirements remain relevant and appropriate. Note that none of the PRP sites maintain hazardous waste tanks at this time.
Federal Regulatory Requirements	RCRA - Preparedness and Prevention (40 CFR 264.30 264.31). Alternatives SC-10 and MOM-2.	Relevant and Appropriate	This regulation outlines requirements for safety equipment and spill control.	These requirements remain relevant and appropriate and have been complied with.
Federal Regulatory Requirements	RCRA - Contingency Plan and Emergency Procedures (40 CFR 264.50 264.56). Alternatives SC-10 and MOM-2.	Relevant and Appropriate	This regulation outlines the requirements for emergency procedures to be used following explosions, fires, etc.	These requirements remain relevant and appropriate and have been complied with.
Federal Regulatory Requirements	RCRA - Manifesting, Recordkeeping, and Reporting (40 CFR 264.70 264.77). Alternatives SC-10 and MOM-2.	Relevant and Appropriate	This regulation specifies the recordkeeping and reporting requirements for RCRA facilities.	These requirements remain relevant and appropriate and have been complied with.

TABLE A7-3. ACTION-SPECIFIC ARARS WELLS G&H SITE - OU-1				
SITE FEATURES	**REQUIREMENTS**	**ORIGINAL STATUS**	**REQUIREMENT SYNOPSIS AND APPLICATION FOR THE RI/FS**	**THIRD FIVE-YEAR REVIEW**
Federal Regulatory Requirements	RCRA - Closure and Post Closure (40 CFR 264 Subpart G). Alternative SC-10.	Relevant and Appropriate	This regulation details the specific requirements for closure and post-closure care of hazardous waste facilities.	Closure requirements may be relevant and appropriate to soil cleanups.
Federal Regulatory Requirements	OSHA - General Industry Standards (29 CFR 1910). Alternatives SC-10 and MOM-2.	Applicable	This regulation specifies the 8 hour, time - weighted average concentration for various organic compounds and 2 PCB compounds; site control procedures; training; and protective clothing requirements for worker protection at site remediations.	These requirements are not environmental standards and therefore, are not ARARs. However, they are health and safety requirements that are required to be met.
Federal Regulatory Requirements	OSHA - Safety and Health Standards (29 CFR 1926). Alternatives SC-10 and MOM-2.	Applicable	This regulation specifies the type of safety equipment and procedures to be followed during construction and excavation activities.	These requirements are not environmental standards and therefore are not ARARs. However, they are health and safety requirements that are required to be met.
Federal Regulatory Requirements	OSHA - Recordkeeping, Reporting and Related Regulations (29 CFR 1904). Alternatives SC-10 and MOM-2.	Applicable	The regulation outlines the recordkeeping and reporting requirements for an employer under OSHA.	These requirements are not environmental standards and therefore are not ARARs. However, they are health and safety requirements that are required to be met.
Federal Regulatory Requirements	TSCA - Marking of PCBs and PCB Items (40 CFR 761.40 761.79). Alternative SC-10.	Applicable	50 ppm PCB storage areas, storage items, and transport equipment must be marked with the HL mark.	These requirements have been complied with.

TABLE A7-3. ACTION-SPECIFIC ARARS WELLS G&H SITE - OU-1				
SITE FEATURES	**REQUIREMENTS**	**ORIGINAL STATUS**	**REQUIREMENT SYNOPSIS AND APPLICATION FOR THE RI/FS**	**THIRD FIVE-YEAR REVIEW**
Federal Regulatory Requirements	TSCA - Storage and Disposal (40 CFR 761.60 761.79). Alternative SC-10.	Applicable	This requirement specifies the requirements for storage and disposal/destruction of PCBs in excess of 50 ppm. These PCB-contaminated soils would have to be disposed of or treated in a facility permitted for PCBs, in compliance with TSCA regulations. Treatment must be performed using incineration or some other method with equivalent destruction efficiencies.	The storage requirements were complied with during soil excavation. Disposal requirements were not applicable since soil was shipped off-site.
Federal Regulatory Requirements	TSCA - Records and Reports (40 CFR 761.18 761.185). Alternative SC-10.	Applicable	This regulation outlines the requirements for recordkeeping for storage and disposal of >50 ppm PCBs.	These requirements were complied with.
Federal Regulatory Requirements	CAA - National Air Quality Standards for Total Suspended Particulates (40 CFR 129.105, 750). Alternatives SC-10 and MOM-2.	Applicable	This regulation specifies maximum primary and secondary 24 hour concentrations for particulate matter.	These requirements are not ARARs, but rather the regulations promulgated by states as part of their state implementation pursuant to standards would be applicable.
Federal Criteria Guidance Advisories to be Considered	RCRA - Proposed Air Emission Standards for Treatment Facilities (52 FR 3748, February 5, 1987). Alternatives SC-10 and MOM-2.	TBC	This proposal would set performance standards for RCRA treatment facility air emissions.	These requirements are TBCs for the Wildwood vapor collection system and are being complied with.
Federal Criteria Guidance Advisories to be Considered	EPA Groundwater Protection Strategy. Alternative MOM-2.	TBC	EPA Classifies groundwater into three categories depending on current, past or potential use. This serves as a guide for protection of the resource.	Wells G&H aquifer is a Class II B aquifer - potentially useable aquifer. At the end of remediation, the MOM alternative will attain standards for Class II B aquifers.
Federal Criteria Guidance Advisories to be Considered	USEPA office of Solid Waste and Emergency Response, Directive 9355.0-28; Air Stripper Control Guidance. Alternative MOM-2.	TBC	Establishes guidance on the control of air emissions from air strippers used at Superfund sites for groundwater treatment.	These requirements are TBCs for the Wildwood vapor collection system and are being complied with.

TABLE A7-3. ACTION-SPECIFIC ARARS WELLS G&H SITE - OU-1				
SITE FEATURES	**REQUIREMENTS**	**ORIGINAL STATUS**	**REQUIREMENT SYNOPSIS AND APPLICATION FOR THE RI/FS**	**THIRD FIVE-YEAR REVIEW**
State Regulatory Requirements	Massachusetts Certification for Dredging and Filling (314 CMR 9.00). Alternative MOM-2.	Applicable	Establishes water quality-based standards for filling activities (CWA Section 401).	The Central Area treatment facility is no longer a component of the remedy; therefore these requirements are not applicable.
State Regulatory Requirements	Surface Water Discharge Permit Program Requirements (314 CMR 3.00). Alternative MOM-2.	Applicable	Provides permitting process for surface water body point discharges. This requirement is generally identical to CWA NPDES.	These requirements remain applicable and have been complied with but limits established may be revisited.
State Regulatory Requirements	Surface Water Quality Standards (314 CMR 4.00) Alternative MOM-2.	Applicable	This regulation consists of surface water classifications which designate and assign uses, and water quality criteria necessary to sustain the designated uses.	These requirements remain applicable and have been complied with.
State Regulatory Requirements	Groundwater Quality Standards (314 CMR 6.00) and Groundwater Discharge Permit Program (314 CMR 5.00). Alternative MOM-2.	Applicable	This regulation consists of groundwater classifications which designate and assign uses, and water quality criteria necessary to sustain the designated uses.	This requirement remains applicable. Class I groundwater quality criteria will be achieved at the end of the remediation process.
State Regulatory Requirements	Air Emission Limitations for Unspecified Sources of Volatile Organic Compounds (310 CMR 7.18(17)) Alternative MOM-2.	Relevant and Appropriate	Unspecified source with the potential to emit 100 tons/year of VOCs must install "Reasonably Available Control Technology" (RACT).	These requirements are relevant and appropriate for the Wildwood vapor collection system and are being complied with.
State Regulatory Requirements	Hazardous Waste Management Requirements (310 CMR 30.00). Alternatives SC-10 and MOM-2.	Relevant and Appropriate	These regulations provide comprehensive monitoring, storing, recordkeeping, etc. programs at hazardous waste sites.	The requirements remain relevant and appropriate since the Source Area (OU-1) treatment system continues to generate RCRA regulated wastes.

TABLE A7-3. ACTION-SPECIFIC ARARS WELLS G&H SITE - OU-1				
SITE FEATURES	**REQUIREMENTS**	**ORIGINAL STATUS**	**REQUIREMENT SYNOPSIS AND APPLICATION FOR THE RI/FS**	**THIRD FIVE-YEAR REVIEW**
State Regulatory Requirements	Hazardous Waste Incinerator Air Emission Requirements 310 CMR 7.08(4). Alternative SC-10.	Relevant and Appropriate	Provides air emission requirements for hazardous waste incinerators. Principal Organic Hazardous Constituents (POHCS) destroyed to 99.99 percent, PCBs to 99.9999 percent. Particulate, HCL and CO emissions also controlled.	The ESD eliminated on-site incineration component required by the ROD in favor of off-site incineration and disposal of soil from Wildwood, NEP and Olympia. Therefore, these requirements are no longer relevant.
State Regulatory Requirements	Ambient Air Quality Standards for the Commonwealth of Massachusetts (310 CMR 6.00). Alternatives SC-10 and MOM-2.	Applicable	This regulation specifies dust, odor, and noise emissions from construction activities.	These requirements remain applicable and have been complied with. Contaminated soils at UniFirst may still result in emissions that would need to be conducted consistent with these requirements.
State Regulatory Requirements	Air Pollution Controls (310 CMR 7.00). Alternatives SC-10 and MOM-2.	Applicable	Regulates new sources of air pollution to prevent air quality degradation. Requires the use of "Best Available Control Technology" (BACT) on all new sources.	These requirements are applicable for the Wildwood vapor collection system and are being complied with.
State Regulatory Requirements	Employee and Community Right-to-Know Requirements (310 CMR 33). Alternatives SC-10 and MOM-2.	Applicable	Establishes rules for the dissemination of information related to toxic and hazardous substances to the public.	These requirements remain applicable and have been complied with.

TABLE A7-3. ACTION-SPECIFIC ARARS WELLS G&H SITE - OU-1				
SITE FEATURES	**REQUIREMENTS**	**ORIGINAL STATUS**	**REQUIREMENT SYNOPSIS AND APPLICATION FOR THE RI/FS**	**THIRD FIVE-YEAR REVIEW**
Federal Regulatory Requirements	CWA National Pollutant Discharge Elimination System (NPDES) (40 CFR 122 125). Alternatives MOM-2.	Applicable	Provides permitting process for surface water body point source discharges.	At UniFirst, treated water is discharged to the Aberjona River. Compliance monitoring is conducted monthly. At Grace, treated water is discharged to Snyder Creek. Compliance monitoring is conducted monthly. At Wildwood, treated water is discharged to the sanitary sewer. Compliance monitoring is conducted monthly. These requirements remain applicable and are being complied with but limits established may be revisited.

APPENDIX

COMMENTS RECEIVED FROM SUPPORT AGENCIES AND/OR THE COMMUNITY