

Superfund Records Center

SITE: Yaworski Waste Lagoon

BREAK: 8.3

OTHER: 546688

**FOURTH FIVE-YEAR REVIEW REPORT FOR
YAWORSKI WASTE LAGOON SUPERFUND SITE
TOWN OF CANTERBURY
WINDHAM COUNTY, CONNECTICUT**



Prepared by

**U.S. Environmental Protection Agency
Region I
Boston, Massachusetts**

September 2013

Approved by:

Date:


James T. Owens, III, Director
Office of Site Remediation and Restoration
U.S. Environmental Protection Agency – New England

9/3/13



SDMS DocID

546688

TABLE OF CONTENTS

List of Acronyms and Abbreviations.....	iii
Executive Summary.....	iv
Five-Year Review Summary Form.....	vi
1.0 Introduction.....	1
2.0 Site Chronology.....	2
3.0 Background.....	5
4.0 Remedial Actions.....	7
5.0 Progress Since Last Five-Year Review.....	16
6.0 Five-Year Review Process.....	22
7.0 Technical Assessment.....	26
8.0 Issues.....	33
9.0 Recommendations and Follow-Up Actions.....	33
10.0 Protectiveness Statements.....	34
11.0 Next Review.....	35

TABLES

Table 1	Trigger Values Developed for 26 Analytes of Concern.....	19
Table 2	Issues.....	33
Table 3	Recommendations and Follow-Up Actions.....	34

ATTACHMENTS

Attachment 1	Site Location Map
Attachment 2	Sampling Locations
Attachment 3	Alternate Concentration Limits Summary Table
Attachment 4	Exceedances of ACLs, PCLs, and Sediment Trigger Values, 2008-2012
Attachment 5	Five-Year Review Site Inspection Checklist
Attachment 6	List of Documents Reviewed
Attachment 7	CT DEEP Comment Letter, dated August 13, 2013

LIST OF ACRONYMS AND ABBREVIATIONS

ACRONYM DEFINITION

ACL	Alternate Concentration Limit
ARARs	Applicable or Relevant and Appropriate Requirements
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System (a Regional database)
CFR	Code of Federal Regulations
CSF	Cancer Slope Factors
CT AG	Connecticut Office of the Attorney General
CT DEEP	Connecticut Department of Energy & Environmental Protection
CT DEP	Connecticut Department of Environmental Protection (name has since changed to the Connecticut Department of Energy & Environmental Protection)
ELUR	Connecticut Environmental Land Use Restriction
EPA	United States Environmental Protection Agency
ER-L	Effects Range-Low, a sediment benchmark
ER-M	Effects Range-Medium, a sediment benchmark
MCLs	Maximum Contaminant Levels
M&E	EPA contractor Metcalf & Eddy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation & Maintenance
OU	Operable Unit
PAHs	Polycyclic Aromatic Hydrocarbons
PCL	Protective Concentration Limit
ppb	parts per billion
PRP	Potentially Responsible Party
RA	Remedial Action
RAOs	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RSRs	Connecticut Remediation Standard Regulations
SLERA	Screening-Level Ecological Risk Assessment
TOC	Total Organic Carbon
VOCs	Volatile Organic Compounds

EXECUTIVE SUMMARY

The remedy selected to address contamination at the Yaworski Waste Lagoon Superfund Site, located in the Town of Canterbury, Windham County, Connecticut, as outlined in the September 29, 1988 Record of Decision, includes:

- construction of a permanent, multi-layer cap over the lagoon, including reinforcement of the earthen dike surrounding the lagoon;
- establishing Alternate Concentration Limits (ACLs) as the groundwater protection standard for the site;
- restriction of groundwater use both within the meander bend of the river and on three properties located across the river from the site; and
- compliance monitoring of groundwater, surface water, and sediment for an estimated period of 30 years.

The site achieved construction completion when the Preliminary Close Out Report was signed on September 20, 2000. On September 28, 2001, the United States Environmental Protection Agency (EPA) determined that the remedy was Operational and Functional, and documented this in an Interim Remedial Action (RA) Report. On September 30, 2011, EPA and the Connecticut Department of Energy & Environmental Protection (CT DEEP) entered into a Memorandum of Agreement in which CT DEEP agreed to continue all Operation & Maintenance (O&M) responsibilities at the site, including compliance monitoring and monitoring and maintenance of the lagoon cap. The Memorandum of Agreement further notes that due to the waste-in-place nature of the remedy, O&M activities may be required indefinitely.

The remedy at the Yaworski Lagoon Superfund Site currently protects human health and the environment in the short-term because: 1) there is no current exposure to contaminated groundwater originating from the site, 2) threats to human health and ecological receptors from site-related contamination are not significant, based on an evaluation of surface water and sediment data, as well as evaluation of groundwater trigger levels for sediment, and 3) the lagoon cap continues to be an effective barrier to exposure to contaminated waste by human and ecological receptors, and CT DEEP continues to perform O&M on the lagoon cap. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: finalize implementation of institutional controls on PRP-owned properties, continued evaluation of cadmium and lead exceedances of groundwater trigger values for sediment, and finalize administrative requirements needed to continue monitoring.

The public is protected from on-site contaminants because a fence and the lagoon cap impede direct access to the lagoon and the wastes contained within the lagoon. The area around the site is generally restricted by locked gates, and the entrances are posted with no trespassing signs. There is no longer any public access to the nearby landfill. Access to the lagoon itself is restricted by a fence and a locked gate, and warning signs are posted on the fence.

EPA and CT DEEP perform ongoing evaluation of all results from compliance monitoring of groundwater, including groundwater trigger levels for sediment. None of the groundwater ACL exceedances over the last five years have warranted further action beyond continued evaluation. ACL exceedances do not represent a risk to human health or the environment since there is no current exposure to contaminated groundwater. EPA and CT DEEP continue to evaluate exceedances of groundwater trigger levels in point of compliance wells for sediment. Human health and ecological review indicate there is no significant risk posed by contamination in surface water and sediment. In addition, EPA determined that PAH levels measured in sediment are not site-related. Monitoring must continue in order for these evaluations to occur, and to ensure that the overall remedy continues to be protective.

Institutional controls are required to prevent groundwater pumping from drawing contamination into uncontaminated areas, and to prevent exposure to contaminants in groundwater. Institutional controls have been implemented on three off-site properties. EPA is working with the State of Connecticut to implement institutional controls required for the Yaworski-owned properties within the meander bend of the river.

The Yaworskis continue to cooperate with the agencies to restrict all use of groundwater and to restrict certain land uses. Because there are no structures or drinking water wells located within or immediately downgradient of contaminated groundwater from the site or the groundwater use restriction zones, there is no risk to human health via ingestion of groundwater or potential vapor intrusion.

While the public is currently protected, formal groundwater use restrictions must be implemented in order to provide long term protection.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name: Yaworski Waste Lagoon Superfund Site

EPA ID: CTD009774969

Region: 1

State: CT

City/County: Canterbury/Windham

SITE STATUS

NPL Status: Final

Multiple OUs? No

Has the site achieved construction completion?

Yes

REVIEW STATUS

Lead Agency: EPA

Author name: Anni Loughlin

Author title: Remedial Project Manager

Author affiliation: U.S. Environmental Protection Agency

Review Period: December 13, 2012 to July 10, 2013

Date of site inspection: April 3, 2013

Type of Review: Statutory

Review number: 4

Triggering action date: 9/29/2008

Due date (five years after triggering action date): 9/29/2013

Five-Year Review Summary Form, continued

The table below is for the purpose of the summary form and associated data entry and does not replace the two tables required in Section VIII and IX by the FYR guidance. Instead, data entry in this section should match information in Section VII and IX of the FYR report.

Issues/Recommendations

Issues and Recommendations Identified in the Five-Year Review:

OU(s): sitewide	Issue Category: Institutional Controls			
	Issue: Institutional controls not implemented on PRP properties.			
	Recommendation: Finalize easements for three properties, secure required subordination agreements, and record easement.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	Yaworskis, EPA, CT DEEP, CT AG	EPA, CT DEEP, and CT AG	09/30/2016
OU(s): sitewide	Issue Category: Monitoring			
	Issue: Continued evaluation required for cadmium and lead exceedances of groundwater trigger values for sediment.			
	Recommendation: Continue monitoring of groundwater at point of compliance wells to determine if cadmium and lead exceedances continue. If exceedances continue, perform sediment sampling.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	CT DEEP & EPA	NA	09/30/2018
OU(s): sitewide	Issue Category: Monitoring			
	Issue: O&M monitoring schedule requires improvement.			
	Recommendation: Finalize administrative requirements needed to continue monitoring.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	CT DEEP	EPA	09/30/2013

Sitewide Protectiveness Statement

Protectiveness Determination: Short-Term Protective

Protectiveness Statement: The remedy at the Yaworski Lagoon Superfund Site currently protects human health and the environment in the short-term because: 1) there is no current exposure to contaminated groundwater originating from the site, 2) threats to human health and ecological receptors from site-related contamination are not significant, based on evaluation surface water and sediment data, as well as evaluation of groundwater trigger levels for sediment and 3) the lagoon cap continues to be an effective barrier to exposure to contaminated waste by human and ecological receptors, and CT DEEP continues to perform O&M on the lagoon cap. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: finalize implementation of institutional controls on PRP-owned properties, continued evaluation of cadmium and lead exceedances of groundwater trigger values for sediment, and finalize administrative requirements needed to continue monitoring.

1.0 INTRODUCTION

The purpose of this five-year review is to determine whether the remedy for the Yaworski Waste Lagoon Superfund Site is protective of human health and the environment. The methods, findings and conclusions of this review are documented in this Five-Year Review Report. In addition, this report identifies any issues found during the preparation of this five-year review along with recommendations to address such issues.

The United States Environmental Protection Agency (EPA) must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121(c), 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. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The agency interpreted this requirement further in 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.

EPA Region I conducted a five-year review of the remedial actions implemented at the Yaworski Waste Lagoon Superfund Site in the Town of Canterbury, Windham County, Connecticut. This review was conducted from December 13, 2012 through July 10, 2013. This report documents the results of the review.

This is the fourth five-year review for the Yaworski Waste Lagoon Superfund Site. The triggering action for this review is the date of the third five-year review, as shown in EPA's CERCLIS database: September 29, 2008. This review is required by statute as the Record of Decision (ROD) was signed after October 17, 1986, the effective date of the Superfund Amendments and Reauthorization Act of 1986, and the remedial action will leave hazardous substances, pollutants, or contaminants on site above levels that allow for unlimited use and unrestricted exposure. The Connecticut Department of Energy & Environmental Protection (CT DEEP) reviewed and provided comments on this document (see Attachment 7). EPA Headquarters' Office of Superfund Remediation and Technology Innovation also reviewed this document.

2.0 SITE CHRONOLOGY

The chronology of the site, including all significant site events and dates, is as follows:

Chronology of Site Events	
Event	Date
Industrial waste disposal on site	1950 to 1973
CT DEP orders environmental assessment of site.	1976 to 1980
Site covered with paper, rags, and rubble.	1982
Proposal to National Priorities List (NPL).	December 30, 1982
Final Listing on NPL.	September 8, 1983
Initial Remedial Investigation/Feasibility Study	1986
Supplemental Remedial Investigation/Feasibility Study	1987 to 1988
Record of Decision (ROD) signed.	September 29, 1988
Consent Decree (CD) with PRPs entered.	February 26, 1990
Potentially Responsible Parties (PRPs) submit lagoon closure plan and Alternate Concentration Limit (ACL) Demonstration Report; EPA disapproves ACL Demonstration Report and requires installation of additional monitoring wells.	May 1990
EPA approves PRP lagoon closure plan.	May 3, 1990
PRPs award contract for lagoon closure.	June 5, 1990
PRPs conduct initial groundwater sampling round for ACL Demonstration.	March 1991
PRP construction documentation report for lagoon cap and dike.	March 1991
EPA approves PRP Post-Closure Work Plan for the lagoon cap and dike.	April 8, 1991
EPA/CT DEP final inspection of lagoon cap and dike.	November 25, 1991
EPA approves PRP's final Remedial Construction Report for lagoon cap and dike.	March 31, 1992
PRPs conduct second round of groundwater monitoring for ACL development; results indicate benzene Maximum Contaminant Level (MCL) exceedance across the river in the intermediate N well (Ni).	October 1992
EPA confirms benzene MCL exceedance across the river; requires PRPs to implement a Corrective Action Program.	February 1993
PRPs submit revised ACL Demonstration Plan.	March 1993
PRPs begin quarterly compliance monitoring of groundwater, surface water and sediment.	March 1993
PRPs submit Corrective Action Work Plan.	June 1993
EPA disapproves PRP Corrective Action Work Plan.	August 1993
PRPs submit revised Corrective Action Work Plan; EPA disapproves.	September 1993
PRPs submit additional revised Corrective Action Work Plan.	October 1993

Pavel Industries, Inc. (lead PRP responsible for all work under the 2/26/1990 CD) notifies EPA that it is financially unable to perform any remaining work at the site.	October 27, 1993
Remaining PRPs agree to finalize Corrective Action Work Plan; EPA submits comments.	September 1995
EPA executes a Stipulation and Order with the site owner/operators ("the Yaworskis"), under which they agree to perform certain activities, including finalizing the Corrective Action Work Plan.	October 20, 1995
Yaworskis' contractor submits significantly revised Corrective Action Work Plan.	March 1996
Two of three off-site landowners accept EPA offers for access and institutional controls.	June 1996
EPA submits comments on revised Corrective Action Work Plan.	July 1996
U.S. enters de minimis-type Consent Agreement with five low-volume generators resolving their liabilities under the 2/26/1990 CD.	July 18, 1996
Yaworskis notify EPA that they are financially unable to perform any remaining work at the site.	October 1996
U.S. files a complaint against Pavel Industries, Inc. and its parent company, the Bemis Company.	December 2, 1996
EPA assumes all responsibility to perform further response actions at the site, with the exception of operation and maintenance (O&M) activities on the lagoon cap which are to be performed by the State of Connecticut. EPA contractor Metcalf & Eddy (M&E) begins compliance monitoring activities.	December 1996
CT DEP begins O&M activities for lagoon cap and dike.	March 1997
EPA finalizes Corrective Action Work Plan; M&E begins on-site field activities to investigate the nature and extent of the benzene exceedance at well Ni.	June 1998
First five-year review; EPA certifies that the remedy remains protective of human health and the environment.	September 29, 1998
EPA increases offers to three off-site landowners for access and institutional controls based on revised appraisals; two of three landowners accept.	January 1999
U.S. files a complaint against the Yaworskis.	April 7, 1999
EPA human health and ecological risk screening evaluations for surface water and sediment data.	December 1999
EPA approves the final Pre-Design Engineering Report on the benzene exceedance at well Ni; monitored natural attenuation is selected as the corrective action measure.	December 1999
EPA approves the Final ACL Demonstration Report, formalizing the methodology by which ACLs will be set.	December 30, 1999
U.S. enters CD with Pavel Industries, Inc. and the	August 11, 2000

Bemis Company formalizing settlement resulting in a final cash-out of \$3,000,000.	
EPA/CT DEP perform final site-wide inspection for construction completion determination.	August 23, 2000
EPA approves 279 final ACLs for point of compliance wells.	September 18, 2000
EPA approves Preliminary Close-Out Report documenting completion of Remedial Action (RA) construction; start of one-year Operational & Functional period.	September 20, 2000
U.S. enters CD with the Yaworskis formalizing settlement resulting in a final cash-out of \$1,425,000.	September 25, 2000
EPA approves Interim RA Report documenting that all necessary RA construction is complete and the start of the Long-Term Remedial Action phase.	September 28, 2001
Second five-year review; EPA certifies that the remedy remains protective of human health and the environment.	September 30, 2003
EPA implements modifications to sediment sampling program based on ecological risk evaluation and trend analysis of concentrations of polycyclic aromatic hydrocarbons (PAHs).	October 2004
EPA implements additional modifications to sediment and surface water sampling program based on PAH detections.	September 2006
EPA, CT DEP and Army Corps of Engineers (ACOE) met with off-site landowners to initiate new appraisals and survey maps for access and groundwater use restrictions.	November 13, 2007
Third five-year review; EPA certifies that the remedy remains protective of human health and the environment.	September 29, 2008
EPA screening-level human health risk assessment concludes recreational exposure to potential contaminants in surface water and sediment do not exceed acceptable levels.	March 24, 2009
EPA determination that the lagoon is not the source of PAHs in the Quinebaug River.	May 4, 2009
Environmental Land Use Restrictions (ELURs) providing access and institutional controls recorded for two properties and an easement providing for access recorded for a third property across the Quinebaug River.	August 10, 2010
ELUR providing access and institutional controls recorded for fourth property across the Quinebaug River.	January 4, 2011
EPA memo outlining final long-term monitoring plan to assess ecological risk in sediments; termination of all surface water sampling.	January 26, 2011

CT DEEP takes over all operation & maintenance activities, including compliance monitoring.	September 30, 2011
Public notice regarding start of Fourth Five-Year Review published in the <i>Norwich Bulletin</i> .	January 4, 2013
EPA and CT DEEP conduct site inspection	April 3, 2013

3.0 BACKGROUND

Physical Characteristics.

The Yaworski Waste Lagoon Superfund Site (aka the Yaworski Lagoon Superfund Site) is located on approximately five acres of land between Route 169 and Packer Road in the Town of Canterbury, Windham County, Connecticut. The site is bordered by the Quinebaug River on the north, west, and south, and by Packer Road to the east.

The lagoon is located within a meander loop on the floodplain of the Quinebaug River. The site is a dewatered and backfilled lagoon, and measures approximately 700 feet by 300 feet. Open fields that were once used for the production of silage corn are to the east and south of the lagoon. Approximately 2000 feet southeast of the lagoon is a municipal solid waste landfill. Wetland and wet areas are located along the riverbank south of the lagoon.

Groundwater flow from the site discharges to the Quinebaug River, primarily to the south, downgradient of the lagoon. The nearest residents are located across the Quinebaug River, to the north, west, and south. Residential homes are also located along Packer Road to the east.

Figures provided in Attachment 1 and Attachment 2 to this report, show the general location of the site and a more detailed map of the area.

Land and Resource Use.

The lagoon was operated from 1950 to 1973, and is currently inactive. The parcel is privately owned by the Yaworski family. (No reuse is currently planned for the site.)

The abutting parcel to the east is also owned by the Yaworskis. A municipal solid waste landfill, the Packer Road (Yaworski) Landfill (EPA ID Number CTD981204431), is located on this parcel, but is not part of the Superfund site. The landfill accepted solid waste until early 1995. The landfill is regulated under state authority. The Connecticut Department of Energy & Environmental Protection maintains the area as necessary and will ultimately authorize closure activities for the landfill. A transfer station is located on an adjacent parcel, but is currently unused, except as a lay-down area for construction of a nearby biomass facility.

The current land use for other surrounding areas is mainly residential. The Quinebaug River is used for recreational purposes, such as canoeing. The landfill abuts the river both upgradient and downgradient of the lagoon.

Residential homes near the site obtain their drinking water from private residential wells. Residential homes along Packer Road are not impacted by the lagoon. No residential wells located downgradient of the site have been impacted by contaminants emanating from the lagoon.

History of Contamination.

From 1950 to 1973, industrial wastes, including solvents, paints, textile dyes, acids, resins, and various other debris, were dumped into the lagoon. Flammable waste was periodically burned at the site until 1965 when the Connecticut Department of Health ordered a halt to on-site burning of waste. The combined efforts of local residents, and state and local officials led to the end of all dumping at the site in 1973.

In 1976, the Connecticut Department of Environmental Protection (CT DEP, which has since changed its name to the Connecticut Department of Energy & Environmental Protection, or CT DEEP) ordered the site owner, James Yaworski, Sr., to assess the environmental hazard posed by the site. Mr. Yaworski was required to install monitoring wells adjacent to the lagoon, which detected contaminated groundwater. In 1980, CT DEP ordered Mr. Yaworski to employ a professional engineering firm to conduct an environmental study of the property. The firm concluded that most of the contaminants had migrated from the abandoned lagoon and recommended capping the area. In response to an order by CT DEP in 1982, Mr. Yaworski covered the site with paper, rags, rubble and soil.

Initial Response.

After a fire occurred at the site in 1982, EPA decided that additional information was needed about the site to better assess the potential threat to human health and the environment. EPA proposed the site to the National Priorities List (NPL) on December 30, 1982 (47 FR 58476) and added it to the final list on September 8, 1983 (48 FR 40658).

The initial Remedial Investigation (RI), completed in April 1986, concluded that several areas needed further study before a cleanup decision could be made. A Supplemental RI and Feasibility Study were completed in 1987 and 1988. The lagoon was found to contain approximately 65,000 cubic yards of highly contaminated sludge, a mixture of water, dirt, volatile organic compounds (VOCs), semi-VOCs, and heavy metals. Organic compounds included 2-butanone, toluene, total xylenes, and bis(2-ethylhexyl)phthalate. Heavy metals included arsenic, chromium, lead and mercury. Further, the sludge was covered by an additional 60,000 cubic yards of contaminated debris, consisting of dirt, rags, trash, and construction materials, and saturated with contaminated water perched above the sludge.

On September 29, 1988, the Regional Administrator signed a Record of Decision (ROD), for which the State of Connecticut concurred. An initial Consent Decree (CD) with 11 Settling Defendants was entered in the United States District Court, District of Connecticut on February 26, 1990.

No activities were conducted using removal authority at this site.

Basis for Taking Action.

The ROD concluded that potential threats to human health and the environment could primarily occur via physical contact with wastes, exposure to contaminated soils, sediments and groundwater, and discharge of contaminants to surface water, sediments, and the nearby wetland.

The ROD stated that dermal contact with contaminated leachate and sediments would pose an incremental lifetime cancer risk, and although contaminated groundwater was not being consumed at the time, ingestion of groundwater would result in risks that exceed EPA's cancer risks target and exceed acceptable reference doses for exposure to non-carcinogens. Concentrations of heavy metals in the wetland due to leachate flow from the lagoon and erosion of contaminated sediments also exceeded chronic and acute Ambient Water Quality Criteria and ecotoxicity criteria.

4.0 REMEDIAL ACTIONS

Remedy Selection.

Remedial action objectives for the site included the following:

- minimize exposure to contaminated groundwater;
- ensure that contamination from the lagoon does not adversely impact the Quinebaug River;
- protect environmental receptors in the wetlands;
- minimize exposure to contaminated leachate seeps; and
- attain Applicable or Relevant and Appropriate Requirements (ARARs).

As outlined in the September 29, 1988 ROD, the selected remedy for the site included:

- construction of a permanent, multi-layer cap over the lagoon, including reinforcement of the earthen dike surrounding the lagoon;
- establishing ACLs as the groundwater protection standard for the site;
- restriction of groundwater use both within the meander bend of the river and on three properties located across the river from the site; and
- compliance monitoring of groundwater, surface water, and sediment for an estimated period of 30 years.

An ACL establishes a numerical limit on the amount of contamination that can exist in groundwater at the point of compliance (POC) without endangering human health and the environment where receptors are potentially exposed. In the event ACLs are exceeded, or if certain other conditions are not met, the ROD provides for the development of a corrective action contingency plan, to include the installation and operation of a groundwater extraction and treatment system or other necessary action. The other conditions that must be maintained, and restored if necessary, are outlined in the ROD and the CD as follows:

1. ACLs shall not be exceeded at the POC monitoring wells located immediately adjacent to the lagoon, well clusters B, C, and G (see Attachment 2).
2. At the point of exposure (the Quinebaug River), the concentration of hazardous constituents shall not pose a risk to human health and the environment.
3. The Quinebaug River shall be maintained as a hydraulic barrier to contaminated groundwater (that is, preventing contamination from crossing to the opposite side of the river). This condition is measured by ensuring Maximum Contaminant Levels (MCLs) are not exceeded in groundwater across the river from the lagoon.
4. The Quinebaug River shall not be adversely impacted by the discharge of contaminants into it.

These conditions, as outlined in the ROD and CD, relate only to site-related contamination, and not to contaminants that are generated from a source other than the Yaworski Lagoon Superfund Site.

Remedy Implementation and Operation and Maintenance.

Note: due to the unusual situations that required a change from PRP-lead to Fund-lead performance of work, a section has been added to this report documenting enforcement history.

EPA approved the Potentially Responsible Parties' (PRPs) lagoon closure plan on May 3, 1990. The PRPs awarded the contract on June 5, 1990 and construction began shortly thereafter on the lagoon cap and dike. Most construction was completed by late 1990. The PRPs submitted a construction documentation report in March 1991 outlining remaining items: establish a vegetative cover, repair erosion and re-grade an area on the lagoon surface, fill holes beneath the chain link fence, and fill several small depressions at the base of the gabion wall. EPA and the State conducted a final inspection on November 25, 1991, and EPA approved the final Remedial Construction Report for the lagoon cap and dike on March 31, 1992.

EPA approved the Post Closure Work Plan for the lagoon cap on April 8, 1991. Monthly inspections and ongoing maintenance were performed by PRP contractors and employees from 1992 through December of 1996. In December 1996, the site changed from PRP-lead to Fund-lead (see "Enforcement History"), and as part of that decision, it was determined that the cap portion of the remedy was essentially in the Operation and

Maintenance (O&M) phase. CT DEP agreed to take over 100% of this work, and has been performing all maintenance activities since March 1997, including regular inspections of the cap and fence, mowing the site approximately twice per year or as needed, tree and brush removal, repairs to the fence and cap, and re-seeding as needed. EPA and CT DEP conducted a final site-wide inspection on August 23, 2000 and confirmed that there was no need for additional work or construction for the lagoon cap beyond these ongoing O&M activities.

The second portion of the remedy consists of establishing ACLs as the groundwater protection standard and monitoring groundwater, surface water, and sediment for an estimated period of 30 years. EPA disapproved the PRP's first ACL Demonstration Report submitted in May 1990. Lack of adequate groundwater characterization required the installation of additional monitoring wells in 1990 and 1991. An initial groundwater sampling round was conducted in March 1991 to determine which compounds would be included on the ACL list. During discussions with the PRPs, EPA decided that another round of groundwater data was necessary to update site conditions, and the PRPs collected another round of data in October 1992. EPA contractors conducted split sampling for each round.

After multiple submittals and extensive discussions, EPA, CT DEP and the PRPs finalized the methodology by which ACLs would be set at the site for a specific set of compounds. It was determined that two years of monitoring data would be collected, and the PRPs would conduct a statistical analysis to determine the appropriate ACLs.

Data collected during October 1992, however, indicated an MCL exceedance for benzene across the river from the lagoon at the intermediate well at monitoring well cluster N (well Ni). The ROD and CD condition requiring the Quinebaug River act as a hydraulic barrier to contaminated groundwater flow was not being met, as evidenced by the MCL exceedance across the river. EPA technical and legal staff evaluated the benzene MCL exceedance along with all other site conditions and determined that the levels did not pose an imminent threat, and did not warrant a change in the remedy outlined in the 1988 ROD. The potential exposure to the benzene exceedance exists through ingestion of groundwater only, and there are no known drinking water wells immediately downgradient of the benzene exceedance. (Benzene has never been detected in the shallow well at monitoring well cluster N.) EPA determined in February 1993 that MCLs on the other side of the river were indeed being exceeded for benzene and that the river was not being maintained as a hydraulic barrier. As a result, the PRPs began implementing a Corrective Action Program as outlined in the 1988 ROD and 1990 CD.

Soon after the PRPs began implementing a Corrective Action program, they submitted a revised ACL Demonstration Plan (March 1993), and began quarterly compliance monitoring to start collecting data to set ACLs, and to ensure protection of human health and the environment. The PRPs conducted human health and ecological risk assessments as part of the ACL determination, and these assessments generated Protective Concentration Limits (PCLs) for surface water, sediments, and pore water. Surface water and sediment are sampled at five locations in the river, including points upgradient,

adjacent, and downgradient of the site. Pore water is sampled at four well points located in the river. Exceedances of PCLs for any specific contaminant at any one location trigger an evaluation of this contaminant in the surrounding area to determine if the contaminants are site-related. (To date, although there have been PCL exceedances in all media, EPA evaluations determined in each case that remedial action was not warranted.)

In early 1993, pursuant to the Corrective Action Work Plan, the PRPs submitted work plans for Pre-Design activities to confirm that the benzene exceedances at well Ni were site-related, investigate the nature and extent of the exceedance, and determine what measures, if any, were necessary to prevent plume migration beyond well Ni and restore groundwater across the river to below MCLs. None of the PRP work plans were finalized due to numerous changes in the status of the PRPs (see "Enforcement History"). While the PRPs also updated the ACL Demonstration Report in 1995 and 1996, the report was not finalized before all PRPs defaulted from the site.

Quarterly monitoring confirmed that the benzene continued to be exceeded at well Ni at levels ranging from 8 parts per billion (ppb) to 23 ppb. The MCL for benzene is 5 ppb. In December of 1996, EPA and the State of Connecticut took over all work at the site; EPA's contractor Metcalf & Eddy (M&E) began performing all site-wide compliance monitoring at that time, and the State of Connecticut took over all O&M work on the lagoon cap.

In 1998, M&E began working on Pre-Design activities as part of the Corrective Action Program. Field investigations, consisting largely of the collection and analysis of groundwater samples from temporary small-diameter wells at 41 locations, were completed in September 1998. Additional hydraulic conductivity testing and supplementary groundwater sampling and analysis of monitoring wells were also conducted, as well as groundwater modeling. The data strongly suggests that there are two volatile organic compound plumes, one from the lagoon and the other from the Packer Road Landfill which is not part of the Superfund site. The relative proportions of various compounds differ between the two plumes, and data also indicates that the plumes are separate and distinct in the area investigated. Although both plumes appear to have migrated beneath the river, data suggest that both plumes currently extend only a short distance beyond the river. CT DEEP continues to be alerted of the presence of the plume that appears to be emanating from the State-regulated Landfill. This five-year review report does not evaluate the landfill plume; the remedy for the Yaworski Lagoon Superfund site is not designed to address exceedances from other sources.

To address the benzene exceedance, the Corrective Action study evaluated several remedial alternatives, including in-situ oxygen enhancement, in-well air stripping, containment walls, pump-and-treat technologies, and monitored natural attenuation, among others, as methods to reduce benzene concentrations in groundwater to or below the MCL of 5 ppb. A preliminary evaluation of natural attenuation of the lagoon VOC plume indicated that biodegradation is most likely playing a significant role in natural attenuation processes at the site, and that current subsurface conditions are favorable to

continued attenuation. The time frame for benzene concentrations to decrease to the MCL at the impacted well was estimated at approximately 8 to 10 years based on the conditions at the time of the report.

Given the above, monitored natural attenuation was selected as the best corrective action to address the benzene exceedance. EPA determined that an engineered remedy to reduce benzene concentrations in the area of well Ni is unwarranted for several reasons:

- the expected decrease in contamination by natural attenuation in approximately 8 to 10 years;
- the limited migration of the plume beyond the currently impacted well;
- the absence of drinking water wells in the vicinity of the plume;
- the apparent stability of site conditions based on over 8 years of monitoring results;
- the technical difficulty of implementing alternative engineered measures for limited expected success;
- no other contaminants have been detected across the river above the MCL; and
- the planned restriction on groundwater use in the area to prevent off-site pumping from further affecting movement of the contaminants.

EPA, in conjunction with CT DEP, approved the final Pre-Design Engineering Report on December 30, 1999. The groundwater monitoring program was modified as of calendar year 2000 to include measurements to determine changes in the configuration of the lagoon plume, and ongoing evaluation of the effectiveness of natural attenuation. EPA issued a fact sheet in April 2000 explaining its choice of natural attenuation as the corrective action measure to address the benzene exceedance. This is consistent with the 1988 ROD which provides for additional contingency remedies as necessary if conditions arise.

In 1999, EPA also conducted human health and ecological risk screening evaluations based on surface water and sediment data collected from the Quinebaug River since 1993. EPA found that contact with river water and sediments poses an insignificant health risk to humans. The screening-level ecological risk assessment concluded that only a few of the analytes of concern were detected at levels that could be contributing to any potential risk.

On December 30, 1999, as a result of the Pre-Design work and risk screening evaluations, EPA was able to approve the Final ACL Demonstration Report, formalizing the methodology by which ACLs will be set. M&E conducted statistical analyses with data collected during the fall 1992 monitoring round, as well as data collected since March 1993 in the first 28 quarters of compliance monitoring. An ACL was established for 31 different contaminants at three POC well clusters, each having a shallow, intermediate, and deep well, totaling 279 individual ACLs. (See Attachment 3.) Each ACL establishes a numerical limit on the amount of contamination that can exist in groundwater at the point of compliance (POC wells adjacent to the lagoon) without endangering human health or the environment where receptors are potentially exposed.

Receptors at this site can be exposed where contamination emanating from the lagoon reaches the Quinebaug River (measured by PCLs in surface water, sediment, and pore water).

EPA approved the final ACLs on September 18, 2000. Approval of ACLs effectively constituted the completion of RA construction at this site, and the start of a one year Operational & Functional period. EPA approved a Preliminary Close-Out Report for this site on September 20, 2000, formalizing the completion of all construction activities.

The groundwater monitoring program was tailored in calendar year 2000 to include monitoring for ACL exceedances at the POC well locations. The groundwater monitoring schedule was also modified to include measurements to determine changes in the configuration of the lagoon plume, and ongoing evaluation of the effectiveness of natural attenuation to address the benzene exceedance at well Ni. Further, the groundwater monitoring schedule was reduced from quarterly to three times a year (generally in the months of April, July, and October).

The second and third five-year review reports of 2003 and 2008 noted that benzene exceedances had generally decreased since calendar year 2000 from a previous high of 23 ppb. The last detection of a benzene MCL exceedance occurred in April 2006 with a detection of 5.6 ppb. Since then, benzene at well Ni has been detected below the MCL of 5 ppb or not detected. (Note that the N well cluster was not sampled between April 2008 and July 2010 due to access issues.)

As of calendar year 2000, the monitoring program for surface water and sediments was also tailored to monitor for fewer specific compounds identified in the screening-level ecological risk assessment that could be contributing towards any potential risk. Of particular concern at the time were widespread detections of polycyclic aromatic hydrocarbons (PAHs) in sediment. PAHs had been detected at all sampling locations, including upgradient locations, and it was unclear if the contamination was related to the Superfund site. Sediment sampling was limited to an annual event for a limited number of compounds, including PAHs and certain inorganics. Beginning in 2000, detections of PAHs and metals in sediment were compared to PCLs, as well as commonly used sediment benchmarks of Effects Range-Low (ER-L) and Effects Range-Median (ER-M) values to aid with ongoing ecological review of sediment results. Surface water sampling was reduced to once every five years for certain inorganics only.

As noted previously, based on a 1999 human health risk screening evaluations of surface water and sediment data collected from the Quinebaug River since 1993, EPA found that contact with river water and sediments poses an insignificant health risk to humans. Since that time, sampling at points of exposure (surface water and sediments) has not been required for the purposes of evaluating risk to human health. For the third five-year review, EPA reviewed sediment results for PAHs and concluded that, although the levels of PAHs in sediments had risen, these levels are unlikely to pose a significant risk to human health from potential incidental ingestion of and dermal contact with PAHs.

Based on subsequent ecological risk reviews of the site and all available sediment data, in October 2004, EPA incorporated further changes to the sediment sampling plan in order to evaluate the source of PAHs and inorganics in sediment and further assess ecological risk. EPA's ecological risk assessor worked with EPA's contractor during sample collection to find appropriate depositional areas from which to collect these samples. Total organic carbon (TOC) samples were also collected to help assess the PAH levels.

After reviewing the October 2004 data, EPA preliminarily concluded that the Yaworski Lagoon Superfund Site and the Packer Road Landfill were not the source of PAHs in river sediment, based in part on PAH detection at upstream locations. There were no concentrations observed at or over the ER-L benchmarks for inorganics.

At the time, EPA determined that sediment sampling should continue, but only once every two years unless data indicates the need for increased frequency in order to assess ecological risk. Additional modifications to the sediment sampling program were implemented in advance of the November 2006 sediment sampling round, including changes to transect locations and the compositing of sediment samples at each of four transect locations. A new transect location was established approximately 1,200 feet upstream from the Packer Road Landfill to measure background levels of PAHs not associated with past or current releases from either the landfill or the lagoon. Sediment samples were analyzed for PAHs and TOC only.

Results of sediment sampling from November 2006 showed PAHs over their ER-L benchmarks at three of four sampling locations, one of which was upstream of both the lagoon and the landfill. In addition, there were two observations of contaminants over their ER-M benchmarks, both at the upstream sampling location. There were no PCL exceedances at any location.

The upstream sediment sample locations were added because EPA suspected that the PAHs may not originate from the lagoon or the landfill. PAHs are not generally known to readily migrate in groundwater, and historical groundwater monitoring data indicate only sporadic detections of one or two PAHs at very low concentrations. There is no evidence of a clear surface run-off or groundwater transport mechanism for PAHs to travel from the lagoon to the river. A trend analysis on the sediment data collected from 1999 through 2006 showed that the PAH levels measured upstream, across, and downstream of the former lagoon most likely reflected regional background concentrations.

The last component of the remedy is institutional controls. Groundwater use must be prohibited within 100 feet outside of the river to the north, west and south, and production wells greater than 50 gallons per minute are prohibited within 1500 feet downgradient of the site. These restrictions affect three properties across the river from the lagoon owned by non-PRP landowners, and access requirements affect a fourth such property. Although monitoring wells were installed on the three properties neighboring the site, and compliance monitoring has taken place since March 1993, the landowners and PRPs did not reach a formal agreement for access and groundwater use restrictions.

EPA received approval from Headquarters to directly pay the landowners for access and groundwater use restrictions, and ultimately arranged for the U.S. Army Corps of Engineers to perform appraisals and conduct appropriate surveys on the properties. Between August 2010 and January 2011, Environmental Land Use Restrictions (ELURs) were recorded on the three properties requiring groundwater use restrictions, and an easement was recorded on the fourth property requiring access.

Restrictions prohibiting any groundwater use are also required on the property within the meander bend of the river, as well as restriction of any use of the property that would interfere with or adversely affect or impact the protectiveness of the remedy. The site owner/operators (“the Yaworskis”) agreed to these restrictions pursuant to the February 26, 1990 CD. As part of the September 25, 2000 settlement with the Yaworskis, the CD requires the Yaworskis to additionally execute and record in the deed an easement granting the right to enforce the land and water use restrictions. In 2008, the agencies determined that easements, rather than Environmental Land Use Restrictions, were appropriate for three separate properties owned by Yaworski-related entities. Easement language has been drafted by EPA and the State of Connecticut.

Enforcement History.

EPA entered into a 1990 Consent Decree (CD) with 11 Settling Defendants: Pervel Industries, Inc. (“Pervel”), generator of over 90% of the waste disposed in the lagoon; three settling parties that can collectively be referred to as the Yaworskis, owner/operators of the lagoon; five small generators, who collectively disposed of less than 3% of the waste in the lagoon; and two companies which are now bankrupt or defunct. The CD designated Pervel as responsible for performance of all work, and provided that the remaining parties would be liable for the work should Pervel become unable to perform.

Pervel's consultant, ENSR Consulting and Engineering (“ENSR”), began performing most of the requirements, including developing ACLs and all corrective action requirements. Pervel also financed construction of the lagoon cap in 1990 to 1991. The Yaworskis' consultant, Fuss & O'Neill, Inc., began performing the required compliance monitoring and related work in March 1993.

In late October 1993, after ENSR had submitted a number of draft Work Plans for Pre-Design activities related to the benzene exceedance, Pervel notified EPA that it was financially unable to perform the remaining work at the site and ENSR subsequently ceased ongoing site work. In accordance with the CD, EPA notified the remaining parties (the five small generators and the Yaworskis) that Pervel was unable to perform and that they were responsible for performing the remainder of the work at the site.

Subsequently, EPA and the five low volume generators entered into an agreement resolving their liabilities under the 1990 CD for the remaining work at the site, for payment of a sum certain. That agreement, memorialized in a de minimis-type Consent

Agreement, was entered in court in July 1996, and resulted in a financial settlement of \$310,903, plus interest, which was placed in a site-specific Special Account.

The Yaworskis' contractor continued to conduct quarterly compliance monitoring after Pervel ceased site work. EPA negotiated an agreement with the Yaworskis, finalized September 1995 and filed in court October 1995, in which the Yaworskis agreed to finalize the ACL Demonstration Report and calculate final ACLs, conduct Pre-Design investigations, and continue quarterly compliance monitoring until Pre-Design investigations were complete. Through a side agreement among the PRPs, ENSR submitted revisions to the ACL Demonstration Plan in 1995 and 1996. The Yaworskis' contractor developed a work plan for Pre-Design investigations in 1996, but this work plan was never finalized; in October of 1996, the Yaworskis notified EPA that they could no longer continue financing any cleanup activities at the site and all PRP site work ended.

EPA formally notified the Yaworskis and the other Settling Defendants in December 1996 of Fund takeover of all site work, except for O&M of the lagoon cap, which the State of Connecticut agreed to perform.

On December 2, 1996, the United States filed a complaint against Pervel and its parent company, the Bemis Company ("Bemis"). After protracted litigation, the parties entered into mediation and achieved a settlement resulting in a final cash-out of three million dollars (\$3,000,000), to be placed in a site-specific Special Account to be used, as necessary, for future response action at or near the site. The CD formalizing this settlement was entered in court on August 11, 2000.

On April 7, 1999, the United States filed a complaint against the Yaworskis. In October 1999, the United States entered into mediation with a judge of the Connecticut Superior Court and various parties regarding (a) the U.S. lawsuit regarding the Superfund site, (b) litigation brought by the State of Connecticut relating to the Yaworski Lagoon Superfund Site and the adjacent Yaworski-owned and Connecticut-regulated Packer Road Landfill, (c) a suit brought by a citizen's group, Peoples Rights in a Clean Environment ("PRICE"), relating to the State-regulated landfill, and (d) back taxes owed to Connecticut, and other remaining obligations of the Yaworskis. The U.S., Connecticut, PRICE, the Yaworskis, and various Yaworski-related entities achieved global settlement of all suits through mediation. The United States' ability-to-pay-based settlement with the Yaworskis and Yaworski-related entities in the amount of \$1,425,000 was also to be placed in a site-specific Special Account to be used for future response action at or near the site. The CD formalizing this settlement was entered in court on September 25, 2000. The settlement amount received by the State of Connecticut will, along with other funds provided by the State, allow the State to take the lead on implementing clean-up of the nearby solid waste landfill.

5.0 PROGRESS SINCE LAST FIVE-YEAR REVIEW

In the third five-year review, dated September 29, 2008, EPA certified that the remedy selected for this site remains protective of human health and the environment.

The third five-year review noted that since the approval of the ACLs, there have been ACL exceedances at various POC wells, as well as MCL exceedances in groundwater across the river. At that time, the exceedances did not represent a risk to human health since there was no current exposure to contaminated groundwater, and none of the exceedances warranted further action beyond evaluation. The third five-year review stated that EPA would conduct a screening-level human health risk review of the ACL values, as well as recent ACL exceedances, to determine whether the ACL values require updating and/or whether added investigation of surface water and sediment is needed.

Also, in the third five-year review, EPA reviewed levels of PAHs in sediment and concluded that these levels do not pose a significant risk to human health from potential incidental ingestion of and dermal contact with PAHs. EPA had also preliminarily concluded that the source of PAHs in sediment is from an unknown location upstream of the lagoon and the nearby landfill. The third five-year review stated that EPA was to continue evaluating PAH exceedances in sediment.

To follow-up on these findings, in 2009, EPA conducted a screening-level human health risk assessment which assessed a recreational swimmer exposure to surface water and sediment. The assessment used surface water exposure point concentrations equal to the maximum groundwater concentrations detected at the point of compliance/POC wells between April 2000 and October 2008 that exceeded their respective ACLs more than one time. Sediment exposure point concentrations were assumed to be equal to concentrations detected in the most recent sampling round of November 2006. EPA's assessment concluded that risks associated with potential adolescent recreational exposure to contaminants in surface water and sediment do not exceed acceptable levels, and that no further action or review was required for human health risk assessment purposes.

To further evaluate potential ecological risk from PAHs, EPA identified the maximum detected concentrations of contaminants in groundwater samples collected throughout the site between 2002 and 2005 and compared these concentrations to conservative surface water chronic toxicity benchmarks. These concentrations were also divided by 10, 100, and 1000 to obtain "order of magnitude" hypothetical dilution factors in the Quinebaug River. Only a few PAHs, primarily benzo(a)anthracene and benzo(a)pyrene, were present above their benchmarks. However, certain VOCs (e.g., ethylbenzene, toluene, and xylene), metals (e.g., arsenic, chromium, manganese), and organochlorine pesticides (e.g., 4,4'-DDD and 4,4'-DDT) showed much higher benchmark exceedances under undiluted and diluted assumptions.

EPA determined that it was no longer appropriate to use PAHs to identify contaminant releases from the former waste lagoon into the Quinebaug River. Note, however, that

although PAHs are no longer considered to be site-related contaminants, EPA's 2009 screening-level human health risk assessment concluded that potential adolescent recreational exposure to PAHs in sediment does not exceed levels of health concern.

After the third five-year review, EPA re-focused the monitoring program by identifying site-specific analytes of concern based on groundwater data collected between 2004 and 2008 from the three POC wells (wells B, C, and G) located around the former waste lagoon. An approach was developed to identify the analytes of concern based on the following considerations: (a) a compound in the POC well groundwater samples is present at levels above its analytical detection limit, (b) a compound in the POC well groundwater samples is present above its local groundwater background level, (c) a compound in the POC well groundwater samples is present at levels above its surface water chronic toxicity benchmark, (d) the water solubility of a compound, (e) the affinity of a compound for organic carbon in sediment, and (f) the detection of a compound in more than 10% of the POC well groundwater samples collected between 2004 and 2008. Any chemical in POC well groundwater was retained as an analyte of concern if it met all these specific parameters.

This approach produced a list of 26 final analytes of concern including nine VOCs, four semi-VOCs, and 13 metals (see Table 1). EPA developed a sediment sampling program for the Quinebaug River for these compounds, which also included the review of analytical data from sediment pore water samples collected from four well points located in the Quinebaug River across and downstream from the former waste lagoon.

The analytical data obtained from the 2009 sediment sampling program in the Quinebaug River (which included several sampling transects in the immediate vicinity of the well points) were interpreted within the context of a conservative Screening-Level Ecological Risk Assessment (SLERA). The SLERA did not identify any of the analytes of concern as ecological risk drivers to benthic invertebrates in the Quinebaug River. The concentrations of the analytes of concern in the sediment samples were either similar to upstream background levels or fell below conservative toxicity-based sediment screening benchmarks. This conclusion was uncertain for the four phenolic compounds presented in Table 1 because their analytical detection limits exceeded the sediment screening benchmarks.

The 2009 sediment sampling effort resulted in the following conclusions:

- The concentrations of analytes of concern measured in groundwater samples collected from the three POC wells around the former waste lagoon between 2004 and 2008 did not affect the quality of the sediments collected from the Quinebaug River in the fall of 2009.
- The POC wells can be used as "sentinels" to determine if contaminated groundwater originating from the former waste lagoon may impact sediment in the nearby river via groundwater recharge.

- Sediment in the Quinebaug River does not need to be automatically sampled as part of a future monitoring effort unless data show that the levels of one or more analytes of concern in groundwater samples collected from the three POC wells have substantially changed compared to past trends.

The final step in the process consisted of developing groundwater trigger values and decision points for the 26 analytes of concern in the three POC wells to help identify the need for future sediment sampling in the Quinebaug River. The trigger values were derived using a two-step process, as follows:

- Step 1: Calculate the 95th percentiles for each of the 26 analytes of concern using the detected values measured in all the groundwater samples collected from the three POC wells between 2004 and 2008. These 95th percentiles by themselves could not serve as trigger values since they were not associated with impacts to the sediment in the Quinebaug River, as was shown in the fall 2009 sediment sampling effort and in the SLERA.
- Step 2: Adjust the 95th percentiles upwards based on a multiplier factor. A large factor would allow analytes of concern in the POC wells to reach higher concentrations before prompting a sediment sampling event. It is not known how much more the levels of analytes of concern can rise in the POC wells before affecting the sediment in the Quinebaug River via groundwater recharge. To address this uncertainty, EPA selected a very conservative low multiplier factor of 2.0. Table 1 provides the trigger values that were developed for all the analytes of concern derived using this multiplier factor.

Table 1: Trigger values developed for 26 analytes of concern in groundwater samples collected between 2004 and 2008 from the three point of compliance wells around the Former Yaworski Waste Lagoon

Analytes of concern	maximum concentration (ug/L)	95 th percentile (ug/L)	"trigger" values (ug/L) ^a	No. of times above trigger value ^b
Volatile Organic Compounds				
1,1-dichloroethane	210	120	240	0
cis-1,2-dichloroethene	32	27	54	0
4-methyl-2-pentanone	6400	6300	12600	0
benzene	57	51	102	0
chloroethane	8900	3000	6000	1
ethylbenzene	4400	2900	5800	0
isopropylbenzene	190	170	340	0
toluene	2300	980	1960	1
xylene (total)	17000	15000	30000	0
Semi-Volatile Organic Compounds				
2-methylphenol	30	28	56	0
2,4-dimethylphenol	65	56	112	0
4-methylphenol	140	140	280	0
phenol	190	150	300	0
Inorganics				
aluminum	110	55	110	1
arsenic	190	160	320	0
barium	630	575	1150	0
cadmium	1.4	0.67	1.34	1
cobalt	140	88	176	0
copper	24	11.4	22.8	1
iron	110000	84600	169200	0
lead	10.5	0.81	1.62	2
manganese	7700	6000	12000	0
nickel	65	36	72	0
selenium	5.3	2.5	5.0	1
thallium	2.4	1.5	3.0	0
vanadium	21	14	28	0

^a the trigger values were obtained by multiplying the 95th percentiles by a factor of 2

^b these values show the number of times that an analyte of concern exceeded its trigger value in any of the three point of compliance wells between April 2004 and October 2008

The analysis of the groundwater data obtained from the POC wells between 2004 and 2008 showed that: (a) the trigger values typically, but not always, exceeded the maximum detected concentrations measured in the three POC wells between 2004 and 2008, and (b) two VOCs (i.e., toluene and chloroethane) and four metals (i.e., cadmium, selenium, copper, and aluminum) exceeded their trigger values once during the 2004 to 2008 POC well sampling effort, whereas lead exceeded its trigger value twice during the same period.

After deriving the trigger values, EPA developed decision points to determine how many times an analyte of concern in the POC wells could exceed its trigger value before it would become necessary to evaluate the need for sediment sampling in the Quinebaug River. The 2009 sediment sampling results showed that exceeding a trigger value should not be a concern by itself since the observed historical exceedances in the POC wells have not created sediment issues in the nearby river over the extensive monitoring program. The analytical data from the three POC wells sampled between 2004 and 2008 also showed that relatively large variations in the concentrations of analytes of concern can occur across sampling depths and wells during one sampling event or in the same wells and sampling depths over time.

Therefore, EPA decided that further evaluations might be needed only if the trigger value for one or more of the analytes of concern are exceeded (a) at least three times during one sampling event across different sampling depths and/or POC wells, or (b) in the same POC well and sampling depth over three consecutive sampling events. A review of the POC well groundwater data showed that this condition did not occur in any POC well or at any time between 2004 and 2008.

More recently, EPA reviewed data from 14 POC well sampling rounds between April 2008 and September 2012 for the 26 analytes of concern. During this time period, 20 of the 26 analytes of concern did not exceed their respective trigger values, but chloroethane, cadmium, lead, manganese, nickel and selenium exceeded their respective trigger values one or more times.

- Chloroethane reached or exceeded its trigger value of 6,000 µg/l on two unrelated occasions.
- Cadmium exceeded its trigger value of 1.34 µg/l four times in the shallow, intermediate and deep flow zones during April 2012 (ranging from 3 µg/l to 5 µg/l) and three times in the shallow, intermediate and deep flow zones during September 2012 (ranging from 5 µg/l to 7 µg/l).
- Lead exceeded its trigger value of 1.62 µg/l once in April 2008 (10.5 µg/l), four times in the shallow and intermediate flow zones of the three POC wells in April 2012 (all four exceedances at 2 µg/l), and three times in the shallow and intermediate flow zones of the three POC wells in September 2012 (2 µg/l, 5 µg/l, and 51 µg/l).
- Manganese exceeded its trigger value of 12,000 µg/l once in September 2012.
- Nickel exceeded its trigger value of 72 µg/l once in April 2010.
- Selenium exceeded its trigger value of 5.0 µg/l four times in the shallow, intermediate, and deep flow zones of POC wells B and C (11 µg/l, 35 µg/l, 39 µg/l and 51 µg/l) in January/February 2012 and six times in the shallow,

intermediate, and deep flow zones of the three POC wells (8 µg/l, 9 µg/l, 15 µg/l, 21 µg/l, 33 µg/l, and 62 µg/l) in April 2012.

The above exceedances were measured against the two conditions that prompt the need for further evaluation as outlined above.

The exceedances for chloroethane, manganese and nickel did not require further evaluation because they failed to meet the minimum requirements outlined above. Chloroethane exceeded its trigger value on two occasions during two non-consecutive sampling events, whereas manganese and nickel exceeded their respective trigger value only once.

The cadmium, lead, and selenium exceedances required further evaluation because they met the requirement of three or more exceedances of the trigger value during one sampling event across different sampling depths and/or POC wells.

Twenty-four of the 25 exceedances for these three metals occurred during 2012, and particularly during the April 2012 (14 exceedances) and September 2012 (9 exceedances) sampling events. This apparent clustering could represent a sudden increase in cadmium, lead and selenium levels in the groundwater around the former waste lagoon in 2012, but could also point to an unknown bias during the 2012 sampling or analysis efforts. The State used a different analytical laboratory for all of the 2012 data than the one previously used by EPA, which may also account for some of the newer detections.

Selenium was either consistently not detected or present at low estimated concentrations until January/February 2012, when it was suddenly detected in four of the eight available POC well samples and again in April 2012, when it was detected in six of the eight available POC well samples. The analytical laboratory subsequently reported to CT DEEP's contractor that the selenium exceedances resulted from spectral interferences with the Inductively Coupled Plasma-Atomic Emission Spectrometry ICP-AES (6010) method. Starting in September of 2012, selenium was analyzed by the ICP-Mass Spectroscopy MS (6020) method, which does not experience the same interference. Selenium was not detected above its detection limit in any of the POC well samples in September 2012, and EPA determined that the earlier 2012 selenium exceedances represented a false positive result from the analysis as verified by the subsequent testing using another analytical methodology. The earlier 2012 selenium exceedances did not represent a sudden surge of selenium from the lagoon.

Monitoring has not yet occurred in 2013, so is not yet known if the April and September 2012 exceedances of cadmium and lead will subside or reoccur. EPA concluded that cadmium and lead needed to be closely monitored to see if the 2012 exceedances continue in the future. The pattern observed in 2012 warrants attention but does not yet require a direct evaluation of sediment quality in the Quinebaug River.

In the third five-year review, EPA noted that institutional controls had not yet been implemented at three off-site properties that are not PRP-owned, but that the agencies had

initiated surveys and other work required to finalize easements to implement restrictions on all three properties. These restrictions are required to prevent groundwater pumping from drawing contamination into uncontaminated areas, and to also prevent exposure to contaminants in groundwater. Access is also required to a fourth adjacent off-site property.

Between August 2010 and January 2011, Environmental Land Use Restrictions (ELURs) were recorded on the three properties requiring groundwater use restrictions, and an easement was recorded on the fourth property requiring access. The process of obtaining these ELURs was protracted due to the switch from PRP-lead to Fund-lead activity as the original CD intended for the PRPs to make arrangements for access and use restrictions. Fund-lead implementation of this portion of the remedy by EPA and the State of Connecticut required compliance with Connecticut's newer Environmental Land Use Restrictions regulations, involving steps that were not foreseen in the original ROD and CD. EPA and the State of Connecticut had to obtain subordination agreements from banks holding mortgages on the properties in question. EPA and the State of Connecticut subsequently drafted formal easements for the properties pursuant to Connecticut's Environmental Land Use Restrictions regulations, which also required survey maps of the properties. EPA received approval from Headquarters to directly pay the landowners for access and groundwater use restrictions, and ultimately arranged for the U.S. Army Corps of Engineers to perform appraisals and conduct the appropriate surveys on the properties.

Last, the third five-year review also noted that land and groundwater use restrictions were required within the meander bend of the river on Yaworski-owned properties. The Yaworskis had previously agreed to these restrictions pursuant to a 1990 CD. As part of a September 25, 2000 settlement with the Yaworskis, the CD requires the Yaworskis to additionally execute and record in the deed an easement granting the right to enforce the land and water use restrictions. In 2008, the agencies determined that easements, rather than ELURs, were appropriate for the Yaworski-owned properties. EPA is working with the State of Connecticut, including CT DEEP and the Connecticut Office of the Attorney General (CT AG), to implement easements on these properties. Title searches of the properties have been performed and have identified a number of liens that may also require subordination before the easements can be recorded.

The Yaworskis continue to cooperate with the agencies to restrict all use of groundwater and to restrict certain land uses. Because there are no structures or drinking water wells located within or immediately downgradient of contaminated groundwater from the site or the groundwater use restriction zones, there is no risk to human health via ingestion of groundwater or potential vapor intrusion.

6.0 FIVE-YEAR REVIEW PROCESS

This five-year review was conducted in accordance with EPA's guidance document, *Comprehensive Five-Year Review Guidance*, EPA 540-R-01-007, dated June 2001. Tasks completed as part of this five-year review include review of pertinent site-related

documents, an inspection of the site, discussions with CT DEEP, and a review of the current status of regulatory or other relevant standards.

Document Review.

Site-related documents reviewed as part of this effort are listed in Attachment 6. Additionally, this review included review of all recent post-closure monitoring reports and data.

Community Involvement/Interviews.

This is the site's fourth five-year review. A public notice announcing the start of the third five-year review was published in the *Norwich Bulletin* on January 4, 2013. EPA received no calls as a result of the public notice. EPA did not conduct individual citizen interviews.

Community interest in the past was mainly limited to citizens that lived in the immediate area, most along Packer Road, and many of these citizens formed a group, Peoples Rights in a Clean Environment ("PRICE"). PRICE was active at the site throughout the 1990's, although the bulk of their complaints were related to impacts on local residents from the nearby municipal solid waste landfill.

In October 1999, the United States entered into mediation with a judge of the Connecticut Superior Court and various parties regarding (a) the U.S. lawsuit regarding the Superfund site, (b) litigation brought by the State of Connecticut relating to the Yaworski Lagoon Superfund site and the adjacent Yaworski-owned and Connecticut-regulated Packer Road Landfill, (c) a suit brought by the citizen's group PRICE relating to the State-regulated landfill, and (d) back taxes owed to Connecticut, and other remaining obligations of the Yaworskis. The U.S., Connecticut, PRICE, the Yaworskis, and various Yaworski-related entities achieved global settlement of all suits through mediation. As part of the landfill-related settlement, property belonging to many of the members of PRICE was bought by the Yaworskis and those people moved away from the area.

Since the settlements took place, and because the area around the site is largely rural, there has been virtually no interest in the Superfund site by local residents. The Yaworskis have resold many of the houses along Packer Road. EPA and CT DEEP have received an extremely limited number of calls in recent years, most of which are from citizens interested in buying houses in the area or inquiries regarding a nearby biomass plant that is unrelated to the site.

The public information repository is located at the Canterbury Public Library and continues to be supplemented with key documents. EPA will issue a press release to local papers regarding the availability of the fourth five-year review, the completed report for this site will be sent to the information repository, and EPA will post the report on the regional website.

Data Reviewed.

The PRPs monitored groundwater, surface water, and sediment on a regular basis since 1993 as part of the long-term compliance monitoring plan. With the default of all PRPs in 1996, EPA took over the compliance monitoring and its contractor continued to perform monitoring three times a year through September 2011.

In September 2011, EPA and the State entered into a memorandum of agreement in which CT DEEP assumed all operation & maintenance activities for the site, including compliance monitoring. Prior to the site transfer from EPA to the State, EPA arranged for its contractor to inspect all wells and perform repairs where necessary.

All activities undertaken by EPA's contractor were reviewed and approved by EPA staff and found to comply with all EPA and State requirements. All Quality Assurance Project Plans utilized at the site by PRP contractors incorporate QA/QC procedures and protocol. All Quality Assurance Project Plans utilized at the site by EPA contractors were reviewed and approved by the project manager and EPA QA staff. CT DEEP has an approved Quality Assurance Project Plan, and was also provided with approved plans used by EPA's contractor.

To date, CT DEEP has been using the same contractor (AECOM, previously known as Metcalf & Eddy) to perform compliance monitoring that EPA used from 1996-2011. CT DEEP, however, does use a different analytical laboratory than the one previously used by EPA.

During Fund-lead monitoring at the site, EPA's contractor performed monitoring three times a year, generally in April, July, and October. The July/summer round includes analysis for a larger list of analytes to ensure there are no new emerging contaminants. The last Fund-lead monitoring round conducted by EPA was in July 2011:

After CT DEEP assumed all O&M activities in September 2011, it was not able to make contractual arrangements for monitoring until February of 2012. In 2012, CT's contractor performed monitoring in February, April and September, with the September round serving as the "summer round" that includes the larger suite of analytes. In late 2012, CT DEEP issued a new remediation contract, which required CT DEEP to re-issue a purchase order to continue the monitoring work. To date, CT DEEP still does not have funding in place to issue the purchase order. CT DEEP expects to have funding in place shortly, which may allow for the next monitoring round to be conducted in August 2013.

EPA, in conjunction with CT DEEP, has evaluated all site-wide exceedances. A summary of exceedances since the last five-year review is provided in Attachment 4. EPA and CT DEEP continue to evaluate ongoing ACL exceedances at point of compliance/POC wells. These exceedances are somewhat sporadic in nature. Chloroethane seems to exceed its ACL most frequently, but the exceedances do not repeat consistently in the same wells from round to round, and the exceedances to date do not pose a significant risk to human health or the environment.

No site-related compounds exceeded MCLs in wells across the river from the site between 2008-2012. Across the river, manganese, iron and aluminum exceeded Secondary MCLs, which are non-enforceable guidelines for aesthetic considerations. None of these compounds are site contaminants.

EPA has a new cleanup goal for manganese in drinking water, however, there are no known drinking water wells within or near the known boundaries of the groundwater plume. Further, manganese has been detected above Secondary MCLs in upgradient well cluster H (see Attachment 4).

There are ongoing non-site related MCL exceedances at well cluster K (and well cluster L). EPA believes these exceedances are not related to the Yaworski Lagoon site. EPA added well cluster K to its compliance monitoring program in 1998 to supplement investigations for the benzene exceedance at well Ni. Since June/July 1998, EPA has detected trichloroethene (TCE) at well Ki in every sampling round in generally increasing concentrations, well over the MCL of 5 ppb. Well cluster K was not sampled between April 2008 and July 2010 due to access issues, but since sampling resumed in October 2010, TCE has been detected in well Ki at levels ranging up to 313 ppb, and in well Kd at levels ranging up to 69 ppb. TCE levels were also detected in well Ld (located on the landfill side of the river) during every sampling round in the last five years at levels ranging up to 610 ppb. In the last five years, there have also been some TCE detections (ranging from non-detect to 6.15 ppb) in the deep wells in clusters P and M; both of these well clusters are located between the lagoon and landfill plumes.

Beginning in 2003, cis-1,2-dichloroethene was also detected over the MCL of 70 ppb at wells Ki and Ld at generally increasing levels. Cis-1,2-dichloroethene was detected at well Ki at levels ranging up to 120 ppb, and at well Ld at levels ranging up to 270 ppb.

Beginning in 2010, EPA also notes that vinyl chloride has been detected somewhat regularly over the MCL of 2 ppb in wells Ld and Li, with levels ranging up to 2.8 ppb and 2.9 ppb respectively.

The exceedances indicate that the river is not acting as a hydraulic barrier at the K well cluster, however, the data strongly suggests that there are two volatile organic compound plumes, one from the lagoon and the other from the Packer Road Landfill which is not part of the Superfund site. The relative proportions of various compounds differ between the two plumes, and data also indicate that the plumes are separate and distinct in the area investigated. Both plumes appear to have migrated beneath the river. In 1998, EPA collected groundwater samples from a number of temporary small-diameter wells, and the data at that time suggested that both plumes extended only a short distance beyond the river. Since 1998, however, the level of chlorinated compounds has increased at wells Ki and Kd. EPA has no wells downgradient of the K well cluster. CT DEEP continues to be alerted of the presence of the plume that appears to be emanating from the State-regulated Landfill.

Monitored natural attenuation was selected as the corrective action measure for the ongoing benzene exceedance across the river, and this remedy appears to be working as predicted based on lack of any recent detections of benzene at well Ni. The last detection of a benzene MCL exceedance occurred in April 2006 with a detection of 5.6 ppb. Since then, benzene at well Ni has been detected below the MCL of 5 ppb or not detected. (Note that the N well cluster was not sampled between April 2008 and July 2010 due to access issues, but benzene has not been detected at well Ni since sampling resumed in October 2010.)

Discussion regarding EPA review of sediment data and groundwater trigger values for sediment evaluation is provided in Section 5.0.

Site Inspection.

EPA and CT DEEP conducted a site inspection on April 3, 2013 and found the lagoon cap, vegetative cover, gabion wall, and the fence gates and locks to all be in good condition. Only minor deficiencies were observed. The fence was slightly damaged from trees, however, the damage does not appear to warrant immediate repair. Signs posted along the fence are weathered, but all are still legible and do not yet require replacement. There is a continuing problem with deep ruts near the southern edge of the lagoon cap within the fence line, but these ruts are located off the cap and do not appear to have any impact on the integrity of the remedy. Well Fd was unlocked and requires a replacement lock; CT DEEP has notified its contractor, AECOM, to replace the lock during the next sampling round. Moderate vegetation was growing up through the riprap along the southern side of the lagoon cap. While this does not appear to be impacting the cap or riprap, CT DEEP will request that the Connecticut Parks Department address the overgrowth. Four drums of purge water are located within the fence line; the agencies will make arrangements for off-site disposal later this year. The agencies did not observe anyone in the lagoon area during the visit. The former transfer station area near the entrance to the overall landfill area is being used as a lay down area for construction of a nearby biomass plant in Plainfield, CT. The site inspection checklist is provided as Attachment 5.

CT DEEP will continue to perform O&M activities for the lagoon cap, including inspections, mowing the vegetative cover, and conducting repairs as necessary to ensure ongoing integrity of the lagoon cap. CT DEEP will also continue to arrange for all site-wide compliance monitoring activities. EPA and CT DEEP will evaluate all monitoring results, and make ongoing determinations of the need for remedial action for future exceedances, if any.

7.0 TECHNICAL ASSESSMENT

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

No, the remedy as outlined in the ROD is currently not operating as designed, due to the lack of implemented institutional controls at Yaworski-owned properties. In addition,

monitoring has been delayed in 2013. In all other aspects the remedy is functioning as intended in the ROD.

The 1988 ROD outlined the following specific objectives for the remedial response:

- minimize exposure to contaminated groundwater;
- ensure that contamination from the lagoon does not adversely impact the Quinebaug River;
- protect environmental receptors in the wetlands;
- minimize exposure to contaminated leachate seeps; and
- attain ARARs.

As required by the 1988 ROD, a permanent, multi-layer cap was constructed over the lagoon, in conjunction with reinforcement of the surrounding dike and installation of a fence around the lagoon. The lagoon cap and fencing are performing as intended and continue to be maintained and repaired as necessary. A settlement monitoring program did not identify any problems caused by settlement or lateral movement. No problems with the cap have been identified that fall outside of the range of normal maintenance. The lagoon cap has minimized the ongoing discharge of contaminated groundwater to surface water and sediment, and has eliminated runoff to the wetland area and potential direct exposure to contaminated debris and groundwater.

ACLs were established as the groundwater protection standard for the site, in conjunction with a compliance monitoring program to sample groundwater, surface water and sediment. PCLs were set in the river where receptors could be potentially exposed. Monitoring for MCLs continues across the river from the site as a measurement to ensure that the river is maintained as a hydraulic barrier.

Data from 2008-2012 indicates ACL exceedances at various POC wells, although these exceedances are somewhat sporadic. EPA has determined that the ACL exceedances do not represent a risk to human health since there is no current exposure to contaminated groundwater, and exposure to potential contaminants in surface water and sediment do not exceed levels of health concern.

MCL exceedances for benzene at well Ni across the river triggered the Corrective Action Program contingency in the ROD. After Pre-Design investigations, monitored natural attenuation was selected as the most appropriate remedy. Levels of benzene at well Ni decreased as anticipated, and the last detection of a benzene MCL exceedance occurred in April 2006. Since then, benzene at well Ni has been detected below the MCL of 5 ppb or not detected. Additionally, there is no current exposure to groundwater in the vicinity of well cluster N.

Although there are MCL exceedances at well cluster K, EPA believes these exceedances are not site-related, originating instead from the State-regulated Packer Road Landfill.

For sediment, EPA concluded that cadmium and lead need to be closely monitored to see if exceedances of groundwater trigger levels for these compounds continue in the future. While the pattern of exceedances in 2012 warrants attention, a direct evaluation of sediment quality is not yet required. EPA also concluded that the Yaworski Lagoon site is not the source of PAHs in river sediment, and no further evaluation of PAHs in sediment is required.

No other exceedances have warranted further evaluation. EPA continues to evaluate sampling results and overall site conditions, and discusses exceedances and evaluation of these exceedances with CT DEEP.

As previously outlined, CT DEEP has not yet been able to arrange for monitoring in 2013. While this currently represents a data gap, the delay in monitoring has not had an impact on the protectiveness of the remedy.

The last component of the remedy is institutional controls, some of which have not yet been implemented as required. ELURs have been recorded at three off-site properties to the north, west, and south of the site, and an access easement has been recorded at a fourth property.

With respect to land use and groundwater use restrictions within the meander bend of the river, the Yaworskis agreed to these restrictions pursuant to the February 26, 1990 CD. As part of the September 25, 2000 settlement with the Yaworskis, the CD requires the Yaworskis to additionally execute and record in the deed an easement granting the right to enforce the land and water use restrictions. In 2008, the agencies determined that easements, rather than ELURs, were appropriate for the Yaworski-owned properties. EPA is working with the State of Connecticut, including CT DEEP and the Connecticut Office of the Attorney General (CT AG), to implement easements on these properties. Title searches of the properties have been performed and have identified a number of liens that may also require subordination before the easements can be recorded.

The Yaworskis continue to cooperate with the agencies to restrict all use of groundwater and to restrict certain land uses. Because there are no structures or drinking water wells located within or immediately downgradient of contaminated groundwater from the site or the groundwater use restriction zones, there is no risk to human health via ingestion of groundwater or potential vapor intrusion.

Cost of System Operation/O&M.

The 1988 ROD estimated the total cost of the remedy at \$2,976,000, including total capital costs of \$2,259,300 and a total O&M present worth of \$716,600. The PRPs were not initially required to report on their expenditures pursuant to the 1990 CD.

During the period from February 1990 to October 1993, Pervel Industries, Inc. was the lead PRP performing the work. The CD capped oversight at \$225,000 until Remedial Design/Remedial Action construction was completed, and the PRPs reached that cap with

payments made in August 1992. When Pervel notified EPA in October 1993 that it was unable to continue performing work, their parent company, the Bemis Company, provided EPA with copies of invoices and checks proving that they had expended the full amount of a \$4,000,000 financial guarantee. This amount included lagoon cap construction costs, and costs to develop all required work plans, including the ACL Demonstration Plan. This amount did not include the costs of quarterly monitoring and lagoon cap O&M since March 1993, which was paid for by the Yaworskis.

The Yaworskis continued to pay for quarterly monitoring and lagoon cap O&M after October 1993, until they also ceased performing/financing work in October of 1996. While the Yaworskis' exact costs during this period are unknown, their contractor had previously provided certain 1994 invoices to EPA which indicate that the lagoon cap O&M cost between \$3000 - \$4000 per year, and the cost of monitoring and all associated laboratory work, data validation, and reporting, totaled almost \$400,000 per year.

The site has been Fund-lead since December 1996. The total cost for the EPA contractor's performance of the Pre-Design Investigation related to the benzene exceedance is approximately \$631,000. The total budget for the EPA contractor's performance of compliance monitoring from March 1997 through the July 2001 monitoring event, as well as development of ACLs, is \$2.65 million. Since October 2001, the total cost for the EPA contractor's performance consistently totaled, on average, approximately \$600,000 per year. These costs include the costs to perform compliance monitoring, including all associated laboratory work, data validation, and reporting, as well as all administrative costs required to open, manage, and close new work assignments/task orders under changing contract mechanisms.

EPA's contractor continued performing the compliance monitoring through June 2011, and continued follow-up activities for several months thereafter. In the last year of Fund-lead compliance monitoring, costs had dropped to less than \$300,000 per year due to several modifications to the monitoring program.

CT DEEP currently estimates that monitoring costs total approximately \$240,000 per year.

EPA's and CT DEEP's direct and indirect costs are not included in these estimates. These costs also do not include O&M of the lagoon cap, for which the State took over all responsibilities at the time the site went Fund-lead.

While it is not possible to calculate the exact difference between actual project cost and the ROD estimate, actual costs are significantly higher. This is largely attributable to the eventual default of all PRPs, requiring a highly unusual and unplanned switch from PRP-lead to Fund-lead during Remedial Design/Remedial Action. Prior to the Fund takeover, project costs had already exceeded ROD estimates mainly due to the contentious disagreements between the agencies and the PRPs regarding the methodology by which to set ACLs, followed by the unexpected exceedance of benzene across the river and the subsequent need to implement the Corrective Action program.

EPA received three separate settlement payments (as outlined in “Enforcement History”) to resolve all outstanding liabilities for all remaining PRPs. Payments of \$310,903 from five low-volume generators, \$3,000,000 to settle U.S. v. Bemis/Pervel, and \$1,425,000 to settle U.S. v. Yaworski, Inc., et. al., and interest for all three payments were placed in a Site-Specific Special Account. EPA drew off of these funds to pay for ongoing compliance monitoring through 2011, and very little money remained upon completion of all Fund-lead activities.

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

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of remedy selection are still valid. Detail on the effect of significant changes in standards and assumptions used at the time of the remedy selection is presented below.

Changes in Standards. The 1988 ROD, page 41, identifies laws, regulations and guidance as applicable to the proposed remedial alternative. Changes in standards since the 1988 ROD do not appear to affect the protectiveness of the remedy.

- EPA Risk Reference Doses; Carcinogen Group Potency Factors; and Federal Interim Sediment Criteria Values. These ARARs were all considered during development of ACLs, and any updated values were incorporated in risk screenings performed as part of this five-year review. (See section below, “Changes in Toxicity and Other Contaminant Characteristics; Changes in Risk Assessment Methods.”)
- Connecticut Remediation Standard Regulations (RSRs), Regulations of Connecticut State Agencies (R.C.S.A.) Sections 22a-133k1 to 3, and Connecticut Environmental Land Use Restriction (ELUR) Regulations, R.C.S.A. Section 22a-133-q-1 adopted pursuant to Sections 22a-133k, and 22a-133q of the Connecticut General Statutes. These regulations were adopted on January 30, 1996, thus they were not ARARs at the time of the 1988 ROD, and were not considered during remedy development. Revised RSRs were adopted June 27, 2013, which included a direct exposure criterion change for lead that is not relevant to this site.

Changes in Exposure Pathways. No new human health or ecological exposure pathways or receptors have been identified. There are no changes in land use or the anticipated land use on or immediately near the site. A discharge pipe related to a new biomass plant being constructed in the area is located downstream of the lagoon along the Quinebaug River. No new contaminants or contaminant sources have been identified since the completion of the Pre-Design investigations for the benzene exceedance in 1998, with the exception of a contaminant plume that appears to be emanating from the adjacent State-regulated Packer Road Landfill. EPA determined that PAH exceedances in sediment most likely reflected regional background concentrations.

Changes in Toxicity and Other Contaminant Characteristics; Changes in Risk Assessment Methods. The 1988 ROD stated that dermal contact with contaminated leachate and sediments would pose an incremental lifetime cancer risk, and although contaminated groundwater was not being consumed at the time, ingestion of groundwater would result in risks that exceed EPA's cancer risks target and exceed acceptable reference doses for exposure to non-carcinogens. Concentrations of heavy metals in the wetland due to leachate flow from the lagoon and erosion of contaminated sediments also exceeded chronic and acute Ambient Water Quality Criteria and ecotoxicity criteria.

The document review did not provide information regarding the previous cancer slope factors (CSFs) used in the Remedial Investigation/Feasibility Study and the ROD to calculate risk, however, CSFs have generally decreased. Development of PCLs included human health and ecological risk assessments to address risks to site-specific receptors, and subsequent human health and ecological risk screenings and reviews were performed on more recent monitoring data. Further, all of the risks identified in the ROD as outlined above have been addressed at this time, and most of the exposure scenarios associated with site contaminants and remedial action objectives remain the same as those identified at the time of the ROD. While ACL exceedances and the benzene exceedance in groundwater across the river were not anticipated at the time of the ROD, there is no current route of exposure to contaminated groundwater. Human health risk reviews concluded that levels of contaminants at points of exposure (surface water and sediment) are unlikely to pose a significant risk to human health. Ecological risk reviews concluded that levels of contaminants in surface water do not pose a significant risk, and that levels of contaminants in sediment do not currently warrant further evaluation. Note, however, that EPA recommends continued monitoring to ensure 2012 exceedances of cadmium and lead trigger values do not continue.

EPA has new human health screening data for potential vapor intrusion of TCE. At Yaworski Lagoon, however, TCE and other chlorinated compounds are not contaminants of concern. Although TCE and other chlorinated compounds continue to be detected in well clusters K and L, as well as nearby well clusters P and M, EPA believes these wells are impacted by a plume emanating from the Yaworski (Packer Road) Landfill and not the Superfund Site. Further, there are no structures above or immediately downgradient from the groundwater plume at the Yaworski Lagoon Site. Based on this information, EPA concluded that vapor intrusion of TCE is not a concern for this Site.

EPA also has a new cleanup goal for manganese in drinking water. Manganese, however, is not a Site contaminant. While manganese levels are elevated in wells throughout the Site, groundwater in the area is not used for drinking water purposes. Manganese, as well as arsenic, are present in sediment, however, based on human health and ecological risk screenings, the concentrations do not warrant further evaluation.

Expected Progress Towards Meeting RAOs. The remedy is progressing as expected, with the exception of the need to implement monitored natural attenuation for the benzene exceedance across the river. The remedy implemented for this specific exceedance progressed as expected, and it appears that the benzene exceedances have

ceased. EPA determined that PAH exceedances in sediment are not related to the site. EPA conducted human health and ecological risk reviews of ACL values and ACL exceedances, and determined there is no current risk to human health or the environment.

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

No, no new information has come to light that could call into question the protectiveness of the remedy.

As previously outlined, ELURs were successfully recorded on three off-site properties, and an access easement recorded on a fourth off-site property. Additional land and groundwater use restrictions are required on the Yaworski-owned properties within the meander bend of the Quinebaug River pursuant to the 1988 ROD, the 1990 CD, and the 2000 CD.

In 2008, the agencies determined that easements, rather than ELURs, were appropriate for the Yaworski-owned properties. An easement on these properties will also serve to notify potential future buyers that hazardous wastes are landfilled on site, and that post-closure use must never be allowed to disturb the lagoon cap or interfere with the remedy in any way. EPA currently continues to work with the State of Connecticut on draft easements. Recent title searches of the properties identified a number of liens that may also require subordination prior to recording the easements.

The Yaworskis continue to cooperate with the agencies to restrict all use of groundwater and to restrict certain land uses. Because there are no structures or drinking water wells located within or immediately downgradient of contaminated groundwater from the site or the groundwater use restriction zones, there is no risk to human health via ingestion of groundwater or potential vapor intrusion. The area around the site is generally restricted by locked gates, and the entrances are posted with no trespassing signs. The lagoon itself is surrounded by a fence with a locked gate. There is no longer any public access to the nearby landfill.

While the public is currently protected, formal groundwater use restrictions must be implemented in order to provide long term protection.

No other new information has come to light which would call into questions the effectiveness of the remedy. No new human or ecological receptors have been identified at this time. No evidence of damage due to natural disasters was noted during the site inspection.

As previously noted, CT DEEP has not yet been able to arrange for monitoring in 2013. While this currently represents a data gap, the delay in monitoring has not had an impact on the protectiveness of the remedy.

Technical Assessment Summary.

The remedy, as outlined in the ROD, is not currently operating as designed, but is meeting all remedial action objectives in the short term. Institutional controls to prevent groundwater migration and exposure to contaminants in groundwater must be implemented in order to provide for long term protection.

The lagoon cap is being maintained and has minimized the ongoing discharge of contaminated groundwater to surface water. CT DEEP continues to conduct ongoing monitoring of groundwater, including monitoring ACLs at the point of compliance, PCLs at the point of exposure, and monitoring of groundwater at point of compliance wells to assess potential impact to sediment. The agencies evaluate all exceedances.

While there has been a delay in monitoring in 2013, CT DEEP is making arrangements now to perform the next monitoring round in August 2013. There is currently no impact to the protectiveness of the remedy due to the delay.

8.0 ISSUES

Based on the activities conducted during this Five-Year Review, the issues identified in Table 2 have been noted.

Issues	Affects Current Protectiveness	Affects Future Protectiveness
Institutional controls not implemented on PRP property.	N	Y
Continued evaluation required for cadmium and lead exceedances of sediment trigger values.	N	Y
O&M monitoring schedule requires improvement.	N	Y

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

In response to the issues noted above, it is recommended that the actions listed in Table 3 be taken:

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Institutional controls not implemented on PRP properties.	Finalize easements for three properties, secure required subordination agreements, and record easement.	Yaworskis, EPA, CT DEEP, CT AG	EPA, CT DEEP, CT AG	09/30/2016	N	Y
Continued evaluation required for cadmium and lead exceedances of groundwater trigger values for sediment.	Continue monitoring of groundwater at point of compliance wells to determine if cadmium and lead exceedances continue. If exceedances continue, perform sediment sampling.	CT DEEP & EPA	NA	09/30/2018	N	Y
O&M monitoring schedule requires improvement.	Finalize administrative requirements needed to continue monitoring.	CT DEEP	EPA	09/30/2013	N	Y

10.0 PROTECTIVENESS STATEMENTS

The remedy at the Yaworski Lagoon Superfund Site currently protects human health and the environment in the short-term because: 1) there is no current exposure to contaminated groundwater originating from the site, 2) threats to human health and ecological receptors from site-related contamination are not significant, based on evaluation surface water and sediment data, as well as evaluation of groundwater trigger levels for sediment and 3) the lagoon cap continues to be an effective barrier to exposure to contaminated waste by human and ecological receptors, and CT DEEP continues to perform O&M on the lagoon cap. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: finalize implementation of institutional controls on PRP-owned properties, continued evaluation of cadmium and lead exceedances of groundwater trigger values for sediment, and finalize administrative requirements needed to continue monitoring.

The public is protected from on-site contaminants because a fence and the lagoon cap impede direct access to the lagoon and the wastes contained within the lagoon. The area around the site is generally restricted by locked gates, and the entrances are posted with no trespassing signs. There is no longer any public access to the nearby landfill. Access

to the lagoon itself is restricted by a fence and a locked gate, and warning signs are posted on the fence.

EPA and CT DEEP perform ongoing evaluation of all results from compliance monitoring of groundwater, including groundwater trigger levels for sediment. None of the groundwater ACL exceedances over the last five years have warranted further action beyond continued evaluation. ACL exceedances do not represent a risk to human health or the environment since there is no current exposure to contaminated groundwater. EPA and CT DEEP continue to evaluate exceedances of groundwater trigger levels in point of compliance wells for sediment. Human health and ecological review indicate there is no significant risk posed by contamination in surface water and sediment. In addition, EPA determined that PAH levels measured in sediment are not site-related. Monitoring must continue in order for this evaluation to occur, and to ensure that the overall remedy continues to be protective.

Institutional controls are required to prevent groundwater pumping from drawing contamination into uncontaminated areas, and to prevent exposure to contaminants in groundwater. Institutional controls have been implemented on three off-site properties. EPA is working with the State of Connecticut to implement institutional controls required on the Yaworski-owned properties within the meander bend of the river.

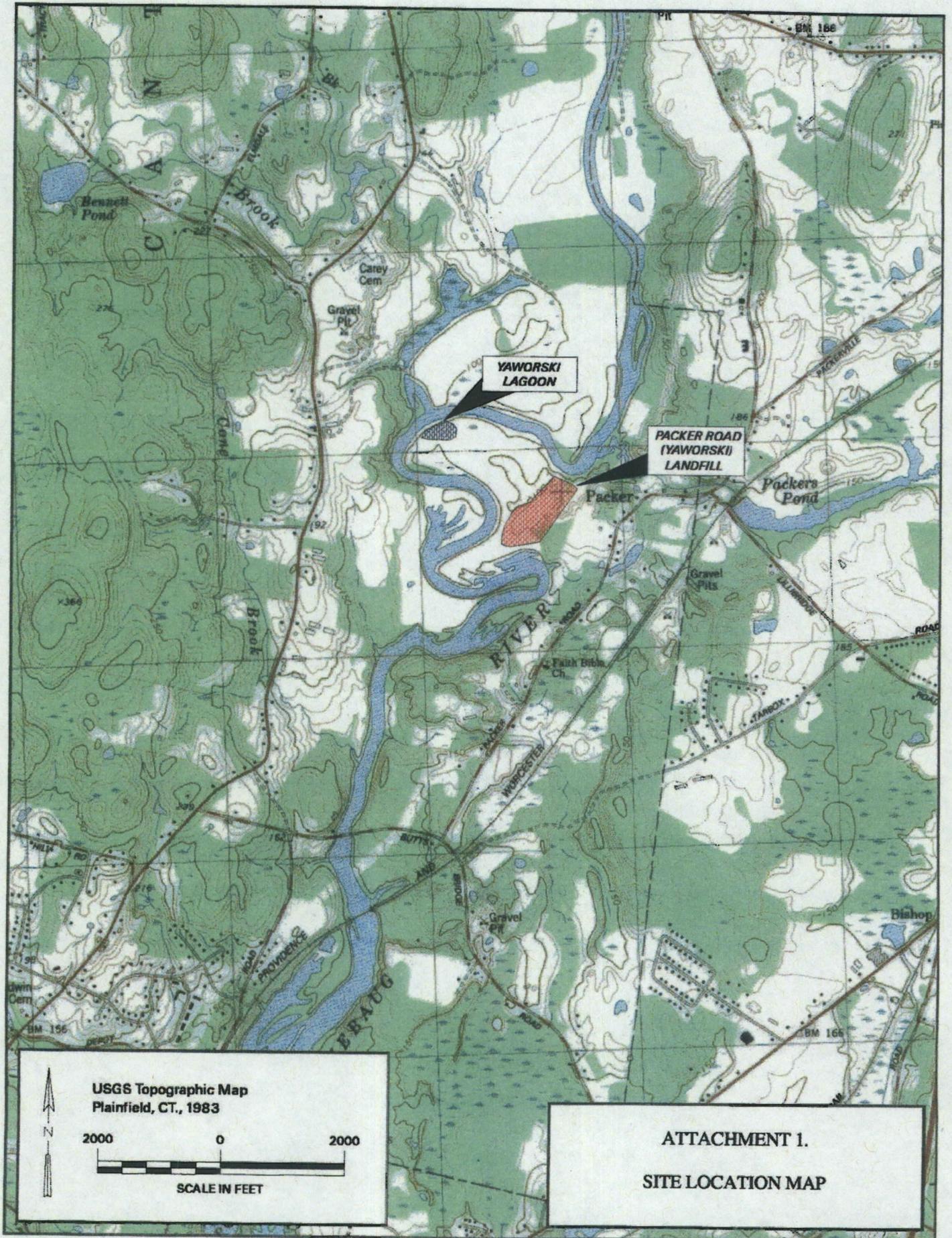
The Yaworskis continue to cooperate with the agencies to restrict all use of groundwater and to restrict certain land uses. Because there are no structures or drinking water wells located within or immediately downgradient of contaminated groundwater from the site or the groundwater use restriction zones, there is no risk to human health via ingestion of groundwater or potential vapor intrusion.

While the public is currently protected, formal groundwater use restrictions must be implemented in order to provide long term protection.

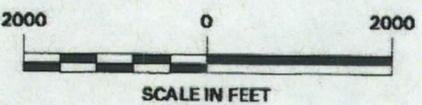
11.0 NEXT REVIEW

The due date for this third five-year review of the Yaworski Lagoon Superfund Site is September 29, 2013, however EPA conducted this five-year review on an accelerated schedule to finalize the report earlier in September 2013. The next five-year review should be completed within five years of the date of this document.

ATTACHMENT 1
SITE LOCATION MAP



USGS Topographic Map
Plainfield, CT., 1983



ATTACHMENT 1.
SITE LOCATION MAP

ATTACHMENT 2
SAMPLING LOCATIONS

ATTACHMENT 3
ALTERNATE CONCENTRATION LIMITS
SUMMARY TABLE

Table 1
Alternate Concentration Limits - Summary Table

Compound/Analyte	EPA MCLs (ug/L)	Groundwater PCLs (ug/L) ¹		Established ACLs (ug/L)								
		Human Health	Ecological	Bs	Bi	Bd	Cs	Ci	Cd	Gs	Gi	Gd
1,1-dichloroethane	not available	189,000	43,100	140	50	50	99	50	50	2,050	50	50
1,4-dioxane	not available	14,000	1,000,000	500	4,900	5,500	50,000	500	500	4,600	500	500
2,4-dimethylphenol	not available	4,490	775	50	120	78	84	50	50	50	50	50
2-butanone	not available	3,060,000	169,000	97	6,400	180	180,000	50	50	7,200	65	50
4-methyl-2-pentanone	not available	51,000	46,000	250	2,400	270	9,300	50	50	1,450	50	50
benzene	5	91.20	530	50	100	290	180	50	50	50	50	50
chloroethane	not available	2,030,000	43,100	2,600	130	110	1,600	50	50	4,900	50	50
ethylbenzene	700	9,350	1,400	850	7,760	1,900	8,000	700	700	13,300	700	700
styrene	100	12,200	2,510	100	260	230	214	100	100	100	100	100
tetrahydrofuran	not available	281,000	216,000	330	31,200	75,100	99,900	250	250	21,500	1,920	250
toluene	1,000	9,350	1,270	1,300	1,000	1,000	3,400	1,000	1,000	1,250	1,000	1,000
xylene (total)	10,000	105,000	10,000	10,000	13,100	21,400	31,400	10,000	10,000	67,700	10,000	10,000
4-methylphenol	not available	21,000	200	50	90	50	120	50	50	97	50	50
bis(2-ethylhexyl)phthalate	6	120	1,800	50	50	50	50	71	50	50	50	79
naphthalene	not available	2,440	not available	50	68	50	53	50	50	50	50	50
phenol	not available	606,000	34,100	50	52	50	50	50	50	220	50	50
acetonitrile	not available	22,100	185,000	250	13,000	250	50,000	250	250	2,500	250	250
acetophenone	not available	258,000	10,300	50	69	50	50	50	50	50	50	50
N,N-dimethylformamide	not available	1,620,000	1,200,000	250	203,000	1,550,000	383,000	8,500	250	210,000	3,900	250
beta-BHC	not available	2.06	1.80	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
arsenic	50	317	not available	50	1140	226	114	50	50	220	50	50
barium	2,000	236,000	5,000	2,000	2,000	3,660	2,000	2,000	2,000	2,000	2,000	2,000
cadmium	5	5,260	not available	5	14.9	16	12.2	5	5	5	6.1	33.2
chromium	100	4,210	not available	100	100	100	100	100	100	100	100	100
cobalt	not available	7,570,000	1,000	69.3	390	379	38.1	2.5	2.5	44.9	2.5	21.5
copper	1,300	not available	not available	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
lead	15	not available	not available	15	32.5	28.5	52.2	15	15	15	15	15
mercury	2	1,260	not available	5.9	2	2	2	2	2	2	2	2
nickel	not available	842,000	not available	12.8	86.7	91.6	117	2,590	10.7	149	16.6	9.9
vanadium	not available	118,000	600	4.3	11	13.6	136	15.8	2.5	11.7	8.9	28.3
zinc	not available	1,680,000	not available	73.5	141	253	156	243	105	115	75.5	218
2,3,7,8-TCDD TE	.03 ng/L	.000264 ng/L	200 ng/L	NC	NC	NC	NC	NC	NC	NC	NC	NC

Note 1 - Groundwater PCLs were obtained from Tables 5-21 and 6-28 in ENSR's ACL Demonstration Report, March 1993 with revisions through November 1996.

NC - Not calculated due to insufficient data.

MCL - Maximum Contaminant Level

ACL - Alternate Concentration Level

METCALF & EDDY, "Final Statistical Derivation of Alternate Concentration Limits (ACLs)", July 2000

ATTACHMENT 4
EXCEEDANCES OF ACLs, MCLs, and Sediment
Trigger Values (2008-2012)

Exceedances – ACLs

Round	SITE_ID	ANALYTE	RES_CHAR	RES_NUM	FLAG	SAMP_TYPE	UNITS	ACL	Note	Exceed
53	Cs	1,1-Dichloroethane	120	120		NX	ug/L	99		EXCEED
53	Bd	Tetrahydrofuran	85000	85000	J	FD	ug/L	75100		EXCEED
54	Bd	1,4-Dioxane	5790	5790		NX	ug/L	5500		EXCEED
55	Bi	Chloroethane	150	150	J	NX	ug/L	130		EXCEED
57	Bi	Chloroethane	230	230	D	NX	ug/L	130		EXCEED
58	Bi	Chloroethane	220	220	D	NX	ug/L	130		EXCEED
58	Gs	Chloroethane	6100	6100	D	NX	ug/L	4900		EXCEED
58	Bi	Tetrahydrofuran	35000	35000	D	NX	ug/L	31200		EXCEED
59	Gd	Mercury	3.0	3		NX	UG/L	2		EXCEED
60	Bi	Chloroethane	140	140		NX	ug/L	130		EXCEED
64	Bi	Chloroethane	130	130		NX	ug/L	130		EXCEED
65	Bd	1,4-Dioxane	9400	9400		NX	ug/L	5500		EXCEED
65	Ci	1,4-Dioxane	590	590		NX	ug/L	500		EXCEED
65	Bi	Chloroethane	300	300		NX	ug/L	130		EXCEED
65	Gs	Chloroethane	6000	6000		NX	ug/L	4900		EXCEED
65	Gs	Chloroethane	6000	6000		FD	ug/L	4900		EXCEED
66	Bi	Xylene (total)	15000	15000		NX	ug/L	13100		EXCEED
66	Bs	Lead	51	51		NX	ug/L	15		EXCEED

Exceedances – MCLs

Round	SITE_ID	ANALYTE	RES_NUM	FLAG	UNITS	SAMP_TYP	MCL	MCL Type	NOTES	EXCEED
54	Hd	Manganese	56.7		UG/L	NX		50 Secondary	MCL	EXCEED
54	Hi	Manganese	390		UG/L	NX		50 Secondary	MCL	EXCEED
57	Hd	Manganese	54.6		UG/L	NX		50 Secondary	MCL	EXCEED
57	Hi	Manganese	364		UG/L	NX		50 Secondary	MCL	EXCEED
60	Hi	Manganese	376		UG/L	NX		50 Secondary	MCL	EXCEED
61	Kd	Trichloroet	42.4		ug/L	NX		5 MCL & CT	MCL	EXCEED
61	Ki	cis-1,2-Dich	119		ug/L	NX		70 MCL & CT	MCL	EXCEED
61	Ki	Trichloroet	313		ug/L	NX		5 MCL & CT	MCL	EXCEED
61	Ks	Manganese	834		ug/L	NX		50 Secondary	MCL	EXCEED
61	Ks	Trichloroet	5.28		ug/L	NX		5 MCL & CT	MCL	EXCEED
61	Nd	Iron	490		ug/L	NX		300 Secondary	MCL	EXCEED
61	Nd	Manganese	518		ug/L	NX		50 Secondary	MCL	EXCEED
61	Ni	Iron	24200		ug/L	NX		300 Secondary	MCL	EXCEED
61	Ni	Manganese	974		ug/L	NX		50 Secondary	MCL	EXCEED
61	Ns	Manganese	423		ug/L	NX		50 Secondary	MCL	EXCEED
61	Pi	Manganese	107		ug/L	NX		50 Secondary	MCL	EXCEED
61	Ps	Manganese	111		ug/L	NX		50 Secondary	MCL	EXCEED
62	Kd	Trichloroet	28.2		ug/L	NX		5 MCL & CT	MCL	EXCEED
62	Ki	cis-1,2-Dich	96.2 J		ug/L	NX		70 MCL & CT	MCL	EXCEED
62	Ki	Trichloroet	298 J		ug/L	NX		5 MCL & CT	MCL	EXCEED
62	Ks	Iron	1510		ug/L	NX		300 Secondary	MCL	EXCEED
62	Ks	Manganese	934		ug/L	NX		50 Secondary	MCL	EXCEED
62	Nd	Iron	315		ug/L	NX		300 Secondary	MCL	EXCEED
62	Nd	Manganese	377		ug/L	NX		50 Secondary	MCL	EXCEED
62	Ni	Iron	18600		ug/L	NX		300 Secondary	MCL	EXCEED
62	Ni	Manganese	842		ug/L	NX		50 Secondary	MCL	EXCEED
62	Ns	Manganese	255		ug/L	NX		50 Secondary	MCL	EXCEED
62	Pd	Iron	310		ug/L	NX		300 Secondary	MCL	EXCEED
62	Pi	Manganese	51.6		ug/L	NX		50 Secondary	MCL	EXCEED
63	Hd	Manganese	62.1 E		ug/L	NX		50 Secondary	MCL	EXCEED
63	Hi	Manganese	386 E		ug/L	NX		50 Secondary	MCL	EXCEED
63	Hi	Manganese	379 E		ug/L	FD		50 Secondary	MCL	EXCEED
63	Kd	Trichloroet	14		ug/L	NX		5 MCL & CT	MCL	EXCEED
63	Ki	Trichloroet	94		ug/L	NX		5 MCL & CT	MCL	EXCEED
63	Ks	Manganese	474 E		ug/L	NX		50 Secondary	MCL	EXCEED
63	Nd	Iron	827		ug/L	NX		300 Secondary	MCL	EXCEED
63	Nd	Manganese	611 E		ug/L	NX		50 Secondary	MCL	EXCEED
63	Ni	Aluminum	62.4 N		ug/L	NX		50 Secondary	The MCL for	EXCEED
63	Ni	Iron	18700		ug/L	NX		300 Secondary	MCL	EXCEED
63	Ni	Manganese	688 E		ug/L	NX		50 Secondary	MCL	EXCEED
63	Ns	Manganese	291 E		ug/L	NX		50 Secondary	MCL	EXCEED
63	Pi	Aluminum	389 N		ug/L	NX		50 Secondary	The MCL for	EXCEED
63	Pi	Iron	736		ug/L	NX		300 Secondary	MCL	EXCEED
63	Pi	Manganese	187 E		ug/L	NX		50 Secondary	MCL	EXCEED
63	Ps	Manganese	57.7 E		ug/L	NX		50 Secondary	MCL	EXCEED
64	Kd	Trichloroet	51		ug/L	NX		5 MCL & CT	MCL	EXCEED
64	Ki	cis-1,2-Dich	91		ug/L	NX		70 MCL & CT	MCL	EXCEED
64	Ki	Trichloroet	220		ug/L	NX		5 MCL & CT	MCL	EXCEED
64	Ks	Manganese	320		ug/L	NX		50 Secondary	MCL	EXCEED
64	Nd	Iron	691		ug/L	NX		300 Secondary	MCL	EXCEED
64	Nd	Manganese	355		ug/L	NX		50 Secondary	MCL	EXCEED

64 Ni	Iron	15400	ug/L	NX	300	Secondary MCL	EXCEED
64 Ni	Manganese	579	ug/L	NX	50	Secondary MCL	EXCEED
64 Ns	Manganese	144	ug/L	NX	50	Secondary MCL	EXCEED
65 Kd	Iron	1960	ug/L	NX	300	Secondary MCL	EXCEED
65 Kd	Manganese	123	ug/L	NX	50	Secondary MCL	EXCEED
65 Kd	Trichloroet	69	ug/L	NX	5	MCL & CT MCL	EXCEED
65 Ki	cis-1,2-Dich	120	ug/L	NX	70	MCL & CT MCL	EXCEED
65 Ki	Iron	1360	ug/L	NX	300	Secondary MCL	EXCEED
65 Ki	Manganese	84	ug/L	NX	50	Secondary MCL	EXCEED
65 Ki	Trichloroet	260	ug/L	NX	5	MCL & CT MCL	EXCEED
65 Ks	Manganese	267	ug/L	NX	50	Secondary MCL	EXCEED
65 Nd	Iron	1220	ug/L	NX	300	Secondary MCL	EXCEED
65 Nd	Manganese	463	ug/L	NX	50	Secondary MCL	EXCEED
65 Ni	Iron	19700	ug/L	FD	300	Secondary MCL	EXCEED
65 Ni	Iron	21400	ug/L	NX	300	Secondary MCL	EXCEED
65 Ni	Manganese	663	ug/L	NX	50	Secondary MCL	EXCEED
65 Ni	Manganese	622	ug/L	FD	50	Secondary MCL	EXCEED
65 Ns	Manganese	210	ug/L	NX	50	Secondary MCL	EXCEED

66 Hi	Manganese	282	ug/L	NX	50	Secondary MCL	EXCEED
66 Hi	Iron	402	ug/L	NX	300	Secondary MCL	EXCEED
66 Hs	Iron	590	ug/L	NX	300	Secondary MCL	EXCEED
66 Kd	Trichloroet	52	ug/L	NX	5	MCL & CT MCL	EXCEED
66 Ki	Manganese	1120	ug/L	NX	50	Secondary MCL	EXCEED
66 Ki	Trichloroet	240	ug/L	NX	5	MCL & CT MCL	EXCEED
66 Ki	cis-1,2-Dich	110	ug/L	NX	70	MCL & CT MCL	EXCEED
66 Ks	Manganese	530	ug/L	NX	50	Secondary MCL	EXCEED
66 Nd	Manganese	414	ug/L	NX	50	Secondary MCL	EXCEED
66 Nd	Iron	634	ug/L	NX	300	Secondary MCL	EXCEED
66 Ni	Manganese	676	ug/L	NX	50	Secondary MCL	EXCEED
66 Ni	Iron	20300	ug/L	NX	300	Secondary MCL	EXCEED
66 Ns	Manganese	229	ug/L	NX	50	Secondary MCL	EXCEED

Exceedances – Sediment Trigger Values

Round	SITE_ID	ANALYTE	RES_NUM	UNITS	FLAG	SAMP_TYP	Trigger	EXCEED
53	Cd	Lead	10.5	ug/L		NX	1.62	EXCEED
59	Ci	Nickel	83	UG/L		NX	72	EXCEED
64	Bd	Selenium	39	ug/L		NX	5	EXCEED
64	Bi	Selenium	35	ug/L		NX	5	EXCEED
64	Ci	Selenium	11	ug/L		NX	5	EXCEED
64	Cs	Selenium	51	ug/L		NX	5	EXCEED
64	Cs	Selenium	54	ug/L		FD	5	EXCEED
65	Bd	Cadmium	4	ug/L		NX	1.34	EXCEED
65	Bi	Cadmium	3	ug/L		NX	1.34	EXCEED
65	Bs	Lead	2	ug/L		NX	1.62	EXCEED
65	Bs	Selenium	15	ug/L		NX	5	EXCEED
65	Cd	Selenium	9	ug/L		NX	5	EXCEED
65	Ci	Lead	2	ug/L		NX	1.62	EXCEED
65	Ci	Selenium	21	ug/L		NX	5	EXCEED
65	Cs	Cadmium	5	ug/L		NX	1.34	EXCEED
65	Cs	Lead	2	ug/L		NX	1.62	EXCEED
65	Cs	Selenium	62	ug/L		NX	5	EXCEED
65	Gd	Selenium	8	ug/L		NX	5	EXCEED
65	Gi	Selenium	8	ug/L		NX	5	EXCEED
65	Gs	Cadmium	2	ug/L		FD	1.34	EXCEED
65	Gs	Cadmium	3	ug/L		NX	1.34	EXCEED
65	Gs	Lead	2	ug/L		NX	1.62	EXCEED
65	Gs	Lead	2	ug/L		FD	1.62	EXCEED
65	Gs	Selenium	33	ug/L		NX	5	EXCEED
65	Gs	Selenium	36	ug/L		FD	5	EXCEED

66	Bd	Cadmium	7	ug/L		NX	1.34	EXCEED
66	Bd	Manganese	22700	ug/L		NX	12000	EXCEED
66	Bi	Cadmium	5	ug/L		NX	1.34	EXCEED
66	Bs	Lead	51	ug/L		NX	1.62	EXCEED
66	Cs	Cadmium	7	ug/L		NX	1.34	EXCEED
66	Cs	Cadmium	7	ug/L		FD	1.34	EXCEED
66	Cs	Lead	16	ug/L		FD	1.62	EXCEED
66	Cs	Lead	5	ug/L		NX	1.62	EXCEED
66	Gi	Lead	2	ug/L		NX	1.62	EXCEED
66	Gs	Cadmium	3	ug/L		NX	1.34	EXCEED

ATTACHMENT 5
FIVE-YEAR REVIEW SITE INSPECTION
CHECKLIST

Please note that "O&M" is referred to throughout this checklist. At sites where Long-Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program.

Five-Year Review Site Inspection Checklist (Template)

(Working document for site inspection. Information may be completed by hand and attached to the Five-Year Review report as supporting documentation of site status. "N/A" refers to "not applicable.")

I. SITE INFORMATION																
Site name: <u>WANDERSKI WASTE LAGOON</u>	Date of inspection: <u>4/3/13</u>															
Location and Region: <u>CANTON, CT / 1</u>	EPA ID: <u>CTD009774969</u>															
Agency, office, or company leading the five-year review: <u>EPA</u>	Weather/temperature: <u>SUNNY / ~40's</u>															
Remedy Includes: (Check all that apply) <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Landfill cover/containment (<u>lagoon</u>) <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls Groundwater pump and treatment Surface water collection and treatment <input checked="" type="checkbox"/> Other <u>Alternate Concentration Limits + compliance monitoring</u> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Monitored natural attenuation Groundwater containment Vertical barrier walls 																
Attachments: Inspection team roster attached <input checked="" type="checkbox"/> Site map attached																
II. INTERVIEWS. (Check all that apply)																
1. O&M site manager _____ <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;">Name</td> <td style="width: 25%; text-align: center;">Title</td> <td style="width: 25%; text-align: center;">Date</td> </tr> <tr> <td>Interviewed at site</td> <td>at office</td> <td>by phone</td> </tr> <tr> <td colspan="3">Phone no. _____</td> </tr> <tr> <td colspan="3">Problems, suggestions; Report attached _____</td> </tr> <tr> <td colspan="3">_____</td> </tr> </table>		Name	Title	Date	Interviewed at site	at office	by phone	Phone no. _____			Problems, suggestions; Report attached _____			_____		
Name	Title	Date														
Interviewed at site	at office	by phone														
Phone no. _____																
Problems, suggestions; Report attached _____																

2. O&M staff _____ <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;">Name</td> <td style="width: 25%; text-align: center;">Title</td> <td style="width: 25%; text-align: center;">Date</td> </tr> <tr> <td>Interviewed at site</td> <td>at office</td> <td>by phone</td> </tr> <tr> <td colspan="3">Phone no. _____</td> </tr> <tr> <td colspan="3">Problems, suggestions; Report attached _____</td> </tr> <tr> <td colspan="3">_____</td> </tr> </table>		Name	Title	Date	Interviewed at site	at office	by phone	Phone no. _____			Problems, suggestions; Report attached _____			_____		
Name	Title	Date														
Interviewed at site	at office	by phone														
Phone no. _____																
Problems, suggestions; Report attached _____																

NO RECORDS ON SITE.
 ALL RECORDS RENEWED
 @ EPA + IOR CTDEP PRIOR TO
 OSWER No. 9355.7-03B-P INSPECTION.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1.	O&M Documents O&M manual ✓ As-built drawings Maintenance logs Remarks _____	Readily available ✓ Readily available Readily available	Up to date Up to date Up to date N/A N/A N/A
2.	Site-Specific Health and Safety Plan Contingency plan/emergency response plan Remarks METCALF + EDDY/AECOM H+S PLAN INCLUDES PROVISIONS FOR EMERGENCIES	✓ Readily available Readily available	✓ Up to date Up to date N/A N/A
3.	O&M and OSHA Training Records Remarks _____	Readily available	Up to date (N/A)
4.	Permits and Service Agreements Air discharge permit Effluent discharge Waste disposal, POTW Other permits Remarks ALL OFF-SITE WASTE DISPOSAL IN COMPLIANCE WITH EPA REQUIREMENTS. MANIFESTS AVAILABLE.	Readily available Readily available Readily available Readily available	Up to date Up to date Up to date Up to date N/A N/A N/A N/A
5.	Gas Generation Records Remarks _____	Readily available	Up to date (N/A)
6.	Settlement Monument Records Remarks EPA / METCALF + EDDY LAEGSN SETTLEMENT MONUMENTS 2000-2004. DISCONTINUED IN 2005.	✓ Readily available	Up to date N/A
7.	Groundwater Monitoring Records Remarks AECOM CURRENTLY CONTRACTED BY CTDEP.	✓ Readily available	✓ Up to date N/A
8.	Leachate Extraction Records Remarks _____	Readily available	Up to date (N/A)
9.	Discharge Compliance Records Air Water (effluent) Remarks _____	Readily available Readily available	Up to date Up to date N/A N/A
10.	Daily Access/Security Logs Remarks _____	Readily available	Up to date (N/A)

C. Institutional Controls (ICs)		ICS ADDRESSED IN REPORT		
1. Implementation and enforcement				
Site conditions imply ICs not properly implemented	Yes	No	N/A	
Site conditions imply ICs not being fully enforced	Yes	No	N/A	
Type of monitoring (e.g., self-reporting, drive by) _____				
Frequency _____				
Responsible party/agency _____				
Contact _____				
Name	Title	Date	Phone no.	
Reporting is up-to-date				
	Yes	No	N/A	
Reports are verified by the lead agency				
	Yes	No	N/A	
Specific requirements in deed or decision documents have been met				
	Yes	No	N/A	
Violations have been reported				
	Yes	No	N/A	
Other problems or suggestions: Report attached				
<p>ICS NOT FULLY IMPLEMENTED NO OBSERVATIONS TO INDICATE PROPERTY OWNER IS VIOLATING REQUIRED LAND + BOUNDARY USE RESTRICTIONS.</p>				
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	NO SIGNS OF TRESPASSING.			
2. Land use changes on site				
	N/A			
Remarks	NO			
3. Land use changes off site				
	N/A			
Remarks	NOT OBSERVED.			
VI. GENERAL SITE CONDITIONS				
A. Roads				
	√Applicable	N/A		
1. Roads damaged				
Location shown on site map	√Roads adequate		N/A	
Remarks	ALL ROADS LEADING TO SITE ARE PASSABLE			

B. Other Site Conditions

Remarks BROKEN PLASTIC BARREL (OPEN, WATER INSIDE) AND OTHER DEBRIS OBSERVED ALONG (2132)B.M.W. NORTH OF LAGOON CAP. ALL APPEAR TO HAVE FLOATED IN FROM OTHER LOCATIONS (SEE MAPS)

PILE COVERED IN WHITE TARP + TIRES STILL AT EAST OF LAGOON. OBSERVED IN 2008, APPEARED TO BE MANURE.

VII. LANDFILL COVERS Applicable N/A (LAGOON CAP)

A. Landfill Surface

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

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

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

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

5. **Vegetative Cover** Grass Cover properly established No signs of stress
 Trees/Shrubs (indicate size and locations on a diagram)
 Remarks CAP COVER HADNT GREENED IN YET BUT COVERAGE VERY GOOD.

6. **Alternative Cover** (armored rock, concrete, etc.) N/A
 Remarks RIP RAP ALONG SOUTH OF CRIP HAS MODERATE VEGETATION GROWING THROUGH, DOES NOT APPEAR TO COMPROMISE INTEGRITY.

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

GABION WALL/BASKETS IN EXCELLENT SHAPE ALONG NORTHERN EDGE OF LAGOON CAP.

8.	Wet Areas/Water Damage <u>Wet areas</u> Ponding Seeps Soft subgrade Remarks _____	Wet areas/water damage not evident ✓ Location shown on site map Location shown on site map Location shown on site map Location shown on site map	Areal extent _____ Areal extent _____ Areal extent _____ Areal extent _____	MINOR RUTS ALONG SOUTH OF AGENCY CAP. DOES NOT IMPACT CAP.
9.	Slope Instability Areal extent _____ Remarks _____	Slides Location shown on site map	No evidence of slope instability	
B. Benches Applicable <u>N/A</u> (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)				
1.	Flows Bypass Bench Remarks _____	Location shown on site map	N/A or okay	
2.	Bench Breached Remarks _____	Location shown on site map	N/A or okay	
3.	Bench Overtopped Remarks _____	Location shown on site map	N/A or okay	
C. Letdown Channels Applicable <u>N/A</u> (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)				
1.	Settlement Areal extent _____ Remarks _____	Location shown on site map Depth _____	No evidence of settlement	
2.	Material Degradation Material type _____ Remarks _____	Location shown on site map Areal extent _____	No evidence of degradation	
3.	Erosion Areal extent _____ Remarks _____	Location shown on site map Depth _____	No evidence of erosion	

4.	Undercutting Areal extent _____ Remarks _____	Location shown on site map _____ Depth _____	No evidence of undercutting
5.	Obstructions Type _____ Location shown on site map _____ Size _____ Remarks _____	Areal extent _____	No obstructions
6.	Excessive Vegetative Growth No evidence of excessive growth Vegetation in channels does not obstruct flow Location shown on site map _____ Remarks _____	Type _____	Areal extent _____
D. Cover Penetrations <u>Applicable</u> N/A			
1.	Gas Vents Properly secured/locked _____ Evidence of leakage at penetration _____ Remarks _____	Active Functioning Needs Maintenance	Passive Routinely sampled Good condition Needs Maintenance
2.	Gas Monitoring Probes Properly secured/locked _____ Evidence of leakage at penetration _____ Remarks _____	Functioning Needs Maintenance	Routinely sampled Good condition Needs Maintenance <u>N/A</u>
3.	Monitoring Wells (within surface area of landfill) Evidence of leakage at penetration _____ Remarks _____	<u>Properly secured/locked</u> <u>Functioning</u> Needs Maintenance	<u>Routinely sampled</u> <u>Good condition</u> Needs Maintenance N/A
4.	Leachate Extraction Wells Properly secured/locked _____ Evidence of leakage at penetration _____ Remarks _____	Functioning Needs Maintenance	Routinely sampled Good condition Needs Maintenance <u>N/A</u>
5.	Settlement Monuments Remarks _____	Located Routinely surveyed	<u>N/A</u>

E. Gas Collection and Treatment		Applicable	(N/A)
1.	Gas Treatment Facilities Flaring Good condition Remarks _____	Thermal destruction Needs Maintenance	Collection for reuse
2.	Gas Collection Wells, Manifolds and Piping Good condition Remarks _____	Needs Maintenance	
3.	Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings) Good condition Remarks _____	Needs Maintenance	N/A
F. Cover Drainage Layer		Applicable	(N/A)
1.	Outlet Pipes Inspected Remarks _____	Functioning	N/A
2.	Outlet Rock Inspected Remarks _____	Functioning	N/A
G. Detention/Sedimentation Ponds		Applicable	(N/A)
1.	Siltation Areal extent _____ Siltation not evident Remarks _____	Depth _____	N/A
2.	Erosion Areal extent _____ Erosion not evident Remarks _____	Depth _____	
3.	Outlet Works Remarks _____	Functioning	N/A
4.	Dam Remarks _____	Functioning	N/A

H. Retaining Walls		<u>Applicable</u>	N/A	<u>GABION WALLS</u>
1.	Deformations Horizontal displacement _____ Rotational displacement _____ Remarks _____	Location shown on site map	<u>Deformation not evident</u>	
2.	Degradation Remarks <u>GABION WALLS/BASKETS APPEAR TO BE IN EXCELLENT SHAPE. FREE OF WEEDS.</u>	Location shown on site map	<u>Degradation not evident</u>	
I. Perimeter Ditches/Off-Site Discharge		Applicable	<u>N/A</u>	
1.	Siltation Areal extent _____ Remarks _____	Location shown on site map	Siltation not evident	
2.	Vegetative Growth Vegetation does not impede flow Areal extent _____ Remarks _____	Location shown on site map	N/A	
3.	Erosion Areal extent _____ Remarks _____	Location shown on site map	Erosion not evident	
4.	Discharge Structure Remarks _____	Functioning	N/A	
VIII. VERTICAL BARRIER WALLS		Applicable	<u>N/A</u>	
1.	Settlement Areal extent _____ Remarks _____	Location shown on site map	Settlement not evident	
2.	Performance Monitoring Type of monitoring _____ Performance not monitored Frequency _____ Head differential _____ Remarks _____		Evidence of breaching	

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 _____ _____		
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 Air stripping Filters Additive (e.g., chelation agent, flocculent) Others Good condition 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	Oil/water separation Carbon adsorbers	Bioremediation
2.	Electrical Enclosures and Panels (properly rated and functional) N/A Remarks	Good condition	Needs Maintenance
3.	Tanks, Vaults, Storage Vessels N/A Remarks	Good condition	Proper secondary containment Needs Maintenance
4.	Discharge Structure and Appurtenances: N/A Remarks	Good condition	Needs Maintenance
5.	Treatment Building(s) N/A Chemicals and equipment properly stored Remarks	Good condition (esp. roof and doorways)	Needs repair
6.	Monitoring Wells (pump and treatment remedy) Properly secured/locked All required wells located Remarks	Functioning Needs Maintenance	Routinely sampled Good condition N/A
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	

D. Monitored Natural Attenuation	
1. Monitoring Wells (natural attenuation remedy)	<p> <input checked="" type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> Functioning <input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition <input checked="" type="checkbox"/> All required wells located Needs Maintenance N/A Remarks _____ </p>
X. OTHER REMEDIES	
NA	
<p>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.</p>	
XI. OVERALL OBSERVATIONS	
A. Implementation of the Remedy	<p>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.).</p> <p> MONITORING WELLS, FENCE+GATE, LAGOON CAP, RIPRAP + GABIONS ALL APPEAR TO BE IN GOOD CONDITION. ONLY MINOR ITEMS REQUIRE FOLLOW UP: - WELL FD NEEDS A LOCK. - ADDRESS VEGETATION IN RIPRAP ALONG SOUTHERN PORTION OF CAP. </p>
B. Adequacy of O&M	<p>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.</p> <p> GROUNDWATER MONITORING SCHEDULE SHOULD BE TIGHTENED UP, AND OTHER ISSUES. </p>

C. Early Indicators of Potential Remedy Problems
<p>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.</p> <p>_____</p> <p>_____</p> <p>NONE</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
D. Opportunities for Optimization
<p>Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.</p> <p>_____</p> <p>NONE</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

SITE VISIT
4/13/2013

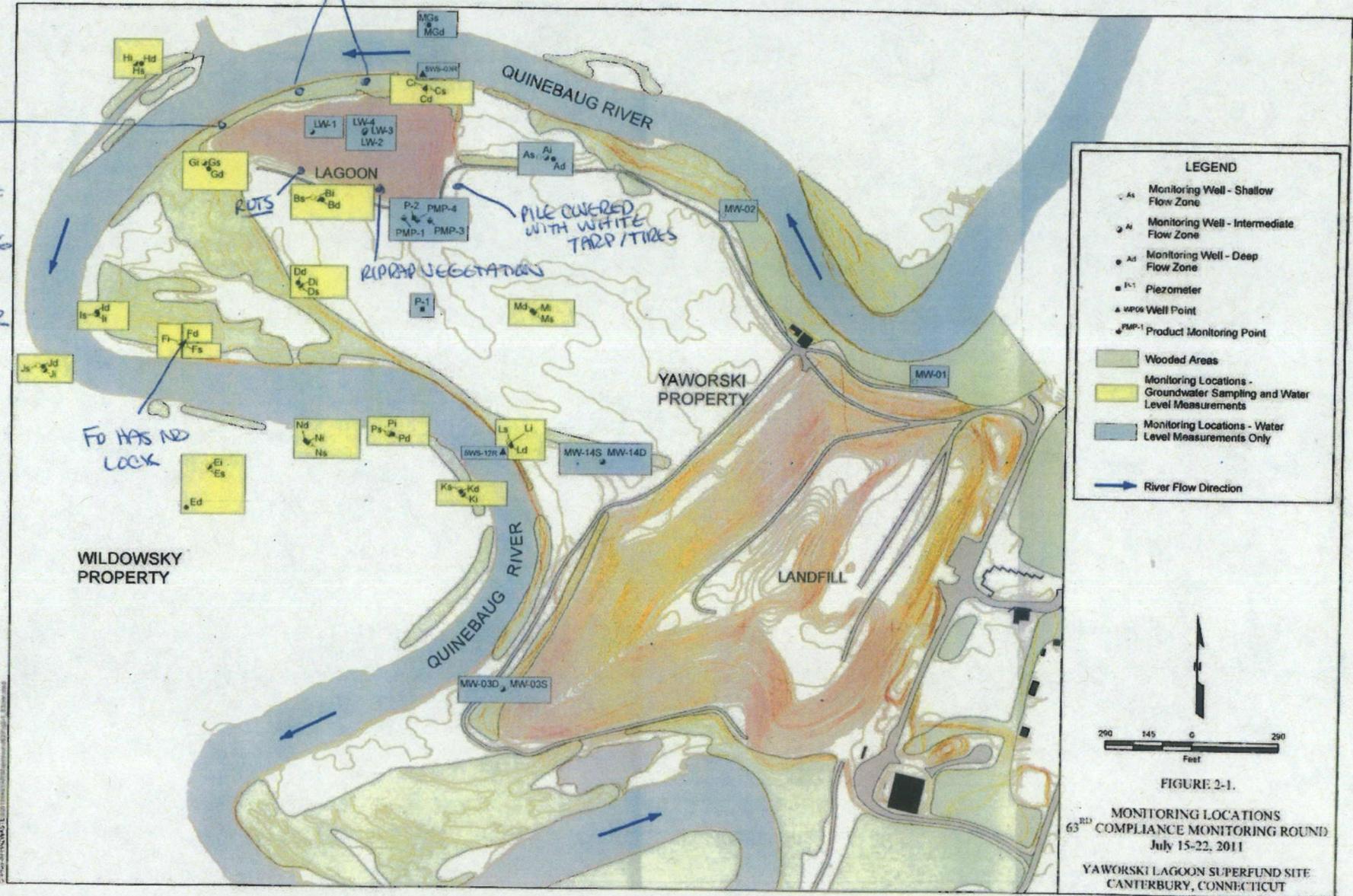
BROKEN PLASTIC BARREL (OPEN, WATER ONLY)
AND OTHER DETRITUS ALONG RIVERBANK,
APPEARS TO HAVE FLOATED IN FROM
OTHER LOCATION.

SOME
FENCE
DAMAGE
FROM
FALLING
TREES,
NOT
MAJOR

PILE COVERED
WITH WHITE
TARP/TIRES

RIPRAP VEGETATION

FO HAS NO
LOCK



LEGEND

- ▲ AS Monitoring Well - Shallow Flow Zone
- ▲ AI Monitoring Well - Intermediate Flow Zone
- ▲ AD Monitoring Well - Deep Flow Zone
- P-1 Piezometer
- ▲ WPS Well Point
- ▲ PMP-1 Product Monitoring Point
- Wooded Areas
- Monitoring Locations - Groundwater Sampling and Water Level Measurements
- Monitoring Locations - Water Level Measurements Only
- River Flow Direction

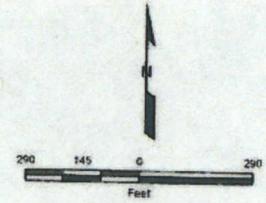


FIGURE 2-1.
MONITORING LOCATIONS
63RD COMPLIANCE MONITORING ROUND
July 15-22, 2011
YAWORSKI LAGOON SUPERFUND SITE
CANTERBURY, CONNECTICUT

ATTACHMENT 6
LIST OF DOCUMENTS REVIEWED

Record of Decision
Yaworski Lagoon Site, Canterbury Township, Connecticut
September 29, 1988

Consent Decree, Civil Action Nos. N-89-615(JAC) and H-89-870 (JAC)
Yaworski Lagoon Superfund Site
February 26, 1990

Construction Documentation Report, Lagoon Closure, Volumes I and II.
GZA GeoEnvironmental, Inc. (on behalf of Pervel Industries, Inc.)
March 1991

Remedial Design/Remedial Action Work Plan, Volumes I and II
(includes Post Closure Plan and Corrective Action Plan)
ENSR Consulting and Engineering (on behalf of Pervel Industries, Inc.)
March 1991

Final Remedial Construction Report Approval
EPA
March 31, 1992

Split Sampling Report for the October, 1992 Sampling Round
Metcalf & Eddy
February 1993

Stipulation and Order
October 20, 1995

Consent Agreement to Resolve Claims for Enforcement of 1990 Consent Decree,
Civil Action Nos. N-89-615(JAC) and H-89-870 (JAC)
Yaworski Lagoon Superfund Site
July 18, 1996

Five-Year Review Report, Type 1a
September 29, 1998

Timing of Remedial Design, Remedial Action, Long-Term RA and O&M
EPA Memo
August 12, 1999

Final Pre-Design Engineering Report
Metcalf & Eddy
December 1999

Final Alternate Concentration Limit (ACL) Demonstration Report, Volumes I and II
ENSR Consulting and Engineering
(on behalf of Pervel Industries, Inc. and the Bemis Company).
March 1993, updated by revisions of November 1995 and November 1996, approved
December 1999

Yaworski Human Health Risk Screening Evaluation for Surface Water and Sediments,
Based on First 20 Quarterly Monitoring Reports
EPA Memo
January 6, 2000

Sampling and Analysis Plan for Compliance Monitoring and Monitored Natural
Attenuation Sampling
Metcalf & Eddy
June 2000

Final Statistical Derivation of Alternate Concentration Limits (ACLs)
Metcalf & Eddy
July 2000

Consent Decree, Civil Action No. 3:99cv626 (PCD)
U.S. v. Yaworski, Inc., et. al.
Yaworski Lagoon Superfund Site
August 2, 2000

Consent Decree, Civil Action No. 3:96-CV-2420 (AVC)
U.S. v. Bemis Company, Inc. and Pervel Industries, Inc.
Yaworski Lagoon Superfund Site
August 11, 2000

Preliminary Close Out Report
Yaworski Lagoon Superfund Site
September 20, 2000

Interim Remedial Action Report
Yaworski Lagoon Superfund Site
September 28, 2001

Second Five-Year Review
Yaworski Lagoon Superfund Site
September 30, 2003

Trend analysis of polycyclic aromatic hydrocarbon (PAH) concentrations in sediments
from the Quinebaug River, Yaworski Lagoon Superfund Site, Canterbury Township, CT
ESAT – Region I, Lockheed Martin Information Technologies
August 17, 2004

Lagoon Settlement Monitoring Technical Memorandum
Metcalf & Eddy
January 31, 2005

Simplified Long-Term Monitoring Program for the Quinebaug River, Yaworski Lagoon
Superfund Site, Canterbury Township, CT
ESAT – Region I, Lockheed Martin Information Technologies
January 17, 2006

Review of Long-Term Monitoring Data for Sediment Samples Collected from the
Quinebaug River between 1999 and 2006 at the Yaworski Lagoon Superfund Site
ESAT – Region I, TechLaw, Inc.
August 22, 2008

Draft Work Plan for the Revised Long-Term Monitoring Program of the Quinebaug
River at the Yaworski Lagoon Superfund Site
ESAT – Region I, TechLaw, Inc.
March 12, 2009

Screening Risk Assessment for Point-of-Compliance Well ACL Exceedances at the
Yaworski Lagoon Superfund Site
March 24, 2009

PAH in long-term monitoring, Yaworski Lagoon site
May 4, 2009

Final Draft Work Plan for the Revised Long-Term Monitoring Program of the Quinebaug
River at the Yaworski Lagoon Superfund Site
ESAT – Region I, TechLaw, Inc.
June 18, 2009

Review of Mercury Data for Surface Water Samples Collected in October 2004 from the
Quinebaug River at the Yaworski Lagoon Superfund Site
ESAT – Region I, TechLaw, Inc.
June 24, 2009

Expanded Sediment Sampling Program to Provide Baseline Data for Future Long-Term
Monitoring of the Quinebaug River at the Yaworski Lagoon Superfund Site
ESAT – Region I, TechLaw, Inc.
August 27, 2009

Review of 2009 Sediment Analytical Data from the Quinebaug River and Proposal for
Continued Long-Term Monitoring at the Yaworski Lagoon Superfund Site
ESAT – Region I, TechLaw, Inc.
July 15, 2010

Easement for Grant of Access, Map 54, Lot 6
Randy Wildowsky to State of Connecticut
Town of Canterbury, Vol. 210, Page 0001
August 10, 2010

Declaration of Environmental Land Use Restriction and Grant of Easement,
Map 54, Lot 5
Stanley Wildowsky, Jr. to State of Connecticut
Town of Canterbury, Vol. 200, Page 0652
August 10, 2010

Declaration of Environmental Land Use Restriction and Grant of Easement,
Map 54, Lot 4
Ed's Garage, Inc. to State of Connecticut
Town of Canterbury, Vol. 210, Page 0014
August 10, 2010

Declaration of Environmental Land Use Restriction and Grant of Easement,
Map 54, Lot 3
Nancy E. MacGlaflin to State of Connecticut
Town of Canterbury, Vol. 212, Page 0471
January 4, 2011

Yaworski Lagoon Final Long-term Monitoring Recommendations
January 26, 2011

Yaworski Lagoon Superfund Site, July 2011 Performance Monitoring Round,
Sampling and Analysis Plan Addendum Memorandum
Metcalf & Eddy/AECOM
July 13, 2011

Memorandum of Agreement Between the U.S. Environmental Protection Agency and the
State of Connecticut Concerning Operation & Maintenance at the Yaworski Lagoon
Superfund Site in Canterbury, Connecticut
September 30, 2011

Post-Closure Monitoring Reports and Exceedance Reports
for Compliance Monitoring Rounds 2008-2011
Metcalf & Eddy/AECOM

E-mail – Exceedance reports for April 2008 (53rd CMR) through April 2012 (65th CMR)
AECOM
November 30, 2012

E-mail – Five years of Yaworski groundwater data through September 2012 (66th CMR)
AECOM
January 16, 2013

Final deliverable for reviewing the 2008-2012 groundwater long-term monitoring data
from the Yaworski Lagoon Superfund Site
ESAT – Region I, TechLaw, Inc.
April 23, 2013

E-mail – Yaworski, human health risk review of March 24, 2009 memo and sediment
data.
March 28, 2013

**ATTACHMENT 7
CT DEEP COMMENT LETTER,
DATED AUGUST 13, 2013**



August 13, 2013

Ms. Anni Loughlin
US Environmental Protection Agency
5 Post Office Square, Suite 100, Mail Code: OSR
Boston, MA 02109-3912

RE: State Comments Regarding Draft Fourth Five Year Review Report for Yaworski Lagoon Superfund Site, Canterbury, CT

Dear Ms. Loughlin:

The Remediation Division of the Bureau of Water Protection and Land Reuse of the Connecticut Department of Energy and Environmental Protection (DEEP) has received and reviewed the draft report entitled "Five-Year Review Report for Yaworski Waste Lagoon Superfund Site, Town of Canterbury, Windham County, Connecticut", dated July 2013 (the "Report"). The U.S. Environmental Protection Agency (EPA) prepared the Report. The Report describes the effort undertaken by EPA to determine whether the remedy selected by EPA for the Yaworski Lagoon Superfund site (the "Site") in 1988 remains protective of human health and the environment.

The Report concludes that the remedy remains protective of human health and the environment in the short term. The Report notes that institutional controls have been implemented to prevent use of groundwater on three off-site properties on the side of the Quinebaug River opposite the lagoon. However, institutional controls still need to be established on Yaworski-owned properties within the meander bend of the river. DEEP intends to continue to work with EPA and the Yaworskis to record institutional controls for the Yaworski-owned properties.

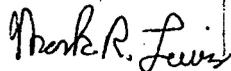
The Report states that the operating and maintenance monitoring schedule (O & M) requires improvement, and sets a date of September 30, 2013 for DEEP to achieve this milestone. The Report notes that DEEP has conducted three rounds of groundwater sampling since accepting responsibility for all O & M activities in September 2011, and that DEEP not yet conducted sampling in 2013. The Report notes that DEEP expects to issue a purchase order to resume sampling and may be able to resume sampling in August 2013. DEEP concurs with EPA's statements regarding the need to resume monitoring on a regular schedule. DEEP expects to be able to resume monitoring before the September 30, 2013 milestone dated specified in the Report.

DEEP provided comments to EPA regarding the Report in an e-mail to your attention from me dated August 6, 2013. EPA responded on August 7, 2013 with an e-mail to my attention from you. EPA revised the Report to incorporate the majority of the revisions suggested by DEEP. In a few cases, where EPA elected not to incorporate DEEP's suggested revisions, EPA's e-mail provided a detailed explanation of EPA's reasoning.

DEEP concurs with the conclusions of the Report, as revised in response to DEEP's comments. DEEP intends to continue to work with EPA and the Yaworskis to record institutional controls on the Yaworski-owned properties. DEEP appreciates the long-standing cooperative relationship between EPA and DEEP in working to ensure that the selected remedy remains permanently protective of human health and the environment.

Please contact me at (860) 424-3768 if you have any questions.

Sincerely,



Mark R. Lewis
Environmental Analyst 3
Remediation Division
Bureau of Water Protection and Land Reuse