

Five-Year Review Report

Third Five-Year Review Report
for the
PSC Resources Superfund Site
Palmer, Massachusetts

September 2010

Prepared by the
United States Environmental Protection Agency
Region 1, New England
Boston, Massachusetts



Approved by:

Date:

A handwritten signature in black ink, appearing to read "James T. Owens, III", written over a horizontal line.

A handwritten date "9/22/10" in black ink, written over a horizontal line.

James T. Owens, III Director
Office of Site Remediation and Restoration
U.S. EPA, New England

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LIST OF ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
BEHP	Bis(2-Ethylhexyl)phthalate
BSDD	Building/Structures Demolition and Decontamination
CAMU	Corrective Action Management Unit
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EMWP	Environmental Monitoring and Work Plan
EPA	United States Environmental Protection Agency
CFR	Code of Federal Regulations
DEQE	Massachusetts Department of Environmental Quality Engineering
ESD	Explanation of Significant Difference
MassDEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PAH	Polyaromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
POP	Project Operations Plan
PSD	Performing Settling Defendant
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SDWA	Safe Drinking Water Act

VOC

Volatile Organic Compound

EXECUTIVE SUMMARY

The remedy for the PSC Resources Superfund site in Palmer, Massachusetts included stabilization and capping of contaminated soils and sediments on site, institutional controls, and monitored natural attenuation of contaminated groundwater. The remedy was constructed in accordance with the requirements of the 1992 Record of Decision (ROD). One Explanation of Significant Difference (ESD) was issued in 1996 to change the cap design and the treatment approach of soils and sediments. The site achieved construction completion with the signing of the Preliminary Close Out Report on August 28, 1998. The trigger for this third five-year review was the signature date of the last five-year review completed in September 2005.

The remedy is currently protective of human health and the environment because the construction of the remedy is complete, institutional controls are in place and operation and maintenance and monitoring of the remedy is being performed. In order to confirm that the remedy will be protective in the long-term, follow-up actions need to be taken, including performing additional vapor intrusion screening utilizing a lower detection limit for vinyl chloride and adding 1,4-dioxane to the monitoring program.

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FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site name (from WasteLAN): PSC Resources Superfund Site		
EPA ID (from WasteLAN): MAD98073143		
Region: 1	State: MA	City/County: Palmers/ Hampden
SITE STATUS		
NPL status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation status (choose all that apply):		
<input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs?* <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Construction completion date: 8/28/1998
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
Lead agency: <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency		
Author name: Kimberly White		
Author title: Remedial Project Manager		Author affiliation: U.S. EPA, Region 1
Review period:** 2/10/2010 to 9/10/2010		
Date(s) of site inspection: 6/22/2009 & 5/18/2010		
Type of review:		
<input checked="" type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only		
<input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion		
Review number: <input type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input checked="" type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify):		
Triggering action:		
<input type="checkbox"/> Actual RA On-site Construction at OU #		
<input type="checkbox"/> Actual RA Start at OU#		
<input type="checkbox"/> Construction Completion		
<input checked="" type="checkbox"/> Previous Five-Year Review Report		
<input type="checkbox"/> Other (specify):		
Triggering action date (from WasteLAN): 9/30/2005		
Due date (five years after triggering action date): 9/30/2010		

Issues:

1. Groundwater detection limits for vinyl chloride are not low enough to fully evaluate the vapor intrusion exposure pathway. However, based on existing groundwater information vapor intrusion is not a current pathway of concern.
2. There is potential that 1,4-dioxane, a contaminant not previously assessed, may be present at the Site.

Recommendations and Follow-up Actions:

1. Analytical methods for vinyl chloride should be modified so that the detection limit is below the Region 1 1×10^{-6} groundwater screening concentration (0.145 ug/L). The vapor intrusion exposure pathway should be reassessed prior to the next five year review, as necessary.
2. Monitor 1,4-dioxane in groundwater to ensure that any levels detected do not pose unacceptable risks.

Protectiveness Statement(s):

The remedy is currently protective of human health and the environment because the construction of the remedy is complete, institutional controls are in place and operation and maintenance and monitoring of the remedy is being performed.

Long-Term Protectiveness:

In order to confirm that the remedy will be protective in the long-term, follow-up actions need to be taken, including performing additional vapor intrusion screening utilizing a lower detection limit for vinyl chloride and adding 1,4-dioxane to the monitoring program.

Other Comments:

During the five-year review interviews, local officials and businesses in the area expressed concern regarding runoff from the site. The concerns were regarding the impacts to the site's surrounding property following major rain events. Based on site inspections and groundwater data provided by the PSDs, there have been no impacts. EPA will follow-up with each concerned party directly and provide access to the reports submitted by the PSDs through the EPA website and/or public repository.

There has been evidence of small animal burrows on the cap, but this issue has been addressed on an on-going basis. O'Brien & Gere, the PSDs contractors, monitors the cap periodically and makes repairs to any observed burrows. Additionally, when burrows are observed, professional animal trappers are retained to remove the animals from the fenced area.

Toxicity values for 1, 1-dichloroethane (1, 1- DCA) has changed based on risk information so that the risks is greater than initially calculated. This toxicity change (as explained in the technical assessment portion of this report) does not impact the current protectiveness and is unlikely to impact the future protectiveness given the decreasing concentration trends. The groundwater concentrations for 1,1- DCA will continue to be monitored.

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**PSC Resources Superfund Site
Palmer, Massachusetts**

THIRD FIVE-YEAR REVIEW REPORT

I. INTRODUCTION

EPA New England Region has conducted a third five-year review of the remedial actions implemented at the PSC Resources Superfund Site in Palmer, Massachusetts. This review was conducted from February 2010 through September 2010. This report documents the results of the review. The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify deficiencies found during the review, if any, and identify recommendations to address them.

This review is required by statute. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA 121, as amended, 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.

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 PSC Resources Site. The initial triggering action for this five-year review is the five-year review completed in September 2005. Five-year reviews are required for the site since hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unrestricted use and unlimited exposure.

II. SITE CHRONOLOGY

Table–1 - Chronology of Site Events

Date	Event
January 1978	Massachusetts Department of Environmental Quality Engineering (DEQE), now MA Department of Environmental Protection or MassDEP, initiates actions against facility owners resulting in closing of facility.
1982 - 1984	Removal Activities - removing drums, liquids and sludge from tanks.
September 1983	Final listing on EPA National Priorities List.
1986	Additional removal activities - Demolition and removal of remaining storage tanks and waste material contained in tanks.
January 1992	Remedial Investigation/Feasibility Study (RI/FS) made available to public.
March 1992	Proposed Plan identifying EPA's preferred remedy, presented to public. Start of public comment period.
September 1992	Record of Decision (ROD) choosing the remedy is signed.
February 1995	Consent Decree finalizing settlement for Responsible Party performance of remedy, entered by Federal Court.
September 1995	Start of on-site construction for building/structures demolition and decontamination (BSDD) activities (1 st phase of site Remedial Action).
December 1995	1 st phase of Remedial Action completed
November 1996	Explanation of Significant Differences (ESD) issued by EPA, primarily changing a component of the remedy from "in-situ" to "ex-situ".
May 1997	Start of on-site construction for stabilization remedy (2 nd phase of site Remedial Action); contract for work issued in March 1997
September 1997	Completion of stabilization activities. Start of cap construction and wetland restoration activities
November 1997	2 nd Phase of Remediation Action completed
August 1998	Construction Completion and Close Out Report issued.
September 1998	Start of Operation and Maintenance phase
September 2000	First Five-Year Review completed

Table–1 - Chronology of Site Events (Cont'd)

Date	Event
October 2002	A “Non-Material Modification” to the Consent Decree was signed to document additional wetland restoration or enhancement areas and their associated performance standards.
June 2004	Achieved cleanup levels for: (i) Quaboag River and wetland surface water samples (ii) VOC & BEHP in river sediments and (iii) total PAHs, total PCBs, arsenic, and lead in wetland sediments
May 2005	Discontinued Monitoring activities for: (i) Quaboag River sediments at RSED-05 and (ii) wetland sediment samples at WL-SED-02 and -03
September 2005	Second Five-Year Review completed
May 2006	Wetland Sediment sampling discontinued at WL-SED-01
June 2007	Achieved cleanup levels for Quaboag River sediments at all sample locations
June 2008	Wetland Sediment sampling discontinued at WL-SED-04 and groundwater monitoring wells MW-102B, MW-103C and MW-104C
September 2010	Third Five-Year Review

III. BACKGROUND

Physical Characteristics and Land and Resource Use

The PSC Resources Superfund Site (the site) is an approximately four acre property located on Water Street in Palmer, Massachusetts. Palmer is a community of approximately 12,000 residents and is located in Hampden County, in the south central portion of the state. The property is bordered to the west by an athletic field (soccer field); to the east by mixed woods and wetlands; to the north by residential/commercial properties; and to the south by the Quaboag River which flows from east to west. The site is located within the 100-year flood zone and surface and ground water flows south towards the Quaboag River. The underlying groundwater is not considered a drinking water source area and the closest private well is one half-mile to the north/ northwest of the site.

The site includes a fenced in area, located at 10 Water Street, along with the surrounding wetlands and wooded areas that extends westerly to the Quaboag River. The property boundary is shown on Figure 1, Site Plan. The fenced in area is a vegetated mound of unoccupied land, which contains the treated, stabilized soils and sediments from remediation activities under an impermeable cap. A Mobil Oil Co.

pipeline right-of-way runs along a corridor to the south of the site. The remaining areas of the site are unoccupied forested and/or wetland areas that, on occasion have been used by local residents for recreational activities. According to the Town of Palmer Planning Board, properties along Water Street are currently zoned for either residential or industrial use. Although there have been a number of zoning changes over the years, it is anticipated that a mix of land uses similar to that described will continue into the future. In establishing cleanup requirements for the site, EPA considered the theoretical possibility of residential development at the site.

History of Contamination

The property was owned by various oil companies from 1898 to 1974. In 1974, PSC Resources, Inc purchased the property to operate a waste oil and solvent recovery facility. From at least 1974 until operations ceased in 1978 activities at the site included waste oil and solvent recovery and disposal. These operations resulted in spills contaminating soils, sediments and groundwater. Contamination at the site was discovered over the course of several property inspections conducted by the Massachusetts Department of Environmental Quality Engineering (DEQE), now the Massachusetts Department of Environmental Protection (MassDEP), which documented improper maintenance as well as waste oil and hazardous materials spills. In 1978, MassDEP initiated enforcement actions against the owners resulting in a closing of the facility and the requirement to remove approximately 1.5 million gallons of waste materials stored on the property.

Initial Response Actions

Initial removal activities were conducted by private firms; by mid-1980, an estimated one quarter to one million gallons of waste material had been reportedly removed from the property. As a result of the limited progress made in cleanup and removal of wastes, the state requested assistance from the federal government through the Superfund Program and in 1983 the site was included on the National Priorities List (NPL). At that time, an estimated 500,000 gallons of waste materials remained on the property. In 1986, interim measures were taken to establish complete fencing of the site, demolish and dispose of 19 storage tanks, dispose of the oil and water contained in the tanks, and dispose of sludge generated during the cleaning of tanks.

Basis for Taking Action

Between 1988 and 1992, the Remedial Investigation and Feasibility Study (RI/FS) were conducted for the site. It was determined that the hazardous substances which have been released at the site in the following media include:

Soil

- Polychlorinated Biphenyls (PCBs)
- Polynuclear Aromatic Hydrocarbons (PAHs)
- 1,1-Dichloroethane
- Cis-1,2-Dichloroethylene
- Trans-1,2-Dichloroethylene
- 1,1,1-Trichloroethane
- Trichloroethylene (TCE)
- Tetrachloroethylene
- Benzene
- Lead

Lagoon Sediment

- Bis(2-ethylhexyl)phthalate
- PAHs
- 1,1-Dichloroethane
- 1,1,1-Trichloroethane
- Trichloroethylene
- Tetrachloroethylene
- Methylene Chloride
- Benzene
- Acetone
- Lead

Wetland Sediment

- PCBs
- PAHs
- Arsenic
- Lead
- Zinc

Groundwater

- Bis(2-ethylhexyl)phthalate
- Vinyl Chloride
- 1,1-Dichloroethane
- Cis-1,2-Dichloroethylene
- Trans-1,2-Dichloroethylene
- 1,1,1-Trichloroethane
- Methylene Chloride
- Trichloroethylene
- Tetrachloroethylene
- Benzene
- 2-Butanone (MEK)
- Acetone
- Lead

IV. REMEDIAL ACTIONS

A. *Remedy Selection*

The Record of Decision (ROD) for the PSC Resources site was signed on September 15, 1992. Remedial Action Objectives (RAOs) were developed as a result of data collected during the Remedial Investigation to aid in the development and screening of remedial alternatives to be considered for the Record of Decision. The RAOs for PSC Resources were:

Source Control Response Objectives

- Minimize the migration of contaminants from the property soils and lagoon sediment that could degrade ground water quality;
- Reduce risks to human health by preventing direct contact with, and ingestion of, contaminants in the property soils, wetland sediments, and lagoon sediments; and potential ingestion of contaminated ground water;
- Reduce risks to the environment by preventing direct contact with, and ingestion of, contaminants in the wetland sediments;

- Minimize the migration of contaminants (i.e., from property soils, lagoon sediments, and wetland sediments) that could result in surface water concentrations in excess of Ambient Water Quality Criteria.

Management of Migration Response Objectives

- Eliminate or minimize the threat posed to human health and the environment by preventing exposure to ground water contaminants;
- Prevent further migration of ground water contamination beyond its current extent; and
- Restore contaminated ground water to Federal and State applicable or relevant and appropriate requirements (ARARs), including drinking water standards, and to a level that is protective of human health and the environment within a reasonable period of time.

The major components of the source control remedy selected in the ROD include:

1. Decontamination, demolition, and off-site disposal of property structures;
2. Treatment and discharge of lagoon surface water;
3. Consolidation of contaminated property soils with lagoon and wetland sediments on site property;
4. In-situ mixing and stabilization of property soils/sediments with treatment agents to bind contaminants into a stable matrix;
5. Construction of a permeable cap over stabilized property soils and sediments, and grading and planting of the cap's surface;
6. Restoration of wetlands;
7. Implementation of institutional controls on groundwater use and land development; and
8. Long-term monitoring of groundwater, wetland sediments, and Quaboag River water and sediments.

The major components of the management of migration remedy selected in the ROD include:

1. Use of natural attenuation to achieve groundwater cleanup levels;
2. Groundwater monitoring of existing wells on the PSC Resources, Inc. property and of monitoring wells adjacent to the property;
3. Sediment sampling of portions of the wetland and the Quaboag River, where groundwater discharges to the wetland and the Quaboag River;
4. Surface water sampling in areas adjacent to the wetland and in the Quaboag River; and

5. Five-year site reviews to assess site conditions, contaminant distributions, and any associated site hazards.

An Explanation of Significant Differences (ESD) was issued on November 26, 1996. The primary changes documented in the ESD were:

- Ex-situ stabilization instead of in-situ; and
- Construction of a low-permeability cap instead of a permeable cap.

The change to ex-situ stabilization led to the necessity of designating a Corrective Action Management Unit (CAMU) at the site concurrent with the ESD. This designation allowed the handling and temporary storage of contaminated soils and sediments which was necessary using ex-situ stabilization.

B. Remedy Implementation

In the Consent Decree (CD) signed with EPA on September 18, 1994, the Performing Settling Defendants (PSDs) agreed to perform the remedial design/remedial action (RD/RA). The RD was conducted in conformance with the ROD as modified by the ESD. The RD was approved by EPA on March 5, 1997.

The Remedial Action (RA) took place in two phases. The first phase entailed the decontamination, demolition and off-site disposal of property structures. The activities for this phase were initiated on September 12, 1995 and were completed on December 28, 1995. The major components of this phase of the RA were:

- Decontamination of the buildings and structures on the property;
- Removal, treatment, and discharge to the Quaboag River of water from the basement of one building and water collected from decontamination.
- Collection and analyses of composite samples of buildings and structures.
- Demolition and off-site disposal of property buildings and structures and off-site disposal of miscellaneous debris from the property;
- Removal and off-site disposal of two underground storage tanks and one manhole and their contents; and
- Restoration of demolition areas to match existing grade.

The second phase entailed all other remedial activities. Component numbers 2 through 7 of the Source Control Remedy as listed in Section A, constituted the primary activities performed as the second phase of the RA. The activities for the second phase of the RA were formally initiated on March 11, 1997 when the PSDs awarded the RA contract. The contractor conducted remedial activities as planned and EPA and the State conducted a pre-final inspection on November 19, 1997. During this period, 1,606 cubic yards of lagoon sediment, 1,187 cubic yards of wetland sediment and 8,004 cubic yards of soil were treated, stabilized and placed under the impermeable cap. In addition, a fence and surface water drainage structures were built. At this time, the preparation for the wetland restoration (grading and backfilling of clean sediment material) and the planting of new, replacement wetland species was accomplished. The pre-final inspection concluded that construction had been completed in accordance with the remedial design plans and specifications and did not result in the development of a punch list. The site achieved construction completion status on August 28, 1998 when the *Final Remedial Construction Source Control Close-out Report* was submitted by the PSDs contractor, O'Brien & Gere Engineers, Inc, (O'Brien & Gere) and approved by EPA and MassDEP. EPA and the state determined that all RA construction activities, including the implementation of institutional controls, were performed according to specifications. The Interim RA Report documenting the completion of Remedial Action was issued on March 8, 1999.

Following the completion of the soil treatment operations and the construction of the landfill cap, the remaining activities included O&M and monitoring activities, as described below.

C. Operation and Maintenance

The PSDs contractor, O'Brien & Gere, are conducting long term monitoring and maintenance activities according to the operation and maintenance (O&M) plan which was approved by EPA September 8, 1998 and modified in 2001 and then modified yearly from 2004 thru 2009. Modifications to the monitoring requirements were approved based on evaluations conducted by O'Brien & Gere which provided technical rationale and documentation for reducing the type of parameters that had to be analyzed. As discussed in the Data Review portion of Section VI, Five Year Review Process, modifications were based on the conclusion that certain contaminants of concern had achieved clean-up levels for consecutive years and could be removed from subsequent monitoring events.

The primary activities associated with O&M include inspections, environmental monitoring and wetland inspection and assessments as described below.

Inspections

- Visual inspection of the cap with regard to vegetative cover, settlement, stability, and any need for corrective action. In addition, the cap is scheduled to be mowed semi-annually.
- Inspection of the drainage swale for blockage, erosion and instability, and any need for corrective action.
- Inspection of the condition of groundwater monitoring wells.

Environmental monitoring

Groundwater, wetland surface water and sediment, and Quaboag River surface water and sediment were initially monitored quarterly. This was followed by 3 years of semi-annual monitoring, then starting in June 2003, annual monitoring. Annual monitoring is expected to continue at least through 2011, as proposed in the monitoring plan submitted by the PSDs and approved by EPA in May 2008. Following the 2011 sampling round, additional evaluations will be made to determine the frequency and parameters for the monitoring program based on new information presented in this five year review. Currently, the only media requiring sampling is the site groundwater; a list of the changes to the monitoring activities since 2003 is provided as Appendix B.

Engineered wetlands inspection and assessment.

Inspections were conducted primarily for the purposes of assessing both weed control needs and the survival of plantings. Assessments were performed specifically to determine if the engineered wetlands are meeting the performance standards regarding the survival and density of desired wetland species. Wetland performance standards were achieved in 2005 and are no longer assessed as part of O&M activities.

Wetlands Monitoring

The First Five-Year Review documented an access issue with an adjacent private property on which wetland restoration activities had taken place. The PSD contractor was unable to perform wetland inspection and maintenance activities (weeding and re-planting, as necessary) on this property (Figure 2, Site Wetlands) as required in the O&M Plan. The total area of restored wetlands at the site was 0.7 acres. The access issue affected 0.32 acres of restored wetlands. Because these 0.32 acres could not be maintained, it was assumed that target criteria for shrub density and groundcover would not be achieved in this area. Therefore the PSD contractor proceeded to identify alternate areas on the site for restoration or enhancement.

In 2000 and 2001, additional on-site wetland or upland acreage was identified and underwent restoration or enhancement (primarily eradication of invasive species and planting of desirable shrubs and groundcover). The restoration/enhancement

acreage at PSC Resources now totals 0.97 acres. The change in acreage and additional target criteria (performance standards for survival and density of desired species) were documented in a "Non-Material Modification" to the Consent Decree signed on October 29, 2002.

The 0.97 acres is made up of 5 restoration areas, and 5 enhancement areas. As of the September 2005 evaluation (letter report prepared by O'Brien & Gere dated January 3, 2006), wetland restoration areas 1 through 4 and wetland enhancement areas A, B, C and E (as shown in Figure 2), had met their respective target criteria and no longer required monitoring or maintenance. Restoration area 5 and enhancement area D continued to be monitored for invasive weed species through 2006, when performance requirements were achieved. Maintenance and monitoring in the wetland areas are no longer required, as approved by the MassDEP and EPA. There is no impact on the protectiveness of the remedy or the potential release of contaminants from termination of maintenance and monitoring of wetland areas.

V. PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

This section summarizes the protectiveness statements, recommendations and follow-up action since the last review.

Protectiveness Statement from the Last Five-Year Review:

As documented in the First Five-Year Review, the remedy for the PSC Resources site was implemented as required in the ROD, as modified by the ESD. Verification sampling determined that soil and sediment with contamination above cleanup levels had been excavated. Analytical testing showed that the treatment process was effective on the contaminated material (soil and sediment) and that all performance criteria were achieved.

At this time, the assumptions used at the time of remedy selection are valid and no changes to cleanup levels are warranted. Groundwater monitoring shows that natural attenuation is progressing towards achieving cleanup levels. The threats posed by exposure to contaminated soil and sediment at the PSC Resources site have been addressed. Institutional controls have been put in place to ensure that contaminated groundwater is not used and that no actions take place which interfere with the implemented remedy. The remedial action at PSC Resources will be protective when the groundwater cleanup levels are achieved as expected.

Status of Recommendations and Follow-Up Actions from the Last Review

Table 2: Actions Taken Since the Last Five-Year Review

Issues from Previous FYR	Recommendations and Follow-Up Actions	Actions Taken	Date of Action
1. *Restored Wetlands target performance criteria not met for one out of ten areas	Continue maintenance activities	Continued to monitor wetland areas; in 2005 all ten areas met the performance criteria	September 2005
2. Groundwater: Benzene and vinyl chloride cleanup levels not achieved	Continue monitoring activities	Progress of MNA continued to be documented and groundwater cleanup levels were met	June 2009
3. Zinc in Wetland sediment to be evaluated	Continue to monitor for Zinc and assess impacts	**Monitored thru 2007 and zinc was below cleanup levels and was eliminated from the monitoring program	February 2008
4. Lead in Quaboag River sediment to be monitored	Continue monitoring and assess impacts	Monitored thru 2006 and lead concentrations were within an acceptable background concentration range and eliminated from the monitoring program**	June 2007

* Wetland restoration has no impact on the protectiveness of the site, but it was identified as an outstanding issue in the previous Five-Year review for the selected remedy.

** Changes to the annual monitoring program were supported with exception to what is required in support of 5 year review

Since the issuance of the 1992 ROD and 1996 ESD, no changes have been made to the remedy and the site continues in an Operation and Maintenance phase. A summary of the overall progress since the last five-year review, completed in 2005, is listed below.

- Over the years most of the contaminants of concerns at the site have achieved their established performance standards. The PSDs proposed and EPA approved modifications to the monitoring program as compliance was

achieved; as a result, the only media currently monitored at the site is groundwater.

- Groundwater contaminant levels continued to decline. Groundwater monitoring will continue at the site, but the frequency is yet to be determined based on new information presented in this five year review.
- Sediment monitoring for Lead in the Quaboag River and Zinc in the wetlands have been terminated. Conditions in the wetland & Quaboag River sediment to date are considered in compliance.
- The engineered wetlands program has been completed; all ten areas have met their respective performance criteria. Maintenance activities that took place in 2005 and 2006 consisted primarily of control of invasive weeds in wetland #5 and enhancement area D. Maintenance and monitoring has been discontinued in the wetlands area.

VI. FIVE-YEAR REVIEW PROCESS

The Five-Year Review for the PSC Resources site was conducted from February to July 2010 and included the following components:

- Community Notification and Involvement;
- Local Interviews;
- Document Review;
- Site Inspection;
- Monitoring Data Review; and
- Five-Year Review Report Development and Review

Descriptions of these activities are provided below, along with a summary of the findings.

Community Notification and Involvement

A press release was published April 8 in the Journal Register and on April 9, 2010 in The (Springfield) Republican and Palmer Journal. The press release announced the start of the Five Year Review process and provided the contact information to submit comments and/or a request for information. The press release also summarized the site activities and indicated that the results of the review would be made available to the public. A copy of the public notice is included in Appendix E. A second press release will be published in the same publications in October 2010 to provide notification of the availability of this Five-Year Review Report.

Local Interviews

Interviews were conducted with various interested parties including PSDs, MassDEP, town officials, personnel involved in O&M at the site, and a nearby business owner. A copy of the interview responses are provided in Appendix C. In summary, all parties indicated the remedy has been implemented well and maintenance activities have complied with the applicable requirements. Problems with animal burrowing in the cap area were observed by O'Brien & Gere, the PSDs' O&M contractor; they indicated that this issue has been addressed by professional animal trappers, as it occurred. The burrowing does not pose a threat to the integrity of the cap or to the animals, given the geo-membrane and two-feet of cover that prevent exposure of humans and animals to any waste materials. As documented in the O'Brien & Gere, inspection report (O'Brien & Gere 2009b), the most recent animal burrows were observed in September 2008 and June 15, 2009; these burrows were filled with surrounding soil and two groundhogs were removed off-site in June 2009.

As indicated in the interview response from Gary Gill-Austern, representatives of the PSD legal team, and the town conservation commission interview records, trespassing on the site due to recreational activities has been observed in the past, but inspections from local police has since deterred ATV use in the cap and wetland areas. The ATV use on the cap and wetland areas have not caused any significant damage (O'Brien & Gere 2008). EPA and the PSDs will continue to monitor the conditions of the cap during scheduled inspections and address any concerns accordingly.

Local officials and the neighboring business indicated concerns following rain events and requested that additional information be provided to them in the future to alleviate any concerns about contaminants running off the property. Runoff from the site flows directly to the Quabog River and has no impact on the adjacent properties; but in order to address these concerns EPA will follow up directly with the concerned parties and update the EPA website and the existing repository with all reports submitted by the PSDs.

Document Review

The ROD and ESD were reviewed, as well as numerous documents associated with operation and maintenance activities, as listed below. A list of all the documents reviewed is provided as Appendix A.

- *Operations and Maintenance Plan (O&M), Environmental Monitoring and Work Plan (EMWP) and Project Operations Plan (POP)*

The original O&M Plan, EMWP, and POP approved June 1998 has been amended by correspondence dated January 31, 2001 and June 12, 2001, and further amended by letters/memoranda to the EPA and MassDEP dated June 16, 2004, May 26, 2005, May 11, 2006, June 12, 2007, February 20, 2008 and May 21, 2008. A summary of the

changes to the plans since the last five year review are documented on page 2 & 3 of the O'Brien & Gere Summer 2009 Environmental Monitoring Report. The text from this section of the report is provided here as Appendix B.

- *Town of Palmer Planning Board records;*

A review of records at the Town of Palmer Planning Board confirms that the area around the site remains zoned for a mix of industrial and residential uses.

- *Access and Institutional Controls Agreement*

A review of documents filed at the Hampden County Registry of Deeds demonstrates that institutional control documents which restrict activity and usage at the site are in place.

- *Applicable cleanup standards;*

Federal and Massachusetts standards have been examined. Based on evaluations conducted as part of this five-year review, risk-based chemical-specific standards have changed as presented in the Technical Assessment section of the report. The change in the toxicity values does not affect the protectiveness of the remedy.

Site Inspection

Site inspections are conducted periodically by O'Brien & Gere, O&M contractor, in accordance with the Operation and Maintenance Plan, the Environmental Monitoring Work Plan and the Project Operations Plan for the site. Also, as part of this five-year review, an inspection of the wetland restoration areas, Quaboag River, the landfill cap, and site fencing and signage was conducted by EPA in May 2010. A Site Inspection Checklist is provided in Appendix D, along with photos documenting site conditions. A summary of the observations made from these site inspections is presented below regarding the components of the Site Remedy.

- *Landfill Cap*

The cap has been consistently been inspected and mowed on a semi-annual basis. It is well vegetated, stable and generally in good condition. Although animal burrowing has been observed, control methods have been put in place to reduce their activity. ATV use noted during an O'Brien & Gere inspection in June 2008 were not observed during the most recent inspections.

- *Drainage Swale*

The drainage swales around the cap are in good condition; any vegetation in the area is removed during site inspections.

- *Monitoring Wells*

The monitoring wells around the site are visible, secured and in good condition.

- *Wetland Areas*

The wetland restoration and enhancement areas were completed and have met the performance criteria.

- *Site Fences and Signage*

The site fencing and signage are in good condition. The fence is locked and no reports of trespassing have been filed.

Data Review

- *Groundwater monitoring data results*

Monitoring data (see Appendix F) shows that cleanup levels have been achieved for all contaminants of concern, including for the two contaminants (benzene and vinyl chloride), which were identified as exceeding groundwater cleanup levels during the 2005 five-year review. From 2005 to 2007, groundwater samples for Lead, BEHP and VOCs were collected from seven monitoring wells, MW- 101C, MW-102B, MW-103C, MW-104B, MW-104C, MW-105B, and PSC-112S (as shown in Figure 1). The sampling data indicated that Lead and BEHP concentrations in all seven wells had been below the cleanup levels for several years and cleanup levels for VOCs at wells MW-102B, MW-103C and MW-104C had been met and maintained for a minimum of three years. As a result, sample analysis for groundwater Lead and BEHP in all wells was discontinued and monitoring for all parameters at wells MW-102B, MW-103C and MW-104C was also discontinued; further discussion is provided in the letter from O'Brien & Gere to the EPA and MassDEP dated February 20, 2008. From 2008 to 2009 samples were collected for VOCs from the remaining four wells. As of the June 2009 sampling event, VOCs sampled at MW-101C, MW-104B, MW-105B, and PSC-112S steadily decreased and most are below their respective cleanup levels. As presented in Question B of Section 7, toxicity values have changed for certain contaminants, but it is expected that concentrations of these contaminants will continue to attenuate and progress towards the new cleanup level.

- *Wetland sediment monitoring data results;*

As documented in the last five-year review, three of four sampling locations in the remediated wetland areas achieved the performance standards for the sediment COCs, arsenic, lead and zinc between 2003 and 2004. The remaining sample location, EM-WL-SED-04, only exceeded cleanup levels for Zinc, which continued to be sampled yearly until 2007; it has since been eliminated from the monitoring program. This decision was approved by the EPA based on an evaluation conducted O'Brien & Gere. The technical memorandum prepared by O'Brien & Gere, dated February 20, 2008, indicated that this location was initially identified as a background sample location. The memo also stated that the sample location is side-gradient to the site; in an uncontrollable area owned by a third-party; and that the Zinc concentrations were likely from a source unrelated to the site. The wetland sediment data collected to date indicates that locations within the site have achieved performance standards.

- *River surface water and sediment monitoring data results;*

EPA approved termination of monitoring of Quaboag River surface water and sediments are no longer being monitored as of June 2003 and June 2006, respectively. There are no surface water concentrations above site-specific clean-up levels. Sediment sampling, since the last five year review, indicates that the only constituent that had not achieved cleanup levels was Lead. In a June 2006 technical memorandum, O'Brien & Gere assessed the lead data and determined that the concentrations have leveled off and are trending toward a decline. Additionally, the memo indicated that the majority of sampling results had no adverse impacts or only potentially rare adverse impacts to sediment-dwelling organisms.

VII. TECHNICAL ASSESSMENT

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

YES. The review of documents, ARARs (relevant standards), risk assumptions, and the results of the site visit indicate that the remedy is functioning as intended in the ROD, as modified by the ESD.

The active work for the PSC Resources Site Remedial Action, the treatment and capping of contaminated soil and sediment, has been completed. The site is currently in operation and maintenance phase.

Groundwater is being remediated via natural attenuation following removal of contamination sources in soil and sediments. The monitoring record shows that groundwater contamination has not migrated beyond its extent at the time of the ROD. The monitoring record indicates that the groundwater attenuation process conceptualized in the ROD is proceeding as expected. Groundwater concentrations for contaminants of concern have steadily decreased and most are below their respective cleanup levels. As presented in Question B below, toxicity values have changed for certain contaminants, but it is expected that concentrations of these contaminants will continue to attenuate and progress towards the new cleanup level. Benzene and vinyl chloride, which were above cleanup levels during the last five year review completed in 2005, were also observed to be below cleanup levels. A copy of the groundwater monitoring data is included in this report as Appendix G.

Restored wetlands have been monitored and maintained as required in the O&M Plan. All ten restoration areas have achieved their required performance criteria and are no longer being inspected.

EPA conducted the most recent inspection of the site in May 2010. No issues were identified at that time. All fences and barriers were intact and in good repair, cap

vegetation and drainage swales were in good condition and restoration/enhancement areas appeared in good condition. Although ATV tire markings were observed along a path going through the Hafner property, no evidence of trespassing or vandalism was noted for the site.

- *Institutional Controls*

Institutional controls are in place for the PSC Resources property as well as for the adjacent Town-owned property, the only properties on or near the site requiring institutional controls. These institutional controls are established through the Access and Institutional Controls Agreement between the Performing Settling Defendants and the Town of Palmer (Appendix J of the Consent Decree), dated October 20, 1994, and recorded on June 19, 1997 in the Hampden County Registry of Deeds at Book 9901, pages 118 through 136. Section 7 of Appendix J identifies the institutional controls which are in place, including prohibitions on the use or disturbance of ground water until cleanup levels are achieved, and prohibitions on excavation activities, disturbance of the cap, and any other activities or actions which might interfere with the implemented remedy. The Town of Palmer is charged with the responsibility of incorporating the restrictions of the agreement into all instruments of transfer (i.e. deeds, easements, etc.). In addition, the EPA intends to incorporate the cap boundaries into the DigSafe® system, which provides notification when parties intend to conduct subsurface activities within this boundary. There has been no evidence found of activity in the last five years which is inconsistent with the institutional controls.

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

NO, there have been changes to the exposure assumptions, toxicity data, and cleanup levels; however these changes do not impact the protectiveness of the remedy.

Changes in Land Use of the Site and Physical Site Conditions

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Although animal burrows have been observed on the cap, there is a geo-membrane and two-feet of cover to prevent exposure of humans and animals to any waste materials.

Based on information provided by the Town of Palmer officials, there are no proposed changes in land use at the site. Institutional controls are in place for the site to assure that changes in the current land use restrict groundwater use and subsurface activities.

New Contaminants and/or Contaminant Sources

Based on existing monitoring data, no new contaminant sources have been identified at the site. Verification sampling determined that soil and sediment with contamination above cleanup levels had been excavated. Analytical testing showed that the treatment process was effective on the contaminated material (soil and sediment) and that all performance criteria were achieved.

- *New contaminant related to 1,1,1-Trichloroethane*

Based on technical assessments completed as part of this Five Year Review, there is potential that 1,4-dioxane, a contaminant not previously assessed, may be present at the Site. 1,4-dioxane is a compound known to be used both as a solvent and as a stabilizer for other chlorinated solvents, especially 1,1,1-trichloroethane, in industrial degreasing operations. 1,4-dioxane has both cancer and non-cancer toxicity values, and the ability to detect low concentrations of 1,4-dioxane has only recently become available.

Groundwater monitoring data between 1995 and 2009 (O'Brien & Gere 2009) show that 1,1,1-trichloroethane was detected at site wells. Since groundwater monitoring data available for review do not include 1,4-dioxane in the analysis, it is unknown whether 1,4-dioxane exists in groundwater at the site or not, and if so, whether the levels would be safe for ingestion or not under the potential future use of the site. It is necessary to monitor 1,4-dioxane in groundwater to ensure that any levels detected do not pose unacceptable risks if the future use of the site allows for groundwater consumption.

- *EPA's Dioxin Reassessment*

EPA's dioxin reassessment has been developed and undergone review over many years with the participation of scientific experts in EPA and other federal agencies, as well as scientific experts in the private sector and academia. The Agency followed current cancer guidelines and incorporated the latest data and physiological/biochemical research into the assessment. The results of the assessment have currently not been finalized and have not been adopted into state or federal standards. EPA anticipates that a final revision to the dioxin toxicity numbers may be released by the end of 2010. In addition, EPA/OSWER has proposed to revise the interim preliminary remediation goals (PRGs) for dioxin and dioxin-like compounds, based on technical assessment of scientific and environmental data. However, EPA has not made any final decisions on interim PRGs at this time. Therefore, the dioxin toxicity reassessment for this Site will be updated during the next Five Year Review.

Changes in Standards or TBCs

ARARs which have been evaluated include the Safe Drinking Water Act (SDWA)(40 CFR 141.11-141.16) from which were derived many of the groundwater cleanup levels - Maximum Contaminant Levels (MCLs), and MCL Goals (MCLGs) and State MCLs (310 CMR 22); (A list of the ARARs is provided as Appendix G.) There have been no changes in these ARARs affecting the protectiveness of the PSC Remedy.

Changes in Exposure Pathways and Exposure Assumptions, Toxicity Values, and Risk Assessment Methods

- *Exposure Assumptions*

The exposure assumptions used to develop the Human Health Risk Assessment included both current exposures (older child trespasser, adult trespasser) and potential future exposures (young and older child future resident, future adult resident and future adult worker). These exposure scenarios are considered to be conservative and reasonable in evaluating risk and developing risk based cleanup levels.

Since the time of the remedy selection, several risk assessment methods have been revised. The risk assessment was conducted prior to the publication of current EPA risk assessment guidance Risk Assessment Guidance for Superfund Volume 1, Human Health Evaluation Manual, Part E (RAGS E) (EPA 2004). RAGS E provides updates for default exposure parameters specific to the dermal pathway. However, a review of site information identifies that these updates do not call into question the protectiveness of the remedy.

- *New Exposure Pathway – Inhalation of VOCs*

The ICs in place for the PSC Resources property include prohibitions on the use or disturbance of groundwater until cleanup levels are achieved. If there is potential for groundwater use in the future the potential exists for risks associated with inhalation of volatile organic compounds in groundwater from domestic water use such as showering, bathing, uses of sinks, toilets, and clothes/dish washers. This pathway was not considered in the original risk assessment, the derivation of the cleanup levels, or in the First or Second FYR.

Of the 11 VOCs for which there are groundwater cleanup levels presented in Table 7 the ROD, 9 are based on the MCLs / MCLGs and 2 are risk-based. The MCLs / MCLGs remain relevant for 9 of the 11 VOCs, however the inhalation pathway for the VOCs with risk-based cleanup levels, acetone and 1,1-dichloroethane, may potentially increase health risks determined in the 1992 ROD and therefore the risk-based cleanup level.

Groundwater data is available from O'Brien & Gere 2009 for both acetone and 1,1-dichloroethane between 1998 and 2009. An evaluation of the inhalation of acetone and 1,1-dichloroethane in groundwater from domestic water use, using standard default exposure assumptions and the maximum detected concentration between 2005 and 2009 (2.23 ug/L for acetone and 67 ug/L for 1,1-dichloroethane) identifies that there is no concern for potential non-cancer health effects from acetone, but there may be concern for potential cancer health effects from inhalation of 1,1-dichloroethane. The risk contribution from this pathway is incorporated in the concentration of 1,1-dichloroethane associated with the 10^{-6} risk as described below.

- *New Exposure Pathway: Vapor Intrusion*

The 1992 ROD and subsequent FYRs did not evaluate the potential for risks associated with vapor intrusion into the indoor air of possible future residential structures. The evaluation conducted as part of this five-year review used the screening values identified in EPA's 2002 Vapor Intrusion Draft Guidance or are Region 1 specific for those contaminants whose screening levels are truncated at the MCL in the 2002 Guidance. The screening values correspond to a cancer risk = 10^{-6} or an HQ = 0.1. A review of site groundwater data collected between 2005 and 2009 (O'Brien & Gere 2009), identifies that concentrations of benzene, PCE and vinyl chloride all exceeded their corresponding groundwater screening value. Additionally, the data indicates that the groundwater detection limit for vinyl chloride has typically been 1 ug/L, but this limit exceeds the Region 1 10^{-6} groundwater screening concentration (0.145 ug/L) and therefore raises the question of whether vinyl chloride may be present in groundwater at concentrations that may be of interest for the vapor intrusion pathway. For future sampling rounds, analytical methods should be modified so that the detection limit is low enough to adequately evaluate data at concentrations down to the groundwater screening concentration.

Overall, the vapor intrusion exposure pathway is unlikely to contribute to human health risks under current conditions based on the distance between the residential structures along Water Street and the known location of contaminated groundwater, and the groundwater flow description provided in the 1992 ROD. The structures along Water Street are all more than 300 feet from the wells with concentrations that exceeded the groundwater screening values for the vapor intrusion pathway based on data provided in O'Brien & Gere 2009. The 1992 ROD identifies that the predominant direction of groundwater flow at the Site is towards the Quaboag River. If the flow direction remains consistent with the ROD description, it is expected that the residential and commercial structures along Water Street are not influenced by contaminated groundwater and therefore the potential for vapor intrusion into indoor air under current site conditions is unlikely. However, if structures are to be built on-site in the near future, and groundwater concentrations remain consistent, the vapor intrusion pathway may cause an increase in adverse health effects. This pathway can be reassessed as needed in future Five Year Reviews based on continued groundwater monitoring data.

- Toxicity Values

The table below summarizes the changes in oral toxicity values for the COCs identified in Table 3-1 of the 1992 RI. The changes summarized in the attached table reflect the information provided in the OSWER's December 2003 Directive 9285.7-53, as well as any updates to the toxicity values themselves. Of primary concern are those toxicity values that have changed so that the calculated risks are greater than initially calculated.

A review of the risk tables included in the RI and the cleanup levels presented in Table 7 of the ROD identifies that the changes to the toxicity values for 1,1-dichloroethane and PAHs would result in an increase in the calculated risk. The cleanup level (3,600 ppb) for 1,1-dichloroethane is based on the non-cancer reference dose because no cancer slope factor was available at the time of the ROD. The current slope factor would result in a lower cleanup levels for groundwater. The concentration associated with a 10^{-6} cancer risk is 2.4 ug/L. 2009 detections of 1,1-dichloroethane in site groundwater monitoring well MW-105B had a maximum concentration of 26.8 ug/L representing a 1.1×10^{-5} cancer risk. Updated risk information for this, and other, site related contaminants will be used to calculate the overall residual site risks once all ROD-specified groundwater cleanup levels are met. At that time, it may be necessary to modify/update the cleanup level for 1,1-dichloroethane and/or other contaminants.

The cleanup level (100 ppm) for carcinogenic PAHs is based on a cancer slope factor of $1.15E+01 \text{ (mg/kg-d)}^{-1}$. There have been two significant updates to the methodology for evaluating PAHs since the 1992 ROD: 1) an estimated order of potential potency for potentially carcinogenic PAHs is used to determine cancer slope factors for individual PAHs relative to benzo(a)pyrene, and 2) an age dependent adjustment factor is applied to PAHs due to the mutagenic mode of action. These updates may potentially increase the cancer risk associated with PAHs and would lower the cleanup levels for lagoon sediments. The concentration of benzo(a)pyrene (the most toxic of the carcinogenic PAHs) that is associated with a 10^{-4} risk is 15.7 mg/kg when applying the ADAFs and the exposure assumptions from the 1992 ROD. The cleanup level identified in Table 7 of the ROD is 100 mg/kg (based on 10^{-4} risk). However the concentrations of individual PAHs in the lagoon sediment confirmatory samples, included in the Remedial Action Report for PSC Resources dated March 8, 1999, are all non detect with a detection limit of 13 mg/kg at LS-01 and LS-03 and a detection limit of 10 mg/kg at LS-02. Therefore, while there have been updates to the risk assessment methodology, it does not appear that current concentrations of PAHs in lagoon sediments would cause an unacceptable risk outside of EPA's risk range.

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Oral Toxicity Values

Contaminant	1992 ROD Ingestion Cancer Potency Factor (mg/kg-d) ⁻¹	Source	2010 FYR Oral Slope Factor (mg/kg-d) ⁻¹	Source	1992 ROD Chronic Ingestion Reference Dose (mg/kg-d)	Source	2010 FYR Chronic Ingestion Reference Dose (mg/kg-d)	Source
TEDF ¹	1.50E+05	HEAST	1.50E+05	HEAST	-	-	1.00E-09	ATSDR
Total PCBs ²	7.70E+00	IRIS	2.00E+00	IRIS	-	-	-	-
Bis(2-ethylhexyl)phthalate	1.40E-02	IRIS	1.40E-02	IRIS	2.00E-02	IRIS	2.00E-02	IRIS
Di-n-butyl phthalate	-	-	-	-	1.00E-01	IRIS	1.00E-01	IRIS
Total cPAHs ³	1.15E+01	SPHEM	7.30E+00	IRIS	4.00E-03	*	-	-
Total ncPAHs ³	-	-	-	-	4.00E-03	HEAST	4.00E-03	IRIS
Vinyl Chloride	1.90E+00	HEAST	7.20E-01	IRIS	-	-	3.00E-03	IRIS
1,1-Dichloroethane	-	-	5.70E-03	CalEPA	1.00E-01	HEAST	2.00E-01	PPRTV
1,2-Dichloroethylenes ⁴	-	-	-	-	2.00E-02	IRIS	2.00E-02	IRIS
Methylene Chloride	7.50E-03	IRIS	7.50E-03	IRIS	6.00E-02	IRIS	6.00E-02	IRIS
1,1,1-Trichloroethane	-	-	-	-	9.00E-02	IRIS	2.00E+00	IRIS
Trichloroethylene	1.10E-02	HEAST	5.90E-03	CalEPA	-	-	-	-
Tetrachloroethylene	5.10E-02	HEAST	5.40E-01	CalEPA	1.00E-02	IRIS	1.00E-02	IRIS
2-Butanone	-	-	-	-	5.00E-02	IRIS	6.00E-01	IRIS
Acetone	-	-	-	-	1.00E-01	IRIS	9.00E-01	IRIS
Benzene	2.90E-02	IRIS	5.50E-02	IRIS	-	-	4.00E-03	IRIS
Ethylbenzene	-	-	1.10E-02	CalEPA	1.00E-01	IRIS	1.00E-01	IRIS
Toluene	-	-	-	-	2.00E-01	IRIS	8.00E-02	IRIS
Xylenes	-	-	-	-	2.00E+00	IRIS	2.00E-01	IRIS
Arsenic	1.75E+00	IRIS	1.50E+00	IRIS	1.00E-03	HEAST	3.00E-04	IRIS
Lead	-	-	-	-	1.50E-03	MCL	-	-

1 - The toxicity values for TEDF correspond to those of 2,3,7,8-TCDD

2 - The current slope factor for Total PCBs corresponds to the IRIS value for high risk PCBs.

3 - The cancer SF for Total PAHs corresponds to the value of benzo(a)pyrene, the most toxic of the carcinogenic PAHs. The non-cancer RfD for Total PAHs corresponds to the value of naphthalene.

4 - The toxicity values for 1,2-Dichloroethylene correspond to those of the trans isomer.

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

NO. No information has come to light that could call into question the protectiveness of the remedy. Site inspection and monitoring results indicate that the remedy is protective.

Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD, as modified by the ESD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Institutional controls are in place to restrict activity and groundwater usage at the site.

VIII. ISSUES

Table 3: Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Groundwater detection limits for vinyl chloride are not low enough to fully evaluate the vapor intrusion exposure pathway. However, based on existing groundwater information vapor intrusion is not a current pathway of concern.	N	Y*
There is potential that 1,4-dioxane, a contaminant not previously assessed, may be present at the Site.	N	Y*

* These issues may affect future protectiveness depending on the outcome of further evaluation.

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Table 4: Recommendations and Follow-up Actions

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Groundwater detection limits for vinyl chloride are not low enough to fully evaluate the vapor intrusion exposure pathway. However, based on existing groundwater information vapor intrusion is not a current pathway of concern.	Analytical methods for Vinyl Chloride should be modified so that the detection limit is below the Region 1 10^{-6} groundwater screening concentration (0.145 ug/L). Conduct Vapor Intrusion screening prior to the next Five Year Review, as necessary.	PSDs EPA	EPA	September 2012	N	Y*
There is potential that 1,4-dioxane, a contaminant not previously assessed may be present at the Site.	Monitor 1,4-dioxane in groundwater to ensure that any levels detected do not pose unacceptable risks.	PSDs	EPA	September 2014	N	Y*

* These issues may affect future protectiveness depending on the outcome of further evaluation.

X. PROTECTIVENESS STATEMENT

The remedy is currently protective of human health and the environment because the construction of the remedy is complete, institutional controls are in place and operation and maintenance and monitoring of the remedy is being performed. In order to confirm that the remedy will be protective in the long-term, follow-up actions need to be taken, including performing additional vapor intrusion screening utilizing a lower detection limit for vinyl chloride and adding 1,4-dioxane to the monitoring program.

XI. NEXT REVIEW

Five-year reviews are conducted every five years at sites where contaminant levels remain at concentrations that prevent unlimited, unrestricted use of the site. The next five-year review for the PSC Resources Superfund Site should be conducted by 2015.

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Figures

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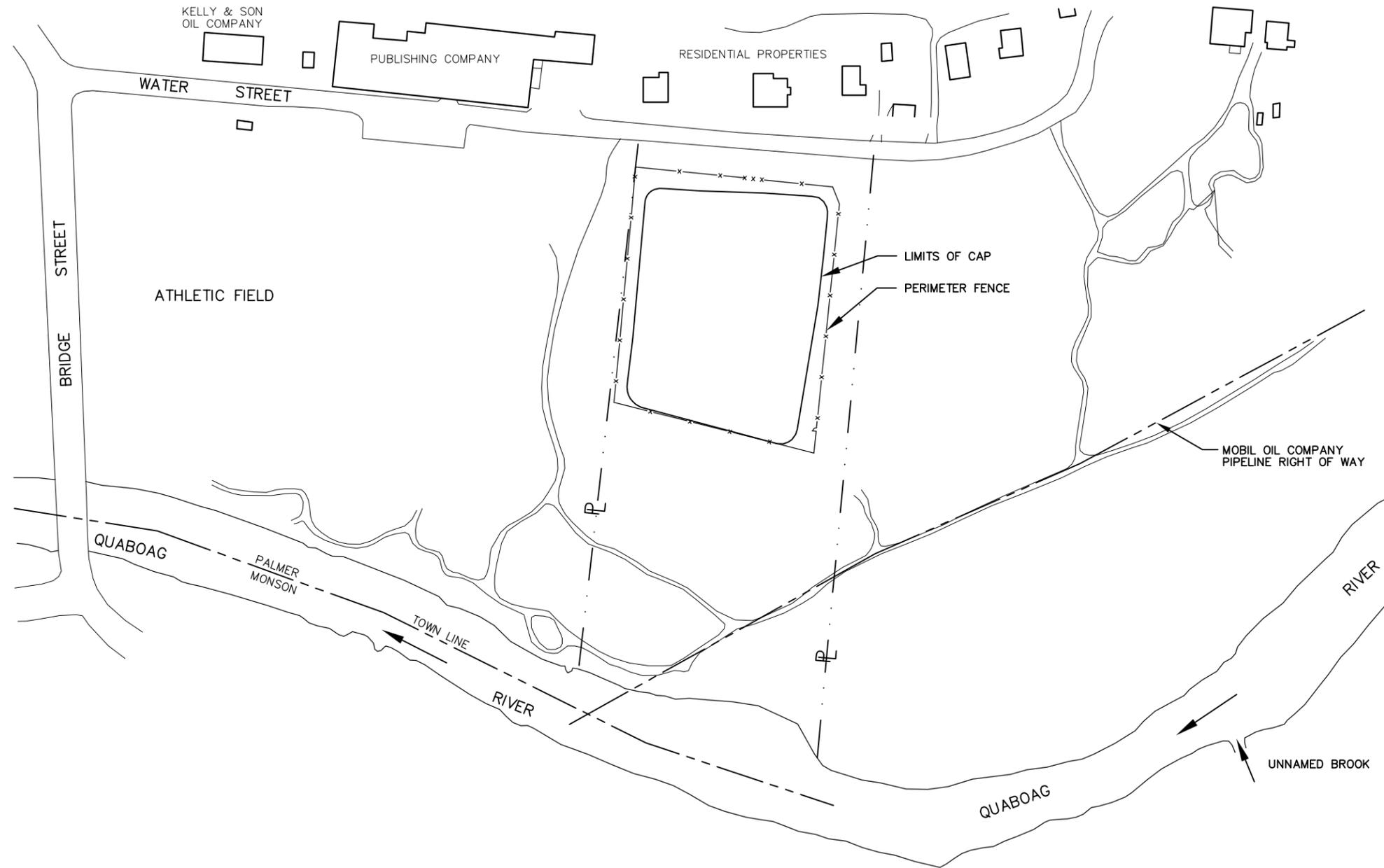
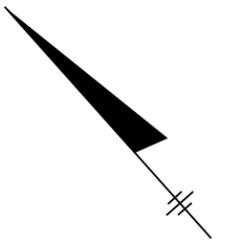


FIGURE 1



LEGEND

- x — APPROX. FENCELINE LOCATION
- P — PSC RESOURCES PROPERTY BOUNDARY

NOTE:
ELEVATIONS RELATIVE TO
MEAN SEA LEVEL

PSC RESOURCES
SUPERFUND SITE
PALMER, MASSACHUSETTS

SITE PLAN



GENERAL NOTES:

1. FIGURE PLANS AND PRESENTATION MAP'S WERE PREPARED BASED UPON INFORMATION WITHIN THE "SARSS II" REMEDIAL INVESTIGATION, VOLUME I OF IV, SECTIONS 1 THROUGH 8, DATED JANUARY 1992, PREPARED BY HMM ASSOCIATES, INC.

REV DATE: 9/17/99

OCTOBER 2004
FILE NO. 5819.005.023

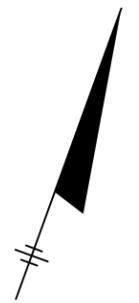


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FIGURE 2

FIGURE NOTES:

1. FIGURE ADAPTED FROM "FINAL SITE PLAN" AS-BUILT DRAWING SHEET G-4 FILE NUMBER 5819.003-045.
2. WETLANDS DEPICTED ON HAFNER PROPERTY NO LONGER SUBJECT TO MAINTENANCE AND EVALUATION.
3. DUE TO THE SMALL SIZE OF RESTORED WETLAND #2, AS CURRENTLY INDICATED ON FIGURE 3-2 OF THE O&M PLAN, AND THE COMMONALITY OF HABITAT AND SPECIES COMPOSITION OF WETLAND #2 AND THE AREA OF THIS PLOT, WHICH IS INDICATED ON FIGURE 3-2 AS A WETLAND TO BE MONITORED/MAINTAINED, THESE TWO AREAS WERE COMBINED TO REPRESENT WETLAND #2.
4. IN ACCORDANCE WITH SECTION V.B.1.q OF THE SOW, MONITORING OF WETLANDS #1, #2, AND #4 WAS DISCONTINUED FOLLOWING THE 2003 EVALUATION.



LEGEND

- OHW — OVERHEAD WIRES
 - - - - - PROPERTY LINE
 - RESTORED WETLANDS TO BE MONITORED/MAINTAINED
 - WETLANDS TO BE MONITORED/MAINTAINED
 - ENHANCEMENT AREA WETLAND BOUNDARY BARRIER
 - ● ● BARRIER
 - · - · - WETLAND BOUNDARIES
- WETLAND TYPES
- EMERGENT
 - SCRUB/SHRUB
 - FORESTED
- UTILITY POLE GUY WIRE
 - SMH ○ SANITARY MANHOLE
 - GATE IN FENCE
 - DMH ○ DRAINAGE MANHOLE
 - UPLAND
 - DELINEATED WETLAND

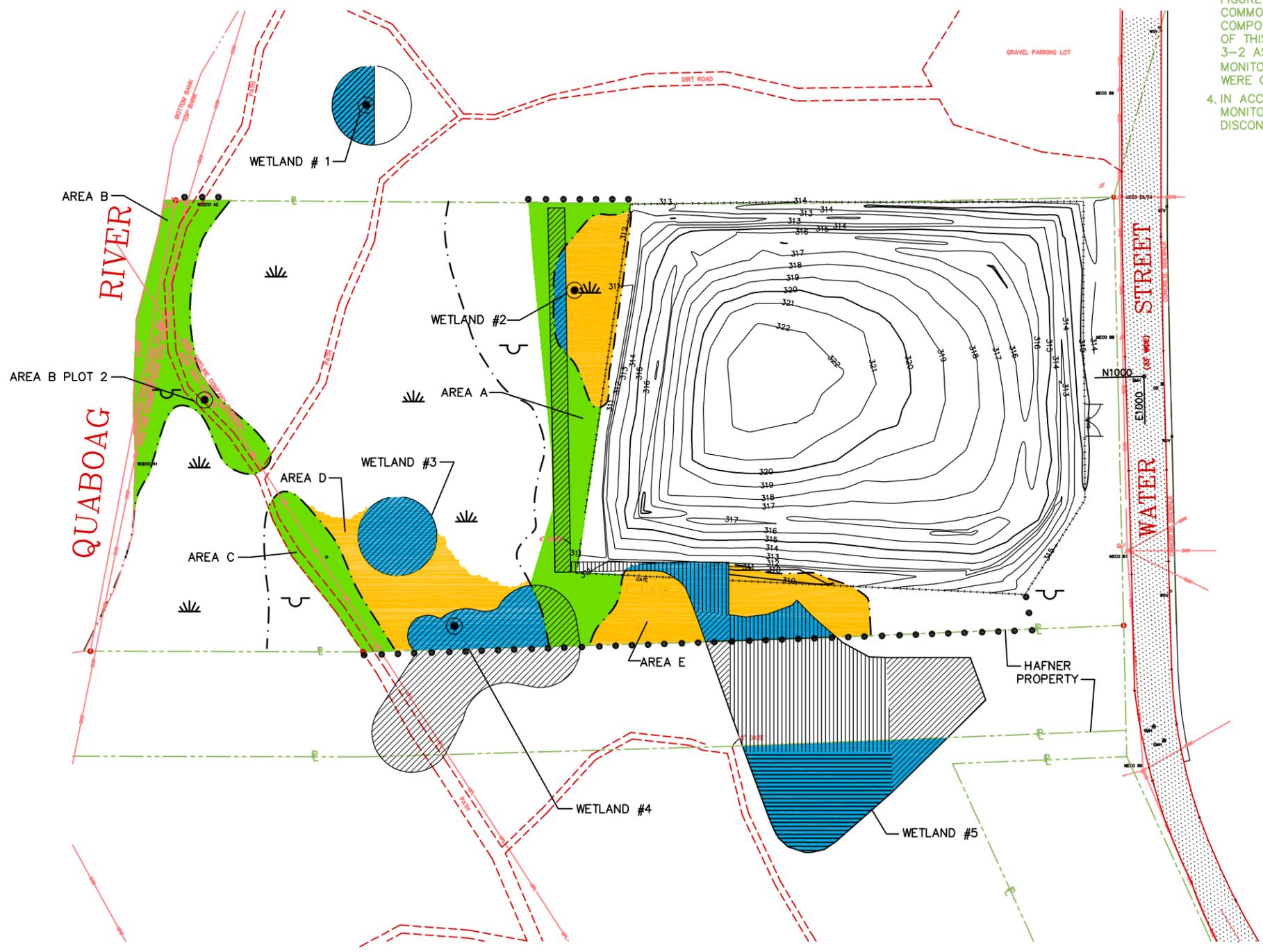
PSC RESOURCES SUPERFUND SITE PALMER, MASSACHUSETTS

SITE WETLANDS



SCALE IN FEET

JANUARY 2005
FILE NO. 5819.005.024



Appendix A

Documents Reviewed/ Referenced

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Documents Reviewed / References

1. EPA 1992a. USEPA. PSC Resources Site, Remedial Investigation. January 1992.
2. EPA 1992b. USEPA, PSC Resources Site, Record of Decision. September 15, 1992
3. EPA 1994. USEPA, PSC Resources Site, Access and Institutional Controls Agreement (Appendix J of the Consent Decree). October 20, 1994
4. EPA 1996. USEPA, PSC Resources Site, Explanation of Significant Difference. November 26, 1996
5. O'Brien & Gere 1998. O'Brien & Gere Engineers, Inc. Final Remedial Construction Source Control Closeout Report. June 1998
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9. EPA 2003. USEPA, OSWER Directive 9285.7-53. Human Health Toxicity Values in Superfund Risk Assessments. December 5, 2003.
10. EPA 2004. USEPA, Risk Assessment Guidance for Superfund (RAGS) Part E: Supplemental Guidance for Dermal Risk Assessment. July 2004.
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12. EPA 2005. USEPA, PSC Resources Site, Second Five Year Review, September 2005
13. O'Brien & Gere 2008. O'Brien & Gere Engineers, Inc. Draft Summer 2008 Environmental Monitoring Report, September 18, 2008
14. O'Brien & Gere 2009. O'Brien & Gere Engineers, Inc. Draft Summer 2009 Environmental Monitoring Report, November 2, 2009. *(letters/memoranda to the EPA & MassDEP dated June 16, 2004, May 26, 2005, May 11, 2006, June 12, 2007, February 20, 2008 and May 21, 2008 are included in the Appendix A of report)*
15. O'Brien & Gere 2009b. O'Brien & Gere Engineers, Inc., PSC Resources Site Inspection Report, August 2009.

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Appendix B

Summary of Changes to Site Monitoring Activities

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Below is the text from pages 2 & 3 of O'Brien & Gere Engineers, Inc. Draft Summer 2009 Environmental Monitoring Report, November 2, 2009, which summarizes changes in the monitoring activities at the Site:

In accordance with the June 16, 2004 letter to the agencies, the following monitoring activities were discontinued following the summer 2003 monitoring event:

- Quaboag River and wetland surface water sampling
- Volatile organic compound (VOC) and Bis(2-ethylhexyl)phthalate (BEHP) sample collection/analyses in river sediment
- Total PAHs, total PCBs, arsenic, and lead sample collection/analyses in wetland sediment.

In accordance with conclusions presented in the Summer 2004 Environmental Monitoring Report and approval from the agencies, as memorialized in the May 26, 2005 letter to the agencies, the following monitoring activities were discontinued following the summer 2004 monitoring event:

- Quaboag River sediment samples at RSED-05
- Wetland sediment samples at locations WL-SED-02 and WL-SED-03.

In accordance with conclusions presented in the Summer 2005 Environmental Monitoring Report and approval from the agencies, as memorialized in the May 11, 2006 letter to the agencies, the following monitoring activities were discontinued following the summer 2005 monitoring event:

- Wetland sediment sample at location WL-SED-01.

In accordance with the June 12, 2007 technical memorandum to the agencies, which contained revisions requested by the agencies in their June 8, 2007 approval by electronic mail of the original technical memorandum dated April 11, 2007, the following monitoring activities were discontinued following the summer 2006 monitoring event:

- Quaboag River sediment samples at RSED-01 and RSED-06.

A February 20, 2008 technical memorandum is included in Appendix A. The memorandum addresses (among other things) a proposed modification to wetland sediment monitoring and ground water monitoring. USEPA's approval of the proposed modification to wetland sediment monitoring

and ground water monitoring is documented in a letter dated June 18, 2008 (included in Appendix A). The following monitoring activity was discontinued following the summer 2007 monitoring event:

- Wetland sediment sample at WL-SED-04.

The following monitoring activities were discontinued following the summer 2008 monitoring event:

- Ground water samples at MW-102B, MW-103C and MW-104C.

Based on the modifications to the EMWP stated above, ground water is the only medium that requires monitoring.

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Appendix C

Interview Notes

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INTERVIEW RECORD

Site Name: PSC Resources		EPA ID No.: MAD 980731483	
Subject: Five-Year Review - Town Conservation Commission		Time: 9:45 am	Date: 6/09/10
Type: <input checked="" type="checkbox"/> Telephone <input checked="" type="checkbox"/> E-mail <input type="checkbox"/> Other <input type="checkbox"/> Visit Location of Visit:		<input checked="" type="checkbox"/> Incoming <input type="checkbox"/> Outgoing	
Contact Made By:			
Name: Kimberly White	Title: RPM	Organization: USEPA	
Individual Contacted:			
Name: David Johnson	Title: Conservation Commission Chairman	Organization: Town of Palmer	
Telephone No: 413-283-2611	Street Address: 4417 Main Street	City, State, Zip: Palmer, MA 01069	
Fax No: 413-283-2637	E-Mail Address: conservation@townofpalmer.com		
Summary of Conversation			
<p>1. What is your overall impression of the project? (general sentiment) Good. Concerned about runoff from site going on to the adjacent playing field. Interested in having water sampled and reviewing recent groundwater data from monitoring well near the field.</p> <p>2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results. Last year, inspected land east of the site due to complaints about ATV use in area. This issue has subsided since, due to the awareness that the area is being monitored.</p> <p>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 responses. No.</p> <p>4. Has there been any interest in developing in and around Site? No.</p> <p>5. Are there any issues or concerns about the site's activities and progress that have not been addressed? No, not related to site, but interested in getting more information about plans for trust fund monies established as a result of the site.</p> <p>6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? No, other than what was indicated in question 1.</p>			

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INTERVIEW RECORD

Site Name: PSC Resources	EPA ID No.: MAD980731483	
Subject: Five Year Review - Interview of local business near site	Time: 2:10 pm	Date: 6/7/10
Type: <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> E-mail <input type="checkbox"/> Other <input type="checkbox"/> Visit Location of Visit:	<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing	

Contact Made By:

Name: Kimberly White	Title: RPM	Organization: USEPA
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Individual Contacted:

Name: Jed Terwilliger	Title: Compliance Officer	Organization: Turley Public
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Telephone No: 800-824-6548	Street Address: 24 Water Street
Fax No: 413-289-1377	City, State, Zip: Palmer, MA 01069

E-Mail Address: jterwilliger@turley.com

Summary of Conversation

- 1. What is your overall impression of the project? (general sentiment)**
Satisfactory. Initial Clean-up was satisfactory and maintenance of the site has been good.
- 2. What effects have site operations had on the surrounding community?**
Initially, when remediation activities were initiated at the site, there was an active interest (excitement) about what was happening. Many of those concerns have since been resolved and/or are no longer present, which has allowed the community to heal.

More recently, there was some concern about the conditions of the site after the flood in 2005. Area businesses were required to report the status of their business activities to the MassDEP and EPA; felt the same courtesy should have been extended to the neighbors regarding the site. A letter should be provided with the status of site conditions after a major flood event.
- 3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.**
As the publisher of the local newspaper, no concerns or letters to the editor regarding the site have been received.
- 4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.**
No.
- 5. Do you feel well informed about the site's activities and progress?**
Yes, able to access the website for PSC Resources; felt satisfied with the information provided.
- 6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?**
None, other than what was indicated in Question 2.

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INTERVIEW RECORD

Site Name: PSC Resources	EPA ID No.: MAD 980731483	
Subject: Five-Year Review	Time: 1140am	Date: 6/7/10
Type: <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> E-mail <input type="checkbox"/> Other <input type="checkbox"/> Visit Location of Visit:	<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing	

Contact Made By:

Name: Kimberly White	Title: RPM	Organization: USEPA
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Individual Contacted:

Name: Linda Leduc	Title: Town Planner	Organization: Town of Palmer
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Telephone No: 413-283-2605	Street Address: 4417 Main Street
Fax No: 413-283-2637	City, State, Zip: Palmer, MA 01069

E-Mail Address: lleduc@townofpalmer.com
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Summary of Conversation

1. What is your overall impression of the project? (general sentiment)
The site is secure and being maintained well.

2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.¶
No

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 responses.
No

4. Has there been any re-zoning of the area where the Site is located?
No

5. Has there been any request to access the Site by any third parties? If so, have there been any issues or concerns with enforcing the institutional controls?
No

6. Are there any issues or concerns about the site's activities and progress that have not been addressed?
There are no issues with the progress of the site itself, but there are significant concerns regarding the landswap that was a requirement of the settlement. It is understood that a parcel of riverfront property has been selected in Palmer to be purchased but unfortunately it has not been aquired yet. It is unclear as to why this land aquisition is taking so long. The town feels as though this portion of the agreement is taking much longer than needed and additionally has not been sufficiently kept abreast of the process. It is hopeful that communication will improve and the transaction will be completed promptly.

7. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
No

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INTERVIEW RECORD

Site Name: PSC Resources		EPA ID No.: MAD8980731483	
Subject: Five Year Review - state comments		Time:	Date: 7/7/10
Type: <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> E-mail <input type="checkbox"/> Other <input type="checkbox"/> Visit Location of Visit:		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing	

Contact Made By:

Name: Kimberly White	Title: RPM	Organization: USEPA
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Individual Contacted:

Name: Paul Craffey	Title: NPL Site Manager	Organization: MassDEP
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Telephone No: 617-292-5591	Street Address: One Winter Street
Fax No: 617-292-5530	City, State, Zip: Boston, MA 02108

E-Mail Address: paul.craffey@state.ma.us

Summary of Conversation

- 1. What is your overall impression of the project? (general sentiment)**
The Site seems to be well managed and maintained by the PRP's supervising contractor, O'Brien & Gere Engineering.
- 2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.**
The current reporting requirements is semi-annually, which is being done appropriately by the PRP's contractor. If needed the MassDEP sends comments. The PRP representatives have been responsive in their comments. The last site visit by the MassDEP Boston Office was June 26, 2007 to observe a sampling event and inspect the landfill. The MassDEP had some comments regarding the fence and landfill cover, that were dealt with by the PRP's contractor.
- 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 responses.**
None.
- 4. Do you feel well informed about the site's activities and progress?**
Yes, the PRP's representatives have kept the MassDEP informed.
- 5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?**
The Site seems to be well maintained.

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INTERVIEW RECORD

Site Name: PSC Resources Superfund Site		EPA ID No.: MAD 980731483	
Subject: Five Year Review - Construction Considerations		Time:	Date: 6/18/10
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> E-mail <input checked="" type="checkbox"/> Other written response <input type="checkbox"/> Visit Location of Visit:		<input checked="" type="checkbox"/> Incoming <input type="checkbox"/> Outgoing	

Contact Made By:

Name: Kimberly White	Title: RPM	Organization: USEPA
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Individual Contacted:

Name: James Heckathorne	Title: Project Coordinator	Organization: O'Brien & Gere Engineers, Inc
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Telephone No: 315-437-6100	Street Address: 5000 Brittonfield Parkway
Fax No:	City, State, Zip: East Syracuse, NY 13057

E-Mail Address: jim.heckathorne@obg.com

Summary of Conversation

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

The PSC Resources Superfund Site Project has been implemented extremely well. Each phase of the project has been managed and implemented in accordance with all applicable requirements. The selected remedy for the Site is successful in meeting the Performance Standards.

2. What is the current status of the operation and maintenance activities?

Operation and Maintenance (O&M) includes semiannual cap and drainage swale inspection and maintenance. Activities include mowing of the cap, clearing growth in the swale area and fenceline. Occasional removal of animals burrowing in the landfill cap is required. Inspection reports are submitted to the agencies semiannually.

3. Have any problems been encountered which required, or will require, changes to the Operation and Maintenance Plan, Environmental Monitoring Work Plan and/or the Project Operations Plan?

No problems have been encountered which require changes to the O&M Plan, Environmental Monitoring Work Plan and/or Project Operations Plan.

4. Have any problems or difficulties been encountered which have impacted the implementability of the remedy?

No problems have been encountered which have impacted the implementability of the remedy.

5. Would you consider the animal borrowings encountered on the landfill cap to be a potential long-term issue? If so, how and what measure have been taken to control this issue?

Inspections of the landfill cap are performed semiannually. To date, removal of burrowing animals from the landfill cap was performed as needed on two occasions (October 11, 2007 and June 15, 2009). A subsequent inspection showed the presence of an animal burrow which is scheduled to be removed in June 2010. Inspections of the landfill cap will continue to be performed semiannually and animal burrows will continue to be removed as required. Because the cap includes a synthetic geomembrane, covered by at least two feet of soil barrier, the presence of burrowing animals does not pose a significant threat to the integrity of the cap or to the animals.

6. Do you have any comments, suggestions, or recommendations regarding the project (i.e., design, construction documents, constructability, management, regulatory agencies, etc.)?

Performance Standards have been achieved in all site media. Ground water monitoring to verify attainment of the Performance Standards was performed in June 2010 in accordance with the Statement of Work. The analytical results are pending.

O&M should continue to be performed at the Site in accordance with the current program.

INTERVIEW RECORD

Site Name: PSC Resources		EPA ID No.: MAD980731483	
Subject: Five Year Review - PRP Interview		Time:	Date: 6/17/10
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> E-mail <input checked="" type="checkbox"/> Other Written response <input type="checkbox"/> Visit Location of Visit:		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing	
Contact Made By:			
Name: Kimberly White	Title: RPM	Organization: EPA	
Individual Contacted:			
Name: Gary Gill-Austern	Title: Project Manager	Organization: Nutter McClennen & Fish, LLP	
Telephone No: 617-439-2250		Street Address: Seaport West, 155 Seaport Boulevard	
Fax No: 617-310-9250		City, State, Zip: Boston, MA 02210	
E-Mail Address: glg@nutter.com			
Summary of Conversation			
<p>1. What is your overall impression of the project? (general sentiment)</p> <p>The project represents a successful collaboration between the Performing Settling Defendants, EPA and MassDEP to remediate a contaminated site. As of the 2009 Environmental Monitoring Event, the Performance Standards specified in the Consent Decree have been attained for all site media. We concur with the reponse of the Performing Settling Defendants' Supervising Contractor, O'Brien & Gere, that the project has been implemented extremely well.</p> <p>2. What effects have site operations had on the surrounding community?</p> <p>Activities on the site include operation and maintenance activities on a twice a year basis and groundwater monitoring on a once a year basis at most. We are not aware of any effect such activities have on the surrounding community.</p> <p>3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.</p> <p>We are not aware of any community concerns regarding the Site or its operation and administration.</p> <p>4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.</p> <p>There have been no emergency responses at the Site. Please see Attachment A for a list of vandalism and trespassing issues at the Site since the last five-year review.</p> <p>5. With the contaminant concentrations at clean-up levels, are you aware of any plans for the Site (if it is closed out)?</p> <p>The Site is owned by the Town of Palmer. We are not aware of any plans for the Site.</p> <p>6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?</p> <p>We appreciate the collaborative and collegial relationship we have enjoyed with EPA and MassDEP and look forward to continuing that relationship.</p>			

Attachment A to EPA Interview Record

PSC Resources Site—EPA ID No. MAD980731483

Question 4: Site Vandalism and Trespassing

The following incidents of vandalism and trespassing have been reported at the Site since the last five-year review:

1. During the Summer 2006 environmental monitoring event, it was observed that six, 8-foot sections of the wood-rail fence on the western end of the southern property boundary were cut down and pushed out of place. The fence posts and rails for the six sections of damaged fence were observed on the ground. No tire tracks or other evidence of unauthorized vehicles driving on the Site were observed. EPA was orally notified of the vandalism on July 10, 2006, and the Project Manager notified the Chief of Police in Palmer by letter dated July 10, 2006. This was documented in the April - June 2006 Quarterly Progress Report and in the letter to the Chief of Police, a copy of which was provided to EPA.
2. The wood-rail fence along the western end of the northern property boundary was apparently vandalized, in September 2006. The Performing Settling Defendants' Supervising Contractor, O'Brien & Gere, notified the Palmer Police Department. This was documented in the July - September 2006 and October - December 2006 Quarterly Progress Reports.
3. On May 23 and 24, 2007, respectively, MassDEP and USEPA received phone calls from Robert Hafner, an abutter to the Site, regarding his observations of All-Terrain Vehicle (ATV)-type recreational vehicles on the Site on May 13 and 21, 2007. The Performing Settling Defendants' Supervising Contractor, O'Brien & Gere, spoke with Mr. Hafner regarding his observations on June 21 and 26, 2007. This was documented in the April - June 2007 Quarterly Progress Report.
4. During the inspection of the cap and drainage swale on June 25, 2008, some vegetation was observed to be damaged by ATV activity at the Site. ATV tracks were observed along the Quaboag River in the wetland areas west of the cap. In addition, certain areas along the southern property fence (outside the restored/enhanced wetland area on the property owned by Hafner) were observed to have been mowed. The Chief of Police in Palmer was contacted to discuss trespassing issues at the Site. This was documented in the June 2008 cap and drainage swale inspection report.
5. During the inspection of the cap and drainage swale on September 30, 2008, some vegetation was observed to be damaged by ATV activity at the Site. ATV

tracks were observed along the Quaboag River in the wetland areas west of the cap. The Chief of Police in Palmer was contacted regarding trespassing issues at the Site. With the exception of two tree specimens in the forested portion of Wetland #5, the ATV tracks are not causing significant damage to the wetland plants. This was documented in the September 2008 cap and drainage swale inspection report and the Independent Quality Assurance Term ("IQAT") Summer 2008 IQAT Report.

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Appendix D

Site Inspection Checklist and Photo Log

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I. SITE INFORMATION

Site Name: PSC Resources

Location and Region: Palmer, Massachusetts EPA ID: MAD980731483

Date of Inspection: 5/18/2010 : Weather/temperature Clear

Agency, office, or company leading the 5-year review: USEPA

Remedy Includes: (Check all that apply)

<input checked="" type="checkbox"/> Landfill cover/containment	<input checked="" type="checkbox"/> Monitored natural attenuation
<input type="checkbox"/> Access controls	<input type="checkbox"/> Groundwater containment
<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls
<input type="checkbox"/> Groundwater pump and treatment	<input type="checkbox"/> Surface water collection and treatment
<input type="checkbox"/> Other: _____	

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS

1. O&M Site Manager James Heckathorne Project Coordinator _____

	Name	Title	Date
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input checked="" type="checkbox"/> by phone			Phone no. 315-437-6100
Problems, suggestions; Report attached	<u>see attached report</u>		

2. O&M Staff Judy Shanahan Senior Project Manager _____

	Name	Title	Date
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input checked="" type="checkbox"/> by phone			Phone no. 315-437-6100
Problems, suggestions; Report attached	<u>see attached report</u>		

II. INTERVIEWS (cont'd)

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 Town of Palmer

Contact	<u>David Johnson</u>	<u>Conservation Commission Chairman</u>	<u>6/9/10</u>	<u>413-283-2611</u>
	Name	Title	Date	Phone no.

Problems, suggestions; Report attached see attached report

Agency Town of Palmer

Contact	<u>Linda Leduc</u>	<u>Town Planner</u>	<u>6/7/10</u>	<u>413-283-2605</u>
	Name	Title	Date	Phone no.

Problems, suggestions; Report attached see attached report

Agency MassDEP

Contact	<u>Paul Craffey</u>	<u>NPL Site Manager</u>	<u>7/7/10</u>	<u>617-292-5591</u>
	Name	Title	Date	Phone no.

Problems, suggestions; Report attached see attached report

Agency _____

Contact	_____	_____	_____	_____
	Name	Title	Date	Phone no.

Problems, suggestions; Report attached _____

4. Other interviews

(optional)

Reports attached.

Name of Personnel	Title
<u>Jed Terwilliger</u>	<u>Compliance Officer at Turley Publications</u>
<u>Gary Gill-Austern</u>	<u>Attorney at Nutter, McClennen & Fish, representing PSDs</u>

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

1. O&M Documents

- | | | | |
|--|---|--|------------------------------|
| <input checked="" type="checkbox"/> O&M manual: | <input type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up to date | <input type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> As-built drawings: | <input type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up to date | <input type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> Maintenance logs: | <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up to date | <input type="checkbox"/> N/A |

Remarks _____

2. Site-Specific Plans

- | | | | |
|---|--|-------------------------------------|---|
| <input type="checkbox"/> Health and Safety Plan | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Contingency plan/emergency response plan | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input type="checkbox"/> N/A |

Remarks _____

3. Training Records

- | | | | |
|---------------------------------|--|-------------------------------------|---|
| <input type="checkbox"/> O&M | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> OSHA | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input type="checkbox"/> N/A |

Remarks _____

4. Permits and Service Agreements

- | | | | |
|--|--|-------------------------------------|---|
| <input type="checkbox"/> Air discharge permit | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Effluent discharge | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Waste disposal, POTW | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Dumpster for the City | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input type="checkbox"/> N/A |

Remarks _____

5. Gas Generation Records

- | | | |
|--|-------------------------------------|---|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input checked="" type="checkbox"/> N/A |
|--|-------------------------------------|---|

Remarks _____

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Cont'd)

6. Settlement Monument Records

Readily available Up to date N/A

Remarks _____

7. Groundwater Monitoring Records

Readily available Up to date N/A

Remarks _____

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 _____

IV. OPERATION & MAINTENANCE COSTS

1. O&M Organization

- | | | |
|--|--|------------------------------|
| <input type="checkbox"/> State in-house | <input type="checkbox"/> Contractor for State | <input type="checkbox"/> N/A |
| <input type="checkbox"/> PRP in-house | <input checked="" type="checkbox"/> Contractor for PRP | <input type="checkbox"/> N/A |
| <input type="checkbox"/> Federal Facility in-house | <input type="checkbox"/> Contractor for Federal Facility | <input type="checkbox"/> N/A |

Other: _____

2. O&M Cost Records

- | | | |
|--|-------------------------------------|---|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> Funding mechanism/agreement in place | | |
| <input type="checkbox"/> Original O&M cost estimate | _____ | <input type="checkbox"/> Breakdown attached |

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

3. Unanticipated or Unusually High O&M Costs During Review Period

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS

Applicable N/A

A. Fencing

1. Fencing damaged

Location shown on site map Gates secured N/A

Remarks _____

B. Other Access Restrictions

1. Signs and other security measures

Location shown on site map N/A

Remarks _____

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 _____

t

Name	Title	Date	Phone no.
Reporting is up-to-date		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A
Reports are verified by the lead agency		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A
Specific requirements in deed or decision documents have been met		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A
Violations have been reported		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A

Other problems or suggestions: Report attached _____

V. ACCESS AND INSTITUTIONAL CONTROLS (cont'd)

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 _____

2. Land use changes on site

Redevelopment N/A

Remarks _____

3. Land use changes off site

N/A

Remarks _____

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

Aerial extent _____ Depth _____

Remarks _____

2. Cracks

Location shown on site map Cracking not evident

Length _____ Width _____ Depth _____

Remarks _____
s _____

3. Erosion

Location shown on site map Erosion not evident

Aerial extent _____ Depth _____

Remarks _____
s _____

4. Holes

Location shown on site map Holes not evident

Aerial extent _____ Depth _____

Remarks _____
s _____

5. Vegetative Cover

Grass Cover properly established No signs of stress

Trees/Shrubs (indicate size and locations on a diagram)

Remarks _____
s _____

VII. Landfill Covers (cont'd)

6. Alternative Cover (armored rock, concrete, etc.)

Remark

s _____

7. Bulges

Location shown on site map

Bulges not evident

Aerial extent
Remark

Height

s _____

8. Wet Areas/Water Damage

Wet areas/water damage not evident

Wet areas

Location shown on site map

Aerial extent

Ponding

Location shown on site map

Aerial extent

Seeps

Location shown on site map

Aerial extent

Soft subgrade

Location shown on site map

Aerial extent

Remark

s _____

9. Slope Instability

Slides

Location shown on site map

No evidence of slope instability

Aerial extent

Remark

s _____

VII. Landfill Covers (cont'd)

B. Benches

(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.)

Applicable N/A

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

(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.)

Applicable N/A

1. Settlement

Location shown on site map No evidence of settlement

Aerial extent _____ Depth _____
Remarks _____
s _____

VII. Landfill Covers (cont'd)

2. Material Degradation

Location shown on site map

No evidence of degradation

Material type _____

Aerial extent _____

Remark _____

s

3. Erosion

Location shown on site map

No evidence of erosion

Aerial extent _____

Depth _____

Remark _____

s

4. Undercutting

Location shown on site map

No evidence of undercutting

Aerial extent _____

Depth _____

Remark _____

s

5. Obstructions

Type _____

No obstructions

Location shown on site map

Aerial extent _____

Size _____

Remark _____

s

6. Excessive Vegetative Growth

Type _____

No evidence of excessive growth

Vegetation in channels does not obstruct flow

Location shown on site map

Aerial extent _____

Remark _____

s

VII. Landfill Covers (cont'd)

E. Gas Collection and Treatment Applicable N/A

1. Gas Treatment Facilities

Flaring Thermal destruction Collection for reuse

Good condition Needs Maintenance

Remark
s _____

2. Gas Collection Wells, Manifolds and Piping

Good condition Needs Maintenance

Remark
s _____

3. Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings)

Good condition Needs Maintenance N/A

Remark
s _____

F. Cover Drainage Layer Applicable N/A

1. Outlet Pipes Inspected Functioning N/A

Remark
s _____

2. Outlet Rock Inspected Functioning N/A

Remark
s _____

VII. Landfill Covers (cont'd)

G. Detention/Sedimentation Ponds Applicable N/A

1. Siltation

Aerial extent _____ Depth _____ N/A

Siltation not evident

Remark

s _____

2. Erosion

Aerial extent _____ Depth _____

Erosion not evident

Remark

s _____

3. Outlet Works

Functioning N/A

Remarks _____

4. Dams

Functioning N/A

Remark

s _____

H. Retaining Walls Applicable N/A

1. Deformations Location shown on site map Deformation not evident

Horizontal displacement _____ Vertical displacement _____

Rotational displacement _____

Remark

s _____

2. Degradation Location shown on site map Degradation not evident

Remark

s _____

VII. Landfill Covers (cont'd)

I. Perimeter Ditches/Off-Site Discharge

Applicable N/A

1. **Siltation** Location shown on site map Siltation not evident

Aerial extent _____ Depth _____

Remark _____
s _____

2. **Vegetative Growth** Location shown on site map N/A

Vegetation does not impede flow

Aerial extent _____ Depth _____

Remark _____
s _____

3. **Erosion** Location shown on site map Erosion not evident

Aerial extent _____ Depth _____

Remark _____
s _____

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

Remark _____
s _____

VIII. VERTICAL BARRIER WALLS

Applicable N/A

1. **Settlement**

Location shown on site map Settlement not evident

Aerial extent _____ Depth _____

Remark _____
s _____

VIII. VERTICAL BARRIER WALLS (cont'd)

2. Performance Monitoring

Type of monitoring _____
 Performance not monitored
Frequency _____ Evidence of breaching
Head differential _____
Remarks _____
s _____

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 _____

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

1. Collection Structures, Pumps, and Electrical

Good condition Needs Maintenance

Remarks _____

IX. GROUNDWATER/SURFACE WATER REMEDIES (cont'd)

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: _____
- Filter _____
- s _____
- Additive (e.g., chelation agent, flocculent) _____
- Other _____
- s _____
- 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 _____

2. Electrical Enclosures and Panels (properly rated and functional)

N/A Good condition Needs Maintenance

Remarks _____

IX. GROUNDWATER/SURFACE WATER REMEDIES (cont'd)

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 Needs repair

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 _____

D. Monitoring Data

1. Monitoring Data

Is routinely submitted on time Is of acceptable quality

2. Monitoring data suggests:

Groundwater plume is effectively contained Contaminant concentrations are declining

E. 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.).

see 5YR review

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.

see 5YR review

XI. OVERALL OBSERVATIONS (cont'd)

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.

There are no current indicators of potential remedy problems.

D. Opportunities for Optimization

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

Optimizations have been made by the O&M contractor, O'Brien & Gere, through technical evaluations of the data. As a result, cost have been reduced and monitoring task have been optimized. At this point, the only contaminants of concern that have not achieved performance standards are being monitored.

**PSC Resources Superfund Site
May 18, 2010 Site Inspection Photo Log**



Photo 1: Landfill Cap, 5/18/2010



Photo 2: Signage and Security

**PSC Resources Superfund Site
May 18, 2010 Site Inspection Photo Log - *Continued***



Photo 3: Drainage Swales along Landfill Cap



Photo 4: Wetland Enhancement Area

**PSC Resources Superfund Site
May 18, 2010 Site Inspection Photo Log - *Continued***



Photo 5: Forested Area



Photo 6: Secured Site Wells

**PSC Resources Superfund Site
May 18, 2010 Site Inspection Photo Log - *Continued***



Photo7: Quaboag River

Appendix E

Public Notice

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EPA Starts Five-Year Review of PSC Resources Superfund Site

The U.S. Environmental Protection Agency (EPA) has begun its third Five-Year Review of the PSC Resources Superfund Site, Palmer, MA. Five-Year Reviews are required by law and occur every five years. The reviews determine if the cleanup is protective of human health and the environment. This Five-Year Review will be completed by October 2010 and the results will be publicly available.

The site remedy included stabilization of the on-site contaminated soils and sediments, followed by capping. Initial actions taken in 1986 by MA DEP were cleaning and removal of tanks containing hazardous waste, and fencing. EPA repaired and reinforced the fence in 1991. Decontamination and demolition of buildings and other site structures was completed in 1995. Warning signs were also posted. Previous reviews showed the remedy is performing as expected, and is protective of human health and the environment.

Contaminants at the site included VOCs, including benzene and methylene chloride, in groundwater; and polychlorinated biphenyls (PCBs) and lead in soil. Contaminated soils have been removed and treated. Annual monitoring has shown that all groundwater cleanup levels may have recently been achieved.

More information about the cleanup can be found on-line at www.epa.gov/ne/superfund/sites/psc or at the Palmer Public Library, 455 North Main Street, Palmer, MA 01069.



For more information, contact:
Don McElroy Toll Free
1-888-372-7341, ext. 81326
mcelroy.don@epa.gov
www.epa.gov/ne/superfund/sites/psc

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Analytical Data

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LIST OF TABLES

Historic Groundwater Analytical Results and Cleanup Levels

<u>Table Number</u>	<u>Monitoring Well</u>
Table 1A	MW-101C
Table 1B	MW-102B
Table 1C	MW-103C
Table 1D	MW-104B
Table 1E	MW-104C
Table 1F	MW-105B
Table 1G	MW-112S

Historic Wetland Sediment Analytical Results and Cleanup Levels

<u>Table Number</u>	<u>Monitoring Location</u>
Table 2	EM-WL-SED-01 thru EM-WL-SED-04

Table 1A
PSC Resources Superfund Site
Palmer, MA
Historic Ground Water Analytical Results and Cleanup Levels
MW-101C - Overburden Monitoring Well

Chemical	ICLs	1998		1999				2000			2001		2002		2003	2004	2005	2006	2007	2008	2009
		9/30	12/14	3/16	6/14	9/20	12/13	3/13	6/12	12/19	6/4	12/10	6/17	12/3	6/17	6/21	6/23	6/20	6/25	6/26	6/22
Metals (mg/L)																					
Lead	0.015	0.005 U	0.005 U	0.005 U	0.003 J	0.005 U	0.0013 J	0.005 U	0.005 U	0.005 U	0.01 U	0.01 U	NA								
SVOCs (ug/L)																					
BEHP	6	5.3 U	5.3 U	5.2 U	5.1 U	5.2 U	6.7 U	5.1 U	1.0 J	5.3 U	5.0 U	5.2 U	5.0 U	5 U	5.1 U	5.1 U	1.1 J	5.1 U	5.2 U	5.2 U	NA
VOCs (ug/L)																					
1,1,1-TCA	200	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U	0.5 U									
1,1-DCA	3600	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U	0.5 U									
MEK	350	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U												
Acetone	3500	10 U	1.3 J	10 U	10 U	10 U	10 U	1.8 J	10 U	10 U	10 U	10 U	10 U	10 U							
Benzene	5	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U	0.5 U								
Meth chlor	5	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2.0 U	2 U	2.0 U	2.0 U	2.0 U	2.00 U	2 U	2 U	2 U	2 U				
PCE	5	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U	0.5 U								
TCE	5	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U	0.5 U								
VC	2	1.0 U	1 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.00 U	1 U	1 U	1 U	1 U								
cis-1,2-DCE	70	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U	0.5 U								
t-1,2-DCE	100	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U	0.5 U								

Notes:

Only parameters with cleanup levels are reported
U = Not detected
* = exceeds cleanup level
NA = Not Analyzed

D = result from diluted analysis
ICLs = Interim Cleanup Levels
J = Estimated

Parameters:

BEHP = bis(2-Ethylhexyl)phthalate
1,1,1-TCA = 1,1,1-Trichloroethane
1,1-DCA = 1,1-Dichloroethane

MEK = 2-Butanone
PCE = Tetrachloroethene
TCE = Trichloroethene

Meth Chlor = Methylene Chloride
t-1,2-DCE = trans-1,2-Dichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene

VC = Vinyl chloride

Table 1B
PSC Resources Superfund Site
Palmer, MA
Historic Ground Water Analytical Results and Cleanup Levels
MW-102B - Overburden Monitoring Well

Chemical	ICLs	1998		1999				2000			2001		2002		2003	2004	2005	2006	2007	2008
		9/29	12/14	3/16	6/14	9/20	12/13	3/13	6/12	12/19	6/5	12/11	6/17	12/3	6/17	6/22	6/23	6/20	6/26	6/26
Metals (mg/L)																				
Lead	0.015	0.005 U	0.01 U	0.01 U																
SVOCs (ug/L)																				
BEHP	6	5.1 U	5.2 U	5.0 U	5.1 U	5.3 U	5.1 U	5.2 U	5.0 U	5.0 U	1.7 J	5.1 U	5.0 U	5.0 U	5.1 U	1.9 J	5.1 U	5.1 U	5.6 U	
VOCs (ug/L)																				
1,1,1-TCA	200	0.50 U	0.50 U	0.50 U																
1,1-DCA	3600	0.66	0.50	0.50 U	0.50	0.45 J	0.33 J	0.25 J	0.21 J	0.24 J	0.13 J	0.25 J	0.50 U	0.11 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	
MEK	350	10 U	10 U	10 U																
Acetone	3500	10 U	10 U	10 U	10 U	2.3 J	10 U	1.2 J	10 U	4.7 J	10 U	1.9 J	10 U	10 U						
Benzene	5	0.50 U	0.50 U	0.50 U																
Meth chlor	5	0.50 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.00 U	2.0 U					
PCE	5	0.50 U	0.50 U	0.50 U																
TCE	5	0.50 U	0.23 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U											
Vinyl Chloride	2	0.43 J	1.0 U	1.0 U	0.35 J	0.27 J	0.27 J	1.0 U	1.0 U	1.0 U										
cis-1,2-DCE	70	0.82	0.67	0.29 J	0.62	0.52	1.2	0.33 J	0.28 J	0.44 J	0.21 J	0.38 J	0.14 J	0.15 J	0.50 U	0.21 J	0.50 U	0.50 U	0.50 U	
trans-1,2-DCE	100	0.50 U	0.50 U	0.50 U																

Notes:

Only parameters with cleanup levels are reported
U = Not detected
* = exceeds cleanup level

D = result from diluted analysis
ICLs = Interim Cleanup Levels
J = Estimated

Parameters:

BEHP = bis(2-Ethylhexyl)phthalate MEK = 2-Butanone Meth Chlor = Methylene Chloride
1,1,1-TCA = 1,1,1-Trichloroethane PCE = Tetrachloroethene trans-1,2-DCE = trans-1,2-Dichloroethene
1,1-DCA = 1,1-Dichloroethane TCE = Trichloroethene cis-1,2-DCE = cis-1,2-Dichloroethene

Table 1C
PSC Resources Superfund Site
Palmer, MA
Historic Ground Water Analytical Results and Cleanup Levels
MW-103C - Bedrock Monitoring Well

Chemical	ICLs	1999		1999				2000		2001		2002		2003	2004	2005	2006	2007	2008
		9/29	12/15	3/17	6/15	9/23	12/14	7/11	12/20	6/6	12/11	6/18	12/4	6/17	6/22	6/23	6/21	6/26	6/26
Metals (mg/L)																			
Lead	0.015	0.005 U	0.001 J	0.002 J	0.005 U	0.005 U	0.005 U	0.005 U	0.0011 J	0.00089 J	0.005 U	0.005 U	0.01 U	0.01 U					
SVOCs (ug/L)																			
BEHP	6	5.3 U	5.0 U	5.1 U	5.1 U	5.2 U	5.2 U	5.1 U	5.0 U	5.1 U	1.3 J	5.0 U	5 U	5.0 U	5.0 U	5.2 U	5.2 U	5.2 U	5.1 U
VOCs (ug/L)																			
1,1,1-TCA	200	0.50 U	2.5 UD	5.0 U	0.50 U	2.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U
1,1-DCA	3600	6.3	5.8 D	4.4 J	3.5	2.7	2.6	4.0	4.0	1.9	2.2	0.96	3.8	2.5	1.8	1.4	0.46 J	0.7	0.76
MEK	350	10 U	50 UD	100 U	10 U	50 U	10 U	1.3 J	10 U	10 U	10 U	10 U	10.0 U	10 U	10 U				
Acetone	3500	10 U	50 UD	100 U	10 U	50 U	10 U	10 U	51 J	10 U	10 U	6.0 J	10 U	0.98 J	10 U	10 U	10.0 U	10 U	10 U
Benzene	5	46 *	130 D *	100 *	130 *	130 *	100 *	18 *	33 *	26 *	13 *	14 *	45 *	18 *	1.9	1.5	0.57	0.67	1.48
Meth chlor	5	0.51 U	1.6 JD	5.0 U	1.2 U	2.5 U	2.0 J	2 U	0.54 J	2.0 U	0.32 J	2.0 U	1.1 J	2.0 U	2.0 U	2.0 U	2.00 U	2 U	2 U
PCE	5	0.50 U	2.5 UD	5.0 U	0.50 U	2.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.16 J	0.71	0.26 J	2.35	0.59
TCE	5	0.50 U	2.5 UD	5.0 U	0.50 U	2.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.17 J	0.50 U	0.12 J	0.50 U	0.50 U	0.30 J	0.25 J	1.38	1.6
VC	2	12 *	5.8 D *	6.6 J *	0.49 J	5.0 U	1.0 U	1.0 U	1.4	0.11 J	1 U	1.0 U	1 U	0.14 J	1.0 U	1.0 U	1.00 U	1 U	1 U
cis-1,2-DCE	70	4.7	2.1 JD	5.0 U	0.29 J	2.5 U	0.10 J	0.50 U	0.15 J	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.27 J	0.27 J
t-1,2-DCE	100	0.50 U	2.5 UD	5.0 U	0.88	2.5 U	0.50 U	0.14 J	0.17 J	0.12 J	0.5 U	0.12 J	0.43 J	0.19 J	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U

Notes:

Only parameters with cleanup levels are reported

U = Not detected

* = exceeds cleanup level

D = result from diluted analysis

ICLs = Interim Cleanup Levels

J = Estimated

Parameters:

BEHP = bis(2-Ethylhexyl)phthalate

1,1,1-TCA = 1,1,1-Trichloroethane

1,1-DCA = 1,1-Dichloroethane

MEK = 2-Butanone

PCE = Tetrachloroethene

TCE = Trichloroethene

Meth Chlor = Methylene Chloride

t-1,2-DCE = trans-1,2-Dichloroethene

cis-1,2-DCE = cis-1,2-Dichloroethene

VC = Vinyl chloride

Table 1D
PSC Resources Superfund Site
Palmer, MA
Historic Ground Water Analytical Results and Cleanup Levels
MW-104B - Overburden Monitoring Well

Chemical	ICLs	1998		1999				2000			2001		2002		2003	2004	2005	2006	2007	2008	2009
		10/9	12/15	3/17	6/15	9/20	12/13	3/13	6/13	12/21	6/6	12/12	6/18	12/5	6/17	6/23	6/24	6/21	6/27	6/27	6/23
Metals (mg/L)																					
Lead	0.015	0.005 U	0.01	0.002 J	0.005 U	0.01 U	0.01 U	NA													
SVOCs (ug/L)																					
BEHP	6	5.7	5.2 UJ	5.1 U	5.3 U	5.1 U	6.7 U	5.1 U	5.2 U	2.0 J	2.4 J	5.1 UJ	5.0 U	5 U	5.0 U	5.2 U	3400 *	5.2 U	5.2 U	1.2 J	NA
VOCs (ug/L)																					
1,1,1-TCA	200	0.50 U	50 UD	5.0 U	0.50 U	5.0 U	2.5 U	0.50 U	1.0 U	0.50 U	0.50 U	1 U	1.2 U	0.5 U	1.3 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U
1,1-DCA	3600	12	20 D	7.0	5.8	17 J	11	6.0	5.3	12	6.5	5.1	2.6	2.4	4.3	5.5	3.4	1.6	1.5	1.27	0.47 J
MEK	350	10 U	1000 UD*	100 U	10 U	100 U	50 U	10 U	20 U	10 UJ	10 U	20 U	25 UJ	10 U	25 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	3500	10 U	250 UD*	100 U	10 U	90 J	50 U	10 U	20 U	79 J	11 U	20 U	25 UJ	10 UJ	25 U	10 UJ	10 U	10 U	10 U	10 U	10 U
Benzene	5	91 *	2700 D *	110 *	130 *	310 J *	120 *	58 *	47 *	82 *	67 *	51 *	68 *	70 *	30 *	26 *	19 *	5.8 *	6.37 *	7.57 *	2.55
Meth chlor	5	1.1 U	50 UD*	5.0 U	0.65 U	2.5 U	10 UJ*	0.37 J	4.0 U	2.0 U	2.0 U	0.53 J	5.0 U	0.43 J	5.0 U	0.41 J	2.0 U	0.31 J	2 U	2 U	2 U
PCE	5	0.50 U	12 UD*	5.0 U	0.50 U	5.0 U	2.5 U	0.50 U	1.0 U	0.50 U	0.50 U	1.0 U	1.2 U	0.5 U	1.3 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	1.10
TCE	5	0.50 U	50 UD*	5.0 U	0.11 J	5.0 U	2.5 U	0.50 U	1.0 U	0.50 U	0.50 U	1.0 U	1.2 U	0.5 U	1.3 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.28 J
VC	2	1.0 U	100 UD*	10 U	1.0 U	10 U*	5.0 U*	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	2.5 U*	1.0 U	2.5 U*	1.0 U	1.0 U	1.0 U	1 U	1 U	1 U
cis-1,2-DCE	70	0.25 J	32 D	5.0 U	0.50 U	5.0 U	2.5 U	0.50 U	1.0 U	0.50 U	0.50 U	1.0 U	1.2 U	0.5 U	1.3 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U
t-1,2-DCE	100	0.90	12 UD	5.0 U	0.22 J	5.0 U	2.5 U	0.15 J	1.0 U	0.33 J	0.18 J	1.0 U	1.2 U	0.18 J	1.3 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U

Notes:

Only parameters with cleanup levels are reported
U = Not detected
* = exceeds cleanup level
NA = Not Analyzed

D = result from diluted analysis
ICLs = Interim Cleanup Levels
J = Estimated

Parameters:

BEHP = bis(2-Ethylhexyl)phthalate
1,1,1-TCA = 1,1,1-Trichloroethane
1,1-DCA = 1,1-Dichloroethane

MEK = 2-Butanone
PCE = Tetrachloroethene
TCE = Trichloroethene

Meth Chlor = Methylene Chloride
t-1,2-DCE = trans-1,2-Dichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene

VC = Vinyl chloride

Table 1E
PSC Resources Superfund Site
Palmer, MA
Historic Ground Water Analytical Results and Cleanup Levels
MW-104C - Overburden Monitoring Well

Chemical	ICLs	1998		1999				2000			2001		2002		2003	2004	2005	2006	2007	2008
		9/29	12/15	3/18	6/15	9/23	12/14	3/14	6/13	12/20	6/6	12/12	6/18	12/5	6/17	6/23	6/24	6/21	6/26	6/27
Metals (mg/L)																				
Lead	0.015	0.004 J	0.005 U	0.005 J	0.004 J	0.017 *	0.007	0.003 J	0.004 J	0.003 J	0.004 J	0.0045 J	0.006	0.007	0.0095	0.0072	0.0025 J	0.0056	0.0063 J	0.005 J
SVOCs (ug/L)																				
BEHP	6	5.2 U	5.3 U	5.1 U	5.1 U	5.1 U	5.1 U	5.3 U	1.3 J	3.6 J	2.6 J	5.1 U	5.2 U	5.2 U	5.0 U	2.6 J	1.5 J	5.3 U	5.1 U	5.3 U
VOCs (ug/L)																				
1,1,1-TCA	200	5.0 U	2.5 UD	5.0 U	0.50 U	10 U	0.30 J	0.50 U	0.50 U	0.50 U	0.50 U	1 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U
1,1-DCA	3600	100	11 D	50 U	31	3.0 J	4.9	0.82	0.96	0.41 J	0.72	4.4	0.16 J	0.11 J	0.12 J	0.82	0.21 J	0.17 J	0.38 J	0.17 J
MEK	350	100 U	50 UD	1000 UJ*	10 U	200 U	10 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10.0 U	10 U	10 U
Acetone	3500	100 U	50 UD	1000 UJ*	10 U	200 U	10 U	10 U	10 U	10 U	10 U	20 U	2.8 J	10 U	10 U	10 U	10 U	1.20 J	10 U	10 U
Benzene	5	860 *	120 D *	2300 *	4900 *	530 *	190 *	39 *	40 *	8.3 *	72 *	120 J *	7.7 *	11 *	7.9 *	7.1 *	2.3	3.0	1.54	0.46 J
Meth chlor	5	5.0 U	1.2 JD	50 U*	0.50 U	10 U*	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	4 U	2.0 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U
PCE	5	5.0 U	2.5 UD	50 U*	0.37 J	10 U*	0.55	0.29 J	0.24 J	0.52	0.20 J	1 U	0.39 J	0.4 J	0.12 J	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U
TCE	5	2.6 J	2.5 UD	15 J *	5.5 *	10 U*	0.29 J	0.14 J	0.75	0.12 J	0.20 J	0.42 J	0.50 U	0.11 J	0.50 U	0.13 J	0.50 U	0.50 U	0.5 U	0.5 U
VC	2	5.9 J *	5.0 UD*	100 U*	1.9	20 U*	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2 U	1.0 U	1 U	1.0 U	0.11 J	1.0 U	1.00 U	1 U	1 U
cis-1,2-DCE	70	110 *	2.5 UD	50 U	78 *	7.4 J	5.8	0.88	1.2	0.16 J	0.75	3.6	0.20 J	0.17 J	0.20 J	0.63	0.18 J	0.17 J	0.23 J	0.5 U
t-1,2-DCE	100	2.1 J	2.5 UD	50 U	1.0	10 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U

Notes:

Only parameters with cleanup levels are reported

U = Not detected

* = exceeds cleanup level

D = result from diluted analysis

ICLs = Interim Cleanup Levels

J = Estimated

Parameters:

BEHP = bis(2-Ethylhexyl)phthalate

1,1,1-TCA = 1,1,1-Trichloroethane

1,1-DCA = 1,1-Dichloroethane

MEK = 2-Butanone

PCE = Tetrachloroethene

TCE = Trichloroethene

Meth Chlor = Methylene Chloride

t-1,2-DCE = trans-1,2-Dichloroethene

cis-1,2-DCE = cis-1,2-Dichloroethene

VC = Vinyl chloride

Table 1F
PSC Resources Superfund Site
Palmer, MA
Historic Ground Water Analytical Results and Cleanup Levels
MW-105B - Overburden Monitoring Well

Chemical	ICLs	1998		1999				2000			2001		2002		2003	2004	2005	2006	2007	2008	2009
		9/29	12/15	3/17	6/15	9/23	12/14	3/14	6/13	12/20	6/6	12/12	6/18	12/5	6/17	6/23	6/23	6/21	6/26	6/26	6/23
Metals (mg/L)																					
Lead	0.015	0.002 J	0.003 J	0.005 U	0.003 J	0.006	0.004 J	0.002 J	0.001 J	0.002 J	0.005 U	0.0025 J	0.004 J	0.003 J	0.0014 J	0.00088 J	0.005 U	0.00084 J	0.01 U	0.01 U	NA
SVOCs (ug/L)																					
BEHP	6	5.3 U	5.1 U	5.1 U	5.2 U	5.0 U	5.4 U	5.7 U	43 *	5.1 U	4.6 J	5.1 U	5.0 U	5 U	5.0 U	5.1 U	2.2 J	5.0 U	5.1 U	5 U	NA
VOCs (ug/L)																					
1,1,1-TCA	200	51	81 D	49	60	130	69	28	53	17	20	18	20.	7.9	5.2	4.2	2.1	2.00	1.42	0.96	0.28 J
1,1-DCA	3600	160	170 D	150	150	88	100	110	99	150	110	96	72.	50	68.	66.	55	67.0	43.1	26.1	26.8
MEK	350	100 U	100 UD	100 U	28 J	50 U	50 U	100 U	20 U	50	50 U	50 U	50 U	100 U	50 U	20 U	20 U	1.90 J	20 U	10 U	10 U
Acetone	3500	190	250 D	130	140	50 U	50 U	100 U	160	180 J	83 U	50 U	21. J	100 U	6.4 J	20 U	20 U	10.0 U	20 U	10 U	2.23 J
Benzene	5	14 *	15 D *	12 *	13 *	1.4 J	3.8	6.9 *	5.8 *	12 *	9.1 *	6.9 *	3.2	2.4 J	4.9	4.3	3.4	3.6	3.4	2.2	2.90
Meth chlor	5	5.0 U	1.3 JD	5.0 U	2.5 U	2.5 U	10 U*	20 U*	4.0 U	0.52 J	10 U*	10 U*	10 U*	20 U*	10 U*	4.0 U	0.26 J	2.0 U	4 U	2 U	2 U
PCE	5	5.0 U	5.0 UD	5.0 U	0.65 J	1.4 J	0.90 J	5.0 U	0.68 J	0.58 J	0.51 J	2.5 U	0.97 J	5 U	0.93 J	0.29 J	0.40 J	0.42 J	0.36 J	0.41 J	0.29 J
TCE	5	3.0 J	4.1 JD	2.8 J	3.1	1.6 J	1.8 J	5.0 U	2.2	2.6	1.6 J	1.1 J	2.3 J	5 U	1.2 J	0.99 J	0.82 J	0.81	0.82 J	0.55	0.37 J
VC	2	3.5 J *	5.9 JD *	13 *	5.2 *	5.0 U*	5.0 U*	6.9 J *	4.6 *	14 *	5.4 *	3.8 J *	3.7 J *	10 U*	5.1 *	4.1 *	4.1 *	5.5 *	2.9 J *	1.85	1.97
cis-1,2-DCE	70	61	59 D	44	44	12	30	16	22	36	20	21	16.	6.2	10.	11.	6.9	7.7	5.56	2.07	2.11
t-1,2-DCE	100	1.3 J	1.4 JD	1.2 J	1.2 J	2.5 U	2.5 U	5.0 U	0.72 J	1.8	0.97 J	2.5 U	2.5 U	5 U	0.61 J	0.45 J	0.34 J	0.34 J	0.28 J	0.5 U	0.14 J

Notes:

Only parameters with cleanup levels are reported

U = Not detected

* = exceeds cleanup level

NA = Not Analyzed

D = result from diluted analysis

ICLs = Interim Cleanup Levels

J = Estimated

Parameters:

BEHP = bis(2-Ethylhexyl)phthalate

1,1,1-TCA = 1,1,1-Trichloroethane

1,1-DCA = 1,1-Dichloroethane

MEK = 2-Butanone

PCE = Tetrachloroethene

TCE = Trichloroethene

Meth Chlor = Methylene Chloride

t-1,2-DCE = trans-1,2-Dichloroethene

cis-1,2-DCE = cis-1,2-Dichloroethene

VC = Vinyl chloride

Table 1G
PSC Resources Superfund Site
Palmer, MA
Historic Ground Water Analytical Results and Cleanup Levels
PSC112S - Overburden Monitoring Well

Chemical	ICLs	1998		1999				2000			2001		2002		2003	2004	2005	2006	2007	2008	2009
		10/9	12/14	3/17	6/14	9/20	12/13	3/13	6/12	12/20	6/6	12/11	6/17	12/4	6/17	6/22	6/23	6/21	6/26	6/26	6/23
Metals (mg/L)																					
Lead	0.015	0.005 U	0.01 U	0.01 U	NA																
SVOCs (ug/L)																					
BEHP	6	5.3 U	5.3 U	5.0 U	5.1 U	5.1 U	5.6 U	5.2 U	5.1 U	5.0 U	2.6 J	5.1 U	5.0 U	5.0 U	5.3 U	7.9 *	1.2 J	5.1 U	5.2 U	NA	
VOCs (ug/L)																					
1,1,1-TCA	200	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U										
1,1-DCA	3600	9.1	12	3.6	5.7	2.6 J	4.6	1.7	4.6	7.0	8.6	8.6	2.2	3.6	5.5	7.2	8.7	9.00	11.3	5.78	4.23
MEK	350	10 U	1.3 J	10 U	10 U	10 U	10 U														
Acetone	3500	9.4 J	10 U	10 U	10 U	2.1 J	10 U	10 U	7.2 J	10 U	1.80 J	10 U	10 U	10 U							
Benzene	5	0.79	3.0	0.64	2.0	0.47 J	0.97	0.39 J	0.78	0.70	1.2	0.96	0.18 J	0.42 J	0.44 J	0.58	0.61	0.49 J	0.71	0.3J	0.26 J
Meth chlor	5	0.5 U	0.50 U	0.50 U	0.50 U	0.5 U	2.0 U	2 U	2.0 U	2 U	2.0 U	2.0 U	2.0 U	2.00 U	2 U	2 U	2 U				
PCE	5	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U									
TCE	5	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U									
VC	2	0.20 J	0.28 J	0.48 J	1.0 U	1.0 U	0.11 J	1.0 U	1.0 U	1.0 U	1.0 U	0.24 J	1.0 U	1 U	0.20 J	0.13 J	0.24 J	0.30 J	0.69 J	1U	0.50 J
cis-1,2-DCE	70	0.18 J	0.14 J	0.50 U	0.50 U	0.50 U	2.3	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.50 U	0.5 U	0.13 J	0.50 U	0.10 J	0.26 J	0.41 J	0.18J	0.12 J
t-1,2-DCE	100	0.14 J	0.28 J	0.50 U	0.13 J	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U					

Notes:

Only parameters with cleanup levels are reported

U = Not detected

* = exceeds cleanup level

NA = Not Analyzed

D = result from diluted analysis

ICLs = Interim Cleanup Levels

J = Estimated

Parameters:

BEHP = bis(2-Ethylhexyl)phthalate

1,1,1-TCA = 1,1,1-Trichloroethane

1,1-DCA = 1,1-Dichloroethane

MEK = 2-Butanone

PCE = Tetrachloroethene

TCE = Trichloroethene

Meth Chlor = Methylene Chloride

t-1,2-DCE = trans-1,2-Dichloroethene

cis-1,2-DCE = cis-1,2-Dichloroethene

VC = Vinyl chloride

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Table 2
PSC Resources Superfund Site
Palmer, MA
Historic Wetland Sediment Analytical Results and Cleanup Levels (mg/kg)

Constituent:		Arsenic	Lead	Zinc	Constituent:		Arsenic	Lead	Zinc
Performance Standards:		0.012	375	550	Performance Standards:		0.012	375	550
Location	Sample Date				Location	Sample Date			
EM-WL-SED-01	9/23/1998	8 *	220	550 *	EM-WL-SED-02	9/23/1998	5.3 *	58	72
	12/17/1998	7.9 *	270	470		12/17/1998	5.0 *	59	71
	3/19/1999	3.8 J *	110	300 J		3/19/1999	6.3 J *	20	51 J
	6/16/1999	4.0 *	140	360		6/16/1999	5.7 *	63	70
	9/22/1999	4.1 *	88	510		9/22/1999	6.5 *	59	57
	12/14/1999	5.8 *	170	390		12/14/1999	4.7 *	13	42
	3/14/2000	4.8 *	150	400		3/14/2000	4.8 *	25	58
	6/14/2000	3.9 *	110	220		6/14/2000	6.4 *	51	66
	12/22/2000	7.0 *	150	480		12/22/2000	4.6 *	55	72
	6/5/2001	10 *	150	590 *		6/5/2001	5.4 *	56	80
	12/12/2001	8.6 *	130	510		12/12/2001	6.6 *	61	81
	6/19/2002	8.9 *	94	460		6/19/2002	6.0 *	75	81
	12/4/2002	9.0 *	99	290		12/4/2002	6.1 *	65	71
	6/18/2003	10 *	140	500		6/18/2003	5.6 *	59	77
	6/23/2004	na	94J	324		6/23/2004	na	na	74
6/24/2005	na	na	520						

Constituent:		Arsenic	Lead	Zinc	Constituent:		Arsenic	Lead	Zinc
Performance Standards:		0.012	375	550	Performance Standards:		0.012	375	550
Location	Sample Date				Location	Sample Date			
EM-WL-SED-03	9/23/1998	0.9U	5.9	23	EM-WL-SED-04	9/23/1998	3.1 *	33	44
	12/17/1998	1.1 *	15	22		12/17/1998	4.2 *	32	37
	3/19/1999	1.9 J *	15	40 J		3/19/1999	3.1 J *	30	53 J
	6/16/1999	1.6 *	12	33		6/16/1999	1.7 *	11	26
	9/22/1999	1.3 *	10	13		9/22/1999	3.6 *	30	37
	12/14/1999	3.7 *	11	74		12/14/1999	1.4 *	4.3	27
	3/14/2000	2.8 *	9	150		3/14/2000	1.6 *	8.0	46
	6/14/2000	4.4 *	38	100		6/14/2000	1.6 *	4.3	38
	12/22/2000	4.2 *	40	98		12/22/2000	8.1 *	110	270
	6/5/2001	5.8 *	54	150		6/5/2001	10 *	360	720 *
	12/12/2001	5.9 *	39	120		12/12/2001	6.7 *	150	270
	6/19/2002	2.7 *	19	39		6/19/2002	12 *	100	590 *
	12/4/2002	7.6 *	55	64		12/4/2002	6.8 *	73	540
	6/18/2003	6.8 *	52	91		6/18/2003	8.8 *	95	360
	6/23/2004	na	na	14		6/23/2004	na	86 J	440
				6/24/2005	na	na	600 *		
				6/20/2006	na	na	700 *		
				6/27/2007	na	na	630 *		

NOTES: (1) U - not detected, J - estimated, * - exceeds cleanup level, na - not analyzed

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Appendix G

Applicable or Relevant and Appropriate Requirements (ARARs)

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**PSC Resources Superfund Site
Applicable or Relevant and Appropriate Requirements (ARARs)**

Medium/ Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR	Change affecting protectiveness
Groundwater/ SDWA	Federal - SDWA - Maximum Contaminant Levels (MCLs) (40 CFR Part 141.11-141.16) and non-zero Maximum Contaminant Level Goals (MCLGs)	Relevant and Appropriate	Standards (MCLs) have been adopted as enforceable standards for public drinking water systems: goals (MCLGs) are non-enforceable levels for such systems.	Remediation of contaminated material in soils and sediment will eliminate ongoing discharges of contaminants to groundwater. MCLs and non-zero MCLGs will be attained in groundwater at the point of compliance.	No

**PSC Resources Superfund Site
Applicable or Relevant and Appropriate Requirements (ARARs) - Continued**

Medium/ Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR	Change affecting protectiveness
Surface Water/CWA	Federal - 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. CERCLA §121(d)(2) requires compliance with such guidelines when they are relevant and appropriate. A more stringent AWQC for aquatic life may be found relevant and appropriate rather than an MCL, when protection of aquatic organisms is being considered at a site. Federal AWQC are health-based criteria which have been developed for 95 carcinogenic compounds; these criteria consider exposure to chemicals from drinking water and/or fish consumption. Acute and chronic exposure levels are established.	The selected remedy will attain AWQC in the wetland surface waters and river water after completion of remedial activities.	No
Groundwater/ SDWA	State - 310 CMR 22.06 Maximum Contaminant Levels for Inorganic Chemicals in Drinking Water	Relevant and Appropriate	Maximum contaminant levels are established for inorganic chemical contaminants under 310 CMR 22.06. All public water systems must comply with the levels of inorganic contaminants which are listed in Table 1 of 310 CMR 22.06.	The selected remedy will attain State MCLs for inorganics in the groundwater at the point of compliance.	No

**PSC Resources Superfund Site
Applicable or Relevant and Appropriate Requirements (ARARs) - *Continued***

Medium/ Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR	Change affecting protectiveness
Groundwater/ SDWA	State - 310 CMR 22.07 Maximum Organic Chemical Contaminant Levels in Drinking Water	Relevant and Appropriate	310 CMR 22.07 establishes maximum contaminant levels for selected chlorinated hydrocarbons, pesticides and herbicides.	The selected remedy will attain State MCLs for organic contaminants in the groundwater at the point of compliance.	No

**PSC Resources Superfund Site
Applicable or Relevant and Appropriate Requirements (ARARs) - *Continued***

Medium/ Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR	Change affecting protectiveness
Groundwater/ CWA	Federal - (Guidance) Groundwater Classification Guidelines	To be Considered	<p>Classifies groundwater by its potential beneficial uses such as special groundwater (Class 1) which is “highly vulnerable to contamination because of the hydrological characteristics of the areas in which it occurs and characterized by either of the following factors:</p> <ul style="list-style-type: none"> - The groundwater is irreplaceable; no reasonable alternative source of drinking water is available to substantial populations. - The groundwater is ecologically vital; the aquifer provides the base flow for a particularly sensitive ecological system that, if polluted, would destroy a unique habitat. <p>Class 2 groundwater is classified as a current and potential source of drinking water and waters having other beneficial uses. All groundwater which does not fit under Class 1 and which is not heavily saline (total dissolved solids (TDS) > 10,000 mg/l) are considered Class 2 groundwater.</p>	The groundwater aquifer will meet the standards under the SDWA for the appropriate classification of groundwater after completion of remedial activities.	No

**PSC Resources Superfund Site
Applicable or Relevant and Appropriate Requirements (ARARs) - *Continued***

Medium/ Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR	Change affecting protectiveness
Sediments/ CWA	Federal - NOAA Technical Memorandum NOS OMA 52	To be Considered	The memorandum identifies reference doses for various contaminants in sediments and their potential biological effects on biota exposed to the contaminants.	Contaminated sediments will be remediated.	No
Wetlands/ CWA	Federal - CWA Section 404(b)(1); 40 CFR Part 230, 33 CFR Parts 320 - 330	Applicable	Requirements under these codes prohibit the discharge of dredged or fill material into wetlands unless those actions comply with the substantive requirements which are identified under these regulations.	Discharges to wetlands around the site will comply with these requirements.	No
Wetlands/ CWA	Federal Executive Orders 11990 Protection of Wetlands	Applicable	Under this regulation, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands.	Wetlands protection considerations will be incorporated into the planning and implementation of this selected remedy.	No

**PSC Resources Superfund Site
Applicable or Relevant and Appropriate Requirements (ARARs) - *Continued***

Medium/ Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR	Change affecting protectiveness
Floodplains/ RCRA	Federal 40 CFR Part 264.18 Location Standards	Relevant and Appropriate	<p>This regulation identifies geological features that a proposed location for a RCRA hazardous waste treatment and/or disposal facility must avoid. Three specific geological features are identified of which two apply to the site. These features and the significance are:</p> <ul style="list-style-type: none"> - Floodplain - A facility located in a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste unless the owner or operator can demonstrate to the EPA Regional Administrator that he can meet the criteria established under this subpart which exempts him from complying with this requirement. 	This site is located within a 100-year floodplain and a portion of the site may be within 200 feet of a fault. On-site remediation activities will comply with the requirements of 40 CFR Parts 264.18(a) and (b).	No

**PSC Resources Superfund Site
Applicable or Relevant and Appropriate Requirements (ARARs) - Continued**

Medium/ Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR	Change affecting protectiveness
Rivers/CWA	Federal - 16 USC 661 et. seq. Fish and Wildlife Coordination Act	Applicable	Mitigative actions must be taken to minimize potential adverse impacts to natural sources such as wetlands. Restoration of damaged natural features are required.	Relevant federal agencies will be contacted to help analyze impacts of the implementation of remedial alternatives on wildlife in wetlands and rivers. Restoration of impacted wetlands will occur once all excavation and stabilization activities are completed.	No
Wetlands/ CWA	State - Department of Environmental Protection - Wetlands Protection (310 CMR 10.00)	Applicable	These regulations are promulgated under Wetlands Protection Laws, which regulate dredging, filling, altering or polluting inland wetlands. Work within 100 feet of a wetland is regulated under this requirement. The requirement also defines wetlands based on vegetation types and requires that effects on wetlands be mitigated.	The selected remedy will include measures to mitigate and/or replace loss of habitat or hydraulic capacity in accordance with 310 CMR 10.00.	No