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Five-Year Review Report

Fourth Five-Year Review Report
For
The Ottati & Goss/Kingston Steel Drum Superfund Site
Kingston
Rockingham County, New Hampshire 02919

February 2009

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LIST OF ACRONYMS AND ABBREVIATIONS

ACRONYM	DEFINITION
AOC	Area of Containment
ARAR	Applicable or Relevant and Appropriate Requirement
C&P	Cardboard and Paper
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COPC	Contaminant of Potential Concern
EMP	Environmental Monitoring Plan
ERA	Ecological Risk Assessment
FAWQC	Federal Ambient Water Quality Criteria
FS	Feasibility Study
HHRA	Human Health Risk Assessment
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
NCP	National Contingency Plan
NHDES	New Hampshire Department of Environmental Services
O&M	Operation and Maintenance
OU1	Operable Unit 1
OU2	Operable Unit 2
OU3	Operable Unit 3
OU4	Operable Unit 4
RA	Remedial Action
RAC	Remedial Action Contract
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation

ACRONYM	DEFINITION
RD	Remedial Design
ROD	Record of Decision
SVOC	Semivolatile Organic Compound
VOC	Volatile Organic Compound
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

This is the fourth five-year review for the Ottati & Goss/Kingston Steel Drum Site (the site). This review is required by statute because the selected remedy will, upon completion, leave hazardous substances, pollutants, or contaminants on site above levels that allow for unlimited use and unrestricted exposure. The trigger date for the initial five-year review was the initiation of the remedial actions at the site in November 1988. The trigger for this statutory review is December 29, 2003, the signature date of the previous five-year review report.

The site is located in the lower Merrimack River Valley/Coastal Plain portion of southeastern New Hampshire approximately eight miles north of Haverhill, Massachusetts, and approximately three miles south of the center of Kingston, New Hampshire (Figure 1, Attachment 1). The site is also known as the Ottati & Goss/Great Lakes Container Corporation Site.

The site is comprised of three distinct sections. The first is a 5.88 acre parcel referred to as the Great Lakes Container Corporation and Kingston Steel Drum (GLCC/KSD) portion of the site. Through an eminent domain action the GLCC/KSD portion of the site is currently owned by the State of New Hampshire. The second area is 29 acres and is owned by the BBS Realty Trust, Concord Realty Trust and John Peter Sebetes. One acre of the BBS Realty Trust parcel was leased to Ottati and Goss, Inc. (O&G), and now this entire parcel is referred to as the O&G portion of the site. The third section is a 23-acre marsh located east of the GLCC/KSD section, located between Route 125 and Country Pond. This parcel was purchased by the IMCERA Group Inc., in 1984 and the section is referred to as the Country Pond Marsh portion of the site. The three areas are shown on the site plan (Figure 2, Attachment 1).

Contaminants of concern in site groundwater include: volatile organic compounds (VOCs) (benzene, trichloroethylene, perchloroethylene and 1,2 dichloroethane, 1,4 dioxane) and possibly arsenic and nickel. Polychlorinated biphenyls (PCBs) were the primary contaminant of concern in the soil and sediments, although high levels of VOCs, semivolatile organic compounds (SVOCs) and metals were also found. Surface waters historically transported contaminants of concern (notably PCBs) east via surface water bodies into the Country Pond Marsh area.

The remedy selected in the 1987 Record of Decision (ROD) for the site includes the cleanup of groundwater to drinking water quality using pump and treat technology, building demolition and the clean up of soil and sediment to levels protective of human health and the environment under anticipated future site uses. The site cleanup consists of four operable units. Operable Unit 1 (OU1) refers to the Potentially Responsible Party (PRP) lead cleanup of soil at the Ottati & Goss (O&G) portion of the Site. Operable Unit 2 (OU2) refers to the PRP lead groundwater design. OU2 was terminated in 1993 and superseded by OU3. Operable Unit 3 (OU3), a Superfund lead effort, was designated to complete the groundwater remediation. Operable Unit 4 (OU4) was designated to complete the building demolition and remediation of soil and sediments at the GLCC/KSD and Country Pond Marsh portions of the site.

The soil remedy for the O&G portion of the site (OU1) was completed in 1989. However, the approximately 1-acre OU1 soil remediation at the O&G portion of the site (see Figure 2) was

excavated only to the relatively shallow groundwater table (less than 10 feet below ground surface). The VOC contaminated soils which may still be present below the groundwater table may not allow for unlimited and unrestricted use of this small area on the O&G portion of the site. The O&G portion of the site is not currently being used. The actions necessary to address the VOC contaminated soils which may be present below the water table in the approximately 1-acre area on the O&G portion of the site needs to be addressed in a future EPA decision document.

The building removal (OU4, Phase 1) was completed in 1994, followed by the soil and sediment remedy for the GLCC/KSD portion of the Site (OU4, Phase 2) in October 2002. Soil and sediments were remediated on site using thermal desorption or disposed off site. The GLCC/KSD portion of the site was remediated for commercial reuse only. Institutional controls (land use restrictions) are in place by the State to ensure that the future use of the GLCC/KSD portion of the site is restricted to commercial uses with no day care (see Attachment 3). Two relatively small areas just outside the perimeter of the GLCC/KSD portion of the site required cleanup to the site's 3 ppm residential soil cleanup level for PCBs. This goal was achieved in one of the areas. In the other area some residual PCB contamination greater than 3 ppm remains at a depth of 8 to 12 feet below ground surface (see Figure 7). Furthermore, the protectiveness of the current 3 ppm residential soil cleanup level for PCBs needs to be re-evaluated. Currently there is no residential use at any portion of the site. The actions necessary to address the small amount of PCB contaminated soil that exceeds the site's 3 ppm residential cleanup goal and the protectiveness of the current 3 ppm residential cleanup level for PCBs will be addressed in a future EPA decision document.

The 1987 ROD was amended in September 2007 to change the groundwater cleanup approach for OU3 from pump and treat technology to *in-situ* chemical oxidation. The first round of oxidant injection was performed in the Summer of 2008. Two more rounds of injection are currently planned (2009 and 2010). To control the future use of the site and to prevent groundwater use in the unrestricted areas of the site outside of the already restricted State-owned parcel (GLCC/KSD portion) until the groundwater cleanup goals have been achieved, the 2007 ROD amendment requires institutional controls in the form of deed restrictions and/or notices to establish land-use restrictions and a groundwater restriction area which would also be integrated into a State Groundwater Management Zone (GMZ). These institutional controls have not yet been obtained for the parcels outside the State-owned parcel. A Preliminary Close Out Report, which signifies that all construction activities have been completed at the site, was issued by the EPA in September 2008.

As part of this five-year review the fish ingestion risk of PCBs from Country Pond, downstream of the site, was recalculated using the most recent recommended ingestion rates from the "Child-Specific Exposure Factors Handbook" (EPA, 2008), and the most recent cancer oral slope factor and reference dose from EPA's Integrated Risk Information System (IRIS). Although neither of these values has changed since the last five-year review, the fish ingestion risk was not re-calculated as part of the last five-year review. The re-calculation indicates that the non-cancer risk of PCBs due to recreational fish ingestion (from Country Pond) has a hazard quotient (HQ) of approximately 3. However, it should be noted that the fish tissue data used in the updated risk

calculations was collected prior to the OU4 soil and sediment remediation and is considered to be outdated information. This five-year review recommends that additional surface water, sediment and fish tissue sampling at the outlet of Country Pond Marsh and in Country Pond should be performed.

This five-year review concludes that the remedial actions at all operable units are currently protective of human health and the environment. However, because the remedial actions at OU1, OU3 and OU4 have not yet achieved protectiveness in the long-term, the site is not protective of human health and the environment in the long-term until several follow-up actions are undertaken (see the Five-Year Review Summary Form that follows).

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name: Ottati & Goss/Kingston Steel Drum		
EPA ID: NHD990717647		
Region: 01	**State:** NH	**City/County**: Kingston/Rockingham
SITE STATUS		
NPL status: Final		
Remediation status: Operating		
Multiple OUs? YES	**Construction completion date:** September 19, 2008	
Has Site been put into reuse? No		
REVIEW STATUS		
Lead agency: EPA		
Author name: James M Brown		
Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA, Region 1 - New England	
Review period: December 2003 to December 2008		
Date(s) of Site inspection: September 16, 2008		
Type of review: Post-SARA		
Review number: Fourth		
Triggering action: Previous Five-Year Review Report		
Triggering action date: December 29, 2003		
/Due date *(five years after triggering action date)*: December 29, 2008		

Five-Year Review Summary Form, Continued

Issues:

1. To prevent the future use of site groundwater institutional controls are needed in the form of deed restrictions and/or notices to establish land-use restrictions and a groundwater restriction area which would also be integrated into a State Groundwater Management Zone (GMZ).

2. Two relatively small areas just outside the perimeter of the GLCC/KSD portion of the site required cleanup to the site's 3 ppm residential soil cleanup level for PCBs. This goal was achieved in one of the areas. In the other area some residual PCB contamination greater than 3 ppm remains at a depth of 8 to 12 feet below ground surface (see Figure 7). Furthermore, the protectiveness of the current 3 ppm residential soil cleanup level for PCBs needs to be re-evaluated. Currently there is no residential use at any portion of the site.

3. The approximately 1-acre OU1 soil remediation at the O&G portion of the site (see Figure 2) was excavated only to the relatively shallow groundwater table (less than 10 feet below ground surface). The VOC contaminated soils which may still be present below the groundwater table may not allow for unlimited and unrestricted use of this small area on the O&G portion of the site. The O&G portion of the site is not currently being used.

4. The fish ingestion risk for PCBs in Country Pond was recalculated using the most recent recommended ingestion rates from the "Child-Specific Exposure Factors Handbook" (EPA, 2008), and the most recent cancer oral slope factor and reference dose from EPA's Integrated Risk Information System (IRIS). Although neither of these values has changed since the last five-year review, the fish ingestion risk was not re-calculated as part of the last five-year review. The re-calculation indicates that the non-cancer risk of PCBs due to recreational fish ingestion (from Country Pond) has a hazard quotient (HQ) of approximately 3. However, it should be noted that the fish tissue data used in the updated risk calculations was collected prior to the OU4 soil and sediment remediation and is considered to be outdated information.

Recommendations and Follow-up Actions:

1. Obtain the required institutional controls.

2. The actions necessary to address the small amount of PCB contaminated soil that exceeds the site's 3 ppm residential cleanup goal and the protectiveness of the current 3 ppm residential cleanup level for PCBs will be addressed in a future EPA decision document.

3. The actions necessary to address the VOC contaminated soils which may be present below the water table in the approximately 1-acre area on the O&G portion of the site needs to be addressed in a future EPA decision document.

4. Additional surface water, sediment and fish tissue sampling at the outlet of Country Pond Marsh and in Country Pond should be performed.

Protectiveness Statement(s):

OU1 Statement:

The remedial action taken at OU1 (O&G soil) currently protects human health and the environment because the remediation of soil has been completed to cleanup levels that are protective of human health and the environment. The O&G portion of the site is not currently being used. However, in order for the remedy to be protective in the long-term the following action needs to be taken to ensure protectiveness. The approximately 1-acre OU1 soil remediation at the O&G portion of the site (see Figure 2) was excavated only to the relatively shallow groundwater table (less than 10 feet below ground surface). The VOC contaminated soils which may still be present below the groundwater table may not allow for unlimited and unrestricted use of this small area on the O&G portion of the site. The actions necessary to address the VOC contaminated soils which may be present below the water table in the approx. 1-acre area on the O&G portion of the site needs to be addressed in a future EPA decision document.

OU2 Statement:

There is no need for a protectiveness statement for OU2 because OU2 (PRP lead groundwater remediation) was terminated and replaced by OU3 (Superfund lead groundwater remediation).

OU3 Statement:

The remedy at OU3 (*in-situ* chemical oxidation in Areas A, B and C) currently protects human health and the environment because exposure pathways that could result in unacceptable risks are being controlled since: the site's groundwater is not currently being used; and select residential wells in close proximity to the site are routinely monitored by the NHDES to ensure that they are not affected by site related contaminants. However, in order for the remedy to be protective in the long-term the following actions need to be taken to ensure protectiveness: 1) to prevent the future use of site groundwater until groundwater cleanup goals have been reached, institutional controls will be implemented on parcels underlain by contaminated groundwater where institutional controls have not been established in the form of deed restrictions and/or notices to establish a groundwater restriction area which would also be integrated into a State Groundwater Management Zone (GMZ); and 2) a land-use restriction to prevent digging into contaminated substrates or disturbance of remedial components (including monitoring and injection wells) on the state-owned portion of the site (GLCC/KSD) and on areas of abutting properties. Institutional controls will also include a requirement to evaluate the potential risks via the vapor intrusion pathway prior to construction of any structures within this groundwater restriction area. The groundwater restriction area will include areas to the east of Route 125 and properties north and south of the State-owned portion of the site (GLCC/KSD) – where restrictions have already been established.

OU4 Statement:

The remedy at OU4 (soil and sediment excavation) currently protects human health and the environment because: soil and sediments have been excavated to cleanup levels that are considered protective for the anticipated future use of the property; the GLCC/KSD portion of

the site is currently unused and the property is surrounded by a fence; institutional controls are in place to limit the uses and exposures to residual soil contamination on the GLCC/KSD portion of the site (see Attachment 3); and the wetlands (Country Pond Marsh portion of the site) is also surrounded on three sides with a fence. However, the remedial action at OU4 may not protective in the long-term because in a limited area (see Figure 7) there are PCB contaminated soils 8 to 12 feet below ground surface that exceed the site's 3 ppm residential cleanup goal. Furthermore, the protectiveness of the current 3 ppm residential soil cleanup level for PCBs needs to be re-evaluated. Currently there is no residential use at any portion of the site. The actions necessary to address the small amount of PCB contaminated soil that exceeds the site's 3 ppm residential cleanup goal and the protectiveness of the current 3 ppm residential cleanup level for PCBs will be addressed in a future EPA decision document.

In addition, the fish ingestion risk of PCBs in Country Pond was recalculated using the most recent recommended ingestion rates from the "Child-Specific Exposure Factors Handbook" (EPA, 2008), and the most recent cancer oral slope factor and reference dose from EPA's Integrated Risk Information System (IRIS). Although neither of these values has changed since the last five-year review, the fish ingestion risk was not re-calculated as part of the last five-year review. The re-calculation indicates that the non-cancer risk of PCBs due to recreational fish ingestion (from Country Pond) has a hazard quotient (HQ) of approximately 3. However, it should be noted that the fish tissue data used in the updated risk calculations was collected prior to the OU4 soil and sediment remediation and is considered to be outdated information.

Site-Wide Protectiveness Statement:

The remedial actions at all operable units are currently protective of human health and the environment. However, because the remedial actions at OU1, OU3 and OU4 have not yet achieved protectiveness in the long-term, the site is not protective of human health and the environment in the long-term until several follow-up actions are undertaken.

The remedial action at OU1 is not protective in the long-term because the approximately 1-acre OU1 soil remediation at the O&G portion of the site (see Figure 2) was excavated only to the relatively shallow groundwater table (less than 10 feet below ground surface). The VOC contaminated soils which may still be present below the groundwater table may not allow for unlimited and unrestricted use of this small area on the O&G portion of the site. The actions necessary to address the VOC contaminated soils which may be present below the water table in the approx. 1-acre area on the O&G portion of the site needs to be addressed in a future EPA decision document.

The remedial action at OU3 is not protective in the long-term because the institutional controls needed to prevent the future use of site groundwater until groundwater cleanup goals have been reached are not currently in place. Institutional controls will be implemented in the form of deed restrictions and/or notices to establish a groundwater restriction area which would also be integrated into a State Groundwater Management Zone (GMZ) and a land-use restriction to prevent digging into contaminated substrates or disturbance of remedial components (including monitoring and injection wells) on the site and on areas of abutting properties. Institutional controls will also include a requirement to evaluate the potential risks via the vapor intrusion pathway prior to construction of any structures within this groundwater restriction area. The groundwater restriction area will include areas to the east of Route 125 and to the properties adjacent to the State-owned property (GLCC/KSD) to the north and south.

The remedial action at OU4 may not protective in the long-term because in a limited area (see Figure 7) there are PCB contaminated soils 8 to 12 feet below ground surface that exceed the site's 3 ppm residential cleanup goal. Furthermore, the protectiveness of the current 3 ppm residential soil cleanup level for PCBs needs to be re-evaluated. Currently there is no residential use at any portion of the site. The actions necessary to address the small amount of PCB contaminated soil that exceeds the site's 3 ppm residential cleanup goal and the protectiveness of the current 3 ppm residential cleanup level for PCBs will be addressed in a future EPA decision document.

In addition, the fish ingestion risk of PCBs in Country Pond was recalculated using the most recent recommended ingestion rates from the "Child-Specific Exposure Factors Handbook" (EPA, 2008), and the most recent cancer oral slope factor and reference dose from EPA's Integrated Risk Information System (IRIS). Although neither of these values has changed since the last five-year review, the fish ingestion risk was not re-calculated as part of the last five-year review. The re-calculation indicates that the non-cancer risk of PCBs due to recreational fish ingestion (from Country Pond) has a hazard quotient (HQ) of approximately 3. However, it should be noted that the fish tissue data used in the updated risk calculations was collected prior to the OU4 soil and sediment remediation and is considered to be outdated information.

Other Comments:

None

SECTION 1.0
INTRODUCTION

The purpose of this five-year review is to determine whether the remedies for the Ottati & Goss/Kingston Steel Drum Site continue to be 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, Five-Year Review reports identify issues found during the review, if any, and present recommendations to address them.

EPA Region I has conducted this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). Section 121(c) of CERCLA 42 USC § 9621(c) 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; 40 CFR §300.430(f)(4)(ii) 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.*

The Ottati & Goss/Kingston Steel Drum (O&G/KSD) Site consists of four operable units. Operable Unit 1 (OU1) refers to Potentially Responsible Party (PRP) lead cleanup of soil in the Ottati & Goss portion of the Site which was completed in 1989. Operable Unit 2 (OU2) refers to the PRP lead groundwater design which was not completed due to a settlement in 1993. In 1993, USEPA, the State of New Hampshire, and a large group of PRPs entered into a settlement which resulted in a Consent Decree that funded continued EPA and NHDES work at the site. As a result of the settlement, OU2 was terminated and was superseded by Operable Unit 3 (OU3), which was designated to complete the groundwater remediation. Operable Unit 4 (OU4) was designated to complete the remediation of soil and sediments in the Kingston Steel Drum (KSD) and Country Pond Marsh portions of the Site. The KSD portion of the Site is also called the Great Lakes Container Corporation (GLCC) portion of the Site in some documents. Throughout this review, the term GLCC/KSD will be used to refer to this portion of the Site. This five-year review addresses OU1, OU3, and OU4. As mentioned previously, OU2 was a PRP lead design for groundwater remediation that was not completed and was replaced by OU3.

This is the fourth five-year review for the Ottati & Goss/Kingston Steel Drum Site. This review was performed by EPA Region I- New England and is required by statute because the selected remedy will, upon completion, leave hazardous substances, pollutants, or contaminants on site above levels that allow for unlimited use and unrestricted exposure. The trigger date for the initial five-year review was the initiation of the remedial actions at the Site in November 1988. The trigger for this statutory review is December 29, 2003, the signature date of the previous Five-Year Review report.

SECTION 2.0
SITE CHRONOLOGY

The chronology of the site, including all significant events and dates is provided below in Table 1.

Table 1: Chronology of Site Events	
Event	**Date**
Drum reconditioning operations were conducted on the GLCC/KSD portion of the Site.	1959 through 1980
Two lagoons established for the disposal of caustic liquid waste from the drum reconditioning operations were backfilled on GLCC/KSD portion of the Site	1973 and 1974
A hazardous materials processing and storage facility was operated on the O&G portion of the Site	March 1978 through July 1979
EPA conducted emergency removal actions on the O&G portion of the Site, including the removal of approximately 4,000 drums	December 1980 through July 1982
Final listing on EPA National Priorities List	September 8, 1983
PRP removal actions on the GLCC/KSD portion of the Site, including the removal of drums and contaminated soil	June 1984 through June 1985
Completion of Remedial Investigation/Feasibility Study	August 1986
Record of Decision is issued for entire site	January 16, 1987
Several PRPs entered into a Consent Decree with EPA addressing the cleanup of soil on the O&G portion of the Site (OU1) and groundwater design and remediation (OU2)	November 1988
PRP lead cleanup of 4,700 cubic yards of contaminated soil at OU1 was completed	1988 through 1989
EPA, New Hampshire Department of Environmental Services (NHDES), and the remaining PRPs entered into a settlement which resulted in a Consent Decree that funded continued EPA and NHDES work at the Site. All claims which the United States had for injunctive relief (response activities) and costs (past and future) against the potentially responsible parties were resolved, with few exceptions. OU2 (PRP lead groundwater remediation) was terminated and replaced by OU3 (Superfund lead groundwater remediation).	Consent Decree entered December 22, 1993 (modified by the Court on July 19, 1994)
Completion of the first Five-Year Review for the Site.	December 1993

Table 1: Chronology of Site Events	
Event	**Date**
Under OU4, Phase 1, the large building which housed drum reconditioning operations on the GLCC/KSD portion of the Site was demolished. Hazardous materials and toxic substances were removed from the facility for disposal. Several underground storage tanks were also removed from this area.	September 1993 through February 1994
A preliminary design of the groundwater pump and treat system for OU3 was completed. Construction of the treatment system was put on hold to evaluate the potential for natural attenuation of the groundwater contamination.	September 1996
Completion of the second Five-Year Review for the site.	December 1998
An Explanation of Significant Differences (ESD) was issued which addressed a change in the treatment technology to be used to remediate OU4 Phase 2 contaminated soil and sediment. The ESD also restricted future use of the former GLCC/KSD property to commercial uses, and addressed an increase in the amount of soil to be excavated and treated. Cleanup levels for total PCBs were defined for various areas of the Site, based on an updated ecological risk assessment and the change in future land use of the former GLCC/KSD property to commercial use without day care. PCB residential cleanup standards were established for properties adjacent to the GLCC/KSD portion of the site.	September 28, 1999
OU4 Phase 2 Remedial Design was completed.	September 6, 2000
State of New Hampshire acquires the former GLCC/KSD property.	Fall 2000
Remediation of contaminated soil and sediment at OU4 and site restoration activities.	February 2001 through October 2002
EPA prepared a letter indicating that the remedial approach for the OU4 east/wetland soil had changed.	September 19, 2001
Issuance of an ESD addressing a modification in the handling of OU4 residual materials.	February 7, 2002
Final site inspection for OU4 Phase 2 construction completion	October 1, 2002
Final Remedial Action Report for OU4 Phase 2 is issued	March 28, 2003
Completion of third Five-Year Review for the site.	December 2003
EPA completes groundwater pump test, pilot scale groundwater treatability study and treatability study report.	November 2004 through February 2005
EPA conducted additional field investigations and evaluated alternatives to groundwater extraction and treatment.	October 2006 through June 2007.

Table 1: Chronology of Site Events	
Event	**Date**
State of NH records activity and land use restrictions on the GLCC/KSD portion of the site.	July 2007
EPA announces Proposed Plan to Amend the 1987 ROD.	July 2007
EPA amends the 1987 ROD to replace groundwater pump and treat with *in-situ* chemical oxidation.	September 2007
EPA completes the *in-situ* chemical oxidation design.	March 2008
EPA performs the first of three planned in-situ chemical oxidation injections.	July 2008 through September 2008.
EPA issues a Preliminary Close Out Report documenting the completion of all required construction activities at the site	September 2008

SECTION 3.0
BACKGROUND

3.1 PHYSICAL CHARACTERISTICS AND LAND AND RESOURCE USE

The Ottati and Goss/Kingston Steel Drum Site is located in the lower Merrimack River Valley/Coastal Plain portion of southeastern New Hampshire approximately eight miles north of Haverhill, Massachusetts, and approximately three miles south of the center of Kingston, New Hampshire (see Figure 1 in Attachment 1).

The Site is comprised of three distinct sections. The first is a 5.88 acre parcel referred to as the Great Lakes Container Corporation and Kingston Steel Drum (GLCC/KSD) area. The State of New Hampshire agreed to take this parcel by eminent domain, since no owner of record was available to implement the institutional controls required by the 1987 ROD and subsequent Explanation of Significant Differences. Subsequently, the State of New Hampshire registered a deed for taking the property in the fall of 2000. The second area is 29 acres and is owned by the Senter Transportation Company and Concord Realty Trust. One acre of this parcel was leased to Ottati and Goss, Inc. (O&G), and now this entire 29-acre parcel is referred to as the O&G portion of the Site. The third section is a 23-acre marsh located east of the GLCC/KSD section, located between Route 125 and Country Pond. This parcel was purchased by the IMCERA Group Inc., in 1984 and the section is referred to as Country Pond Marsh. The three areas are shown on the Site plan presented as Figure 2 in Attachment 1.

The Site is situated northwest of Country Pond, in a northwest-southeast trending valley. The Site straddles New Hampshire (NH) State Route 125. The Site slopes to the east, from a maximum elevation of 250 feet on a hill on the northwest side of the Site to 116 feet, the average elevation of Country Pond (Riordan, 1984). The valley floor east of Route 125 consists of a triangular shaped marsh of approximately 40 acres. The marsh extends into Country Pond, which is drained by two small brooks. To the west of NH Route 125, the Site is an upland area of approximately 35 acres that is drained by two small streams on the north and south sides of the valley (North and South Brook, respectively). The streams are channeled under Route 125 via a north and south culvert and discharge directly into the marsh. In addition, there are two small ponds (30 to 60 feet in diameter) located in the uplands of the Site. East of Route 125, a well defined channel for North Brook is evident through most of the marsh, from the culvert to the discharge point into Country Pond. The South Brook channel is less well defined after it flows through the south culvert, and eventually becomes indistinguishable a few hundred feet after discharging to Country Pond Marsh.

Country Pond has been estimated by the New Hampshire Fish and Game Department to have an area of approximately 255 acres and an average depth of 14 feet (GZA, 1986). There are three basins which comprise the pond (northwestern, eastern and southern). Each basin is adjacent to a central island. The Site is located adjacent to the northwestern basin.

Country Pond acts as a local hydraulic sink, receiving both surface and groundwater discharges. Streams flow into Country Pond on the north, south, east and west shores. The outflow is

located beneath a concrete bridge on the northeast side of the Pond (GeoTrans, 1986). The elevation of Country Pond is controlled by the Trickling Falls Dam, located approximately three miles downstream (GeoTrans, 1986). The elevation of the pond has historically ranged from 115 feet to 117 feet (GZA, 1986; GeoTrans, 1986).

Surficial (overburden) deposits in the vicinity of the Site include Pleistocene glacial deposits and recent alluvial and organic deposits. Recent deposits at the Site consist of organic deposits, alluvium and artificial fill materials which were remediated as part of OU4. Organic deposits consisting of a fibrous peat are present in several areas of the Site, including areas of Country Pond Marsh that were remediated as part of OU4.

Groundwater is found at the Site in the unconsolidated glacial deposits as well as the underlying bedrock. Groundwater exists in stratified drift deposits (sand and gravel) which form the overburden aquifer for most of the Site. Groundwater is also present in the bedrock underlying the Site. Groundwater is contained and transmitted in interstices such as joints and fractures in weathered and un-weathered bedrock.

3.2 HISTORY OF CONTAMINATION

From the late 1950's through 1967 the Conway Barrel and Drum Company (CDB) owned the Site and performed drum reconditioning operations in the GLCC/KSD portion of the Site. The reconditioning operations included caustic rinsing of drums and disposal of the rinse water in a dry well near South Brook. As a result of South Brook and Country Pond pollution, CDB established two leaching pits (lagoons) in areas removed from South Brook. Kingston Steel Drum, the operator of the facility from 1967 to 1973, continued the same operations as CDB.

In 1973 International Minerals and Chemicals Corporation (IMC) purchased the drum and reconditioning plant and operated it until 1976. The lagoons were reported to be filled in 1973 and 1974. The property was purchased in 1976 by the Great Lakes Container Corporation. Beginning in 1978, the Ottati and Goss Company operations consisted of "processed hazardous materials brought to the Site in drums." Heavy sludges from the wash tank and from drainings, and residues from incinerator operations at GLCC, were transported to the O&G portion of the site for processing. The O&G operations ceased in 1979. GLCC continued the drum reconditioning operation on its portion of the Site, until July 1980.

3.3 INITIAL RESPONSE

Beginning in 1980, a number of investigations and remedial activities have been conducted at the Site. From December 1980 to July 1982, EPA conducted emergency removal actions and processed and removed over 4,000 drums from the O&G portion of the Site. The site was added to the NPL in September 1983. On the GLCC/KSD portion of the Site, IMC removed drums and soil between July 1984 and June 1985. The total removal included: 12,800 tons of soil, drums, and metals; 101,700 tons of flammable sludge and 6,000 gallons of flammable liquid. The Remedial Investigations and Feasibility Study were completed in 1986. EPA's Record of Decision (ROD) for the site was signed in 1987.

3.4 BASIS FOR TAKING ACTION

Remedial Investigation/Feasibility Studies (RI/FS) were completed under a Cooperative Agreement with the New Hampshire Water Supply and Pollution Control Commission in 1986. The RI/FS conclusions were as follows:

- Soil throughout the Site was contaminated with volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), acid/base/neutral compounds (ABNs), metals and cyanide at high concentrations at numerous locations.

- Surface water in North and South Brooks and Country Pond contained dissolved VOCs.

- Sediments in North and South Brooks and the marsh contained VOCs and PCBs.

- Groundwater contaminated with VOCs, arsenic, nickel, iron and manganese was evident in several plumes. The plumes appeared to merge into one plume which migrated under Route 125 and the Country Pond Marsh, eventually discharging into Country Pond.

- There were no significant airborne contaminants.

SECTION 4.0
REMEDIAL ACTIONS

4.1 REMEDY SELECTION

The EPA ROD for the Site was signed on January 16, 1987. The ROD specified remedial activities to be implemented at the Site to mitigate contaminated soil, sediment, and groundwater. The ROD did not divide Site soil, sediment and groundwater into separate operable units, but the ROD did establish different PCB cleanup levels for soil vs. sediments. During 1988, several PRPs entered into a Consent Decree with EPA addressing the cleanup of soil on the O&G portion of the Site and groundwater remediation for the entire site. The 1988 Consent decree defined the O&G soil cleanup as operable unit one (OU1) and the groundwater remediation as OU2. Following a second Consent Decree in 1993 involving EPA, NHDES, and the remaining PRPs, two additional operable units, OU3 and OU4, were defined to complete the remediation. OU3 addresses the site groundwater contamination, while OU4 addresses the building demolition and the remaining soil and sediment contamination not addressed by the 1988 Consent Decree. The OU1 (cleanup of soil in the O&G area) had already been completed by 1993, and OU2 was superseded by OU3.

This section outlines the selected remedy for the three operable units at the site (OU1, OU3 and OU4) and the progress made to date in implementing the remedy. All of the cleanup activities required by the 1987 ROD and the two subsequent ESDs have been completed with the exception of the extraction and treatment of contaminated groundwater (OU3). As discussed below, the 1987 ROD was amended in September 2007 to change the groundwater cleanup strategy from extraction and treatment to *in-situ* chemical oxidation. The first of a planned three rounds of oxidant injection was completed in September 2008.

4.1.1 Operable Unit 1 (O&G Soil Cleanup)

The remedial objectives for OU1 were:

- Minimize the effects of source area contaminants on groundwater quality; specifically, remove contaminated soil to eliminate precipitation seepage through the source areas and contaminant infiltration into groundwater;
- Meet or exceed all applicable or relevant federal public health or environmental standards, guidance, and advisories; and
- Minimize potential impacts of implementing the selected source control remedy on adjacent surface waters and wetlands.

The selected source control remedy for OU1 (O&G soil) consisted of the following components:

- Excavation of contaminated soil with total VOC concentrations of 1 ppm or more (and 0.1 ppm or more for 1,2-dichloroethane, benzene, trichloroethylene, or perchloroethylene), and on-site treatment by aeration (low temperature thermal desorption);

- Reuse of treated soil as backfill;

- Grading and placement of four inches of sandy loam, followed by hydroseeding to restore grass;

- Off-site disposal of process residuals, stumps, logs, and drums uncovered during excavation; and

- Ambient air quality monitoring during excavation and on-site treatment, to ensure that off-site contaminant concentrations in air did not exceed the air quality standards established for the project.

4.1.2 Operable Unit 3 (Groundwater Cleanup)

The remedial objectives for OU3 are:

- Minimize risks to human health associated with potential future consumption of and direct contact with groundwater;

- Minimize migration of contaminants in groundwater such that groundwater discharging to Country Pond is not harmful to human health or aquatic ecological systems;

- Meet or exceed all applicable or relevant federal public health or environmental standards, guidance, and advisories; and

- Minimize potential impacts of implementing the selected management of migration alternative on adjacent surface waters and wetlands.

The remedial alternative for groundwater selected in the 1987 ROD consisted of a management of migration remedy, including installation of a groundwater extraction and treatment system at the Site. Groundwater extraction wells were to be located within source areas, along the eastern boundary of the GLCC/KSD property (*i.e.* along Route 125), and within the marsh area downgradient of the source areas. The 1987 ROD indicates that treated water was to be discharged to upgradient groundwater and possibly surface water. Groundwater extraction and treatment was specified to occur for a period of five years from the date of implementation. At that time, an evaluation of the technical feasibility of the remedy achieving target compound levels was to be conducted, if target levels had not been attained. Achievement of target levels was defined as the continuous detection of specified contaminants of concern at or below target concentrations for a period of three years at the Route 125 Site boundary and at selected on-site monitoring wells. The groundwater component of the remedy was implemented as OU3.

The OU3 management of migration remedy also included the following components:

- Monitoring on-site wetlands to ensure that groundwater extraction is not negatively impacting the wetlands (*e.g.* lowering water levels within the wetland);

- Initiating a long-term groundwater monitoring program of on-site and off-site monitoring wells; and

- Monitoring residential wells during implementation of the remedy. The frequency and parameters of the monitoring were to be determined during design. Residential wells have been monitored annually for VOCs by NHDES since 1992.

During September 1996, the design of the groundwater extraction and treatment system under OU3 was completed. However, based on site information and data generated since the issuance of the 1987 ROD and after the careful study of alternative groundwater cleanup technologies, the EPA believed that *in-situ* chemical oxidation (ISCO) would be a better approach to cleaning the groundwater at the Site than the groundwater extraction and treatment system selected in the 1987 ROD.

In September 2007, EPA amended the 1987 ROD (EPA, 2007a) to change the groundwater cleanup strategy from extraction and treatment to *in-situ* chemical oxidation. The major components of EPA's new cleanup plan includes: *in-situ* chemical oxidation (ISCO); environmental monitoring and institutional controls. Each component is briefly discussed below.

- ISCO involves the injection of an oxidant directly into the groundwater to break down contaminants into non-hazardous by-products such as water, salt, and carbon dioxide. The oxidant selected for this site is activated sodium persulfate. The goal for *in-situ* chemical oxidation is to achieve significant mass removal of contaminants, with the intent of eventually achieving Federal and State drinking water standards in the groundwater.

- Environmental monitoring will be performed from numerous existing and newly installed wells in order to evaluate the progress/success of the ISCO remedy. Monitoring of VOCs and 1,4-dioxane, as well as metals will be performed to assess contaminant destruction, determine progress towards attainment of remedial action objectives, and evaluate potential metals mobilization. Groundwater geochemical parameters, including: dissolved oxygen; pH; oxidation reduction potential; and conductivity, will also be monitored. Surface water and sediment samples will also be collected to monitor potential contaminant migration into Country Pond. This alternative also includes continued monitoring of select residential wells on an annual basis, consistent with the annual residential well monitoring program that NHDES has been performing since 1992.

- Institutional controls are administrative actions that minimize the potential for human exposure by restricting access and/or resource usage. Where not already established, institutional controls will be implemented in the form of the establishment of deed

restrictions and/or notices to establish a groundwater restriction area which would also be integrated into a State Groundwater Management Zone (GMZ) and a land-use restriction to prevent digging into contaminated substrates or disturbance of remedial components (including monitoring and injection wells) on the Site and on areas of abutting properties. Institutional controls will also include a requirement to evaluate the potential risks via the vapor intrusion pathway prior to construction of any structures within the groundwater restriction area. The groundwater restriction area will also include areas to the east of Route 125 and apply to the properties adjacent to the State-owned property to the north and south.

4.1.3 Operable Unit 4 (GLCC/KSD Soil and Sediment Cleanup)

The remedial objectives for OU4 are:

- Eliminate future risks to human health through direct contact with contaminants by removing contaminated soil and sediment;
- Minimize the effects of source area contaminants on groundwater quality; specifically, remove contaminated soil to eliminate precipitation seepage through the source areas and contaminant infiltration into groundwater;
- Meet or exceed all applicable or relevant federal public health or environmental standards, guidance, and advisories; and
- Minimize potential impacts of implementing the selected source control remedy on adjacent surface waters and wetlands.

The selected source control remedy for OU4 consisted of the following components:

- Excavation of approximately 5,000 cubic yards of PCB-contaminated soil and sediment from the upland area, South Brook, and the marsh areas and on-site treatment by incineration. Within the upland areas, soil with detected concentrations of PCBs above 20 ppm would be excavated and treated. For sediments within South Brook and the marsh areas, the ROD sets the action level for PCBs at 1 ppm. Post-ROD remedy changes in volumes, treatment methods, and cleanup levels were made via two ESDs.
- Excavation of an estimated 14,000 cubic yards of contaminated soil and sediment with total VOC concentrations of 1 ppm or more and on-site treatment by aeration (low temperature thermal desorption). Refer to Section 4.2.3 of this Report for description of remedy changes in the ESDs.
- Decontamination and removal of existing structures on site;
- Reuse of treated soil as backfill within the upland area;

- Regrading and revegetation of the upland areas to minimize the migration of and prevent direct contact with any residual contamination;

- Air emissions testing during on-site treatment to ensure compliance with applicable Resource Conservation and Recovery Act (RCRA) air emission standards;

- Ambient air quality monitoring during excavation activities to ensure that off-site contaminant concentrations in air do not exceed applicable standards; and

- Post-construction activities consisting of groundwater monitoring, site inspections, and site maintenance.

4.2 REMEDY IMPLEMENTATION

All of the OU1 and OU4 remedial activities were completed at the time of the last five-year review (EPA, December 2003) but are summarized below. As discussed in Section 4.1.2, in September 2007, EPA amended the 1987 ROD to change the OU3 groundwater cleanup strategy from extraction and treatment (pump and treat) to *in-situ* chemical oxidation (ISCO). The OU3 progress made since the last five-year review and the progress made to date in implementing the OU3 ISCO remedial activities are discussed below.

4.2.1 OU1 Remedy Implementation

Pursuant to a Consent Decree entered on November 13, 1988, three PRPs (General Electric Company, Solvents Recovery Service of New England, and Lilly Industrial Coatings, Inc.) performed response actions at the O&G portion of the site. In 1988 and 1989 these three PRPs excavated and treated about 4,700 cubic yards of soil contaminated with VOCs to a depth down to the water table at the O&G portion of the Site. The treatment was by thermal desorption (thermal aeration in the ROD). Additional information on the OU1 remedy implementation can be found in the December 2003 five-year review and previous five-year reviews for the site.

Site demobilization and Operable Unit 1 closure was completed on August 1, 1989.

4.2.2 OU3 Remedy Implementation

Prior to EPA's decision to change the OU3 component of the overall site cleanup plan from pump and treat to ISCO a number of activities were performed to finalize the design of the pump and treat system. From November 2004 through February 2005, EPA completed groundwater sampling, tests and studies whose primary goals were to obtain information needed to update the 1996 groundwater pump and treat design. The sampling, testing and studies included: groundwater monitoring in March 2004, June 2004 (M&E, 2005a) and December 2005 (M&E, 2006); a groundwater pump test and pilot scale groundwater treatability study in November/December 2004; and preparation of a groundwater treatability study report in 2005 (M&E, 2005b).

The groundwater monitoring data collected in 2004 indicated noticeable improvement in the site's groundwater quality since OU4 remedial actions were completed and the presence of three distinct residual source areas (M&E, 2005a). The first source area is centered on the state-owned portion of the site (Area A). The second area is in the southeast corner of the state-owned portion of the site (Area B). The third area is located north of the state-owned portion of the site on the BBS Realty Trust Parcel (Area C). Please refer to Figure 3, Attachment 1. The groundwater data from 2004 and 2005 are discussed in more detail in Section 6.3 of this Report.

In the fall of 2006, EPA decided that the pump and treat component of the remedy (OU3) selected in the 1987 ROD should be re-evaluated in light of the noticeable improvements in the site's groundwater and the presence of the three distinct source areas discussed above; and to consider advances in remedial technologies and overall knowledge of the site since the 1987 ROD was issued. In March and April 2007, EPA investigated Areas A and B using a combination of groundwater vertical profiling and soil vertical profiling. In November and December 2007, EPA investigated Area C. The vertical profiling effort for the three areas was designed to accomplish the following objectives:

- Define the vertical and horizontal extent of the VOC contamination within the three residual source areas (A, B and C).
- Determine the concentrations of 1,4-dioxane within the three residual source areas.
- Determine whether elevated concentrations of 1,4-dioxane are co-located with elevated total VOCs.
- Determine how contaminant concentrations correlate with subsurface soil permeability and organic content.

As mentioned previously (Section 4.1.2), in September 2007, the EPA issued an Amended Record of Decision to change the groundwater restoration component of the remedy (OU3) from groundwater pump and treat to *in-situ* chemical oxidation (ISCO) and monitoring. The rationale for this fundamental change to the original groundwater remedy is provided in the 2007 ROD Amendment (EPA 2007a). The components of the ISCO remedy are discussed in Section 4.1.2 of this Report.

The results of the vertical profiling effort in the three residual source areas and the final design of the ISCO remedy are provided in the Basis Of Design Report (M&E, 2008). In July 2008, EPA started construction of the numerous ISCO injection wells within the three residual source areas. The chemical oxidant (activated sodium persulfate) was delivered into the groundwater using a combination of permanent wells and temporary direct push injection wells. As of September 12, 2008, all the permanent injection wells were installed and oxidant was injected into all the permanent and direct push injection wells. A total of 253 injection wells were installed (119 in Area A, 80 in Area B and 54 in Area C). Approximately 374,100 pounds of sodium persulfate was injected into the subsurface (204,700 pounds in Area A, 127,100 pounds in Area B and 42,300 pounds in Area C). It is anticipated that two more rounds (Summer 2009 and Summer 2010) of oxidant injections of similar magnitude to the first round will be needed to achieve the remedial goals established for the Site.

Additional groundwater monitoring wells were also installed in the summer 2008. Data to be collected from these additional monitoring wells along with previously installed monitoring wells will be used to measure the performance of the ISCO injections and to eventually verify that the groundwater remedial goals have been achieved. The first ISCO performance monitoring event is schedule for January 2009.

The institutional controls required by the September 2007 amended ROD still need to be implemented in the form of the establishment of deed restrictions and/or notices to establish a groundwater restriction area which would also be integrated into a State Groundwater Management Zone (GMZ) and a land-use restriction to prevent digging into contaminated substrates or disturbance of remedial components (including monitoring and injection wells) on the state owned property (GLCC/KSD portion of the site) and on areas of abutting properties. The institutional controls will also need to include a requirement to evaluate the potential risks via the vapor intrusion pathway prior to construction of any structures be contemplated within the groundwater restriction area. These institutional controls will be obtained during the next five-year review period.

The EPA issued a Preliminary Close Out Report (PCOR) for the site in September 2008 (EPA, September 2008). The PCOR documents that all the construction activities required for the site (OU1, OU3 and OU4) have been completed.

4.2.3 OU4 Remedy Implementation

Phase 1 of the OU4 remedial action (building demolition) was completed in February 1994 and included the following demolition activities: 1) asbestos abatement; 2) building debris removal and disposal; 3) sampling and analysis; 4) utilities removal; 5) removal of above-ground and underground storage tanks; 6) contaminated soil and sediment disposal; and 7) installation of a high-density polyethylene cover over the southeast portion of the former building (ADL, 1994).

Environmental Chemical Corporation (ECC) was contracted by the U.S. Army Corps of Engineers – New England District (USACE) to complete Phase 2 of the OU4 remedial action, which included the OU4 soil and sediment excavation, LTTD treatment, and restoration activities. Between August 2001 and June 2002, 72,347 tons of PCB and VOC-contaminated soil (not including oversized material > 2-inches), were excavated from the GLCC/KSD area of the Site and treated in an on-site LTTD plant. Prior to treatment, debris (including drums, concrete, metal, wood, timbers, and tires) was removed from the soil and disposed off site. Prior to disposal, representative wipe samples were collected from the debris to confirm that PCB concentrations were not above disposal facility acceptance criteria.

Between October 2001 and February 2002, approximately 9,143 tons of sediment from the Country Pond Marsh were excavated, transported and disposed of as non-hazardous waste at a RCRA Subtitle D disposal facility. Approximately 492 tons of sediment were transported and disposed of as PCB hazardous waste (Toxic Substances Control Act) at a RCRA Subtitle C landfill facility. Confirmatory soil samples from the excavation floor verified the removal of contaminated soil and sediment to the required level (no greater than 1 ppm). The Country Pond

Marsh remediation was divided into two areas, a thirty-inch deep excavation area and a six-inch deep excavation area. A total of six acres of wetland in Country Pond Marsh were remediated and restored.

Site restoration activities included backfilling, grading, seeding, vegetative plantings, and fence installation. Remediated areas of Country Pond Marsh were reconstructed and South Brook, which had been diverted during the remediation, was restored between May 2002 and September 2002. In June 2002, thirteen groundwater monitoring wells were installed at ten locations at the site. Other restoration activities included removing utilities, construction of permanent access roads, installation of a new chain-link fence with gates, reseeding, and removal of the South Brook diversion swale and recharge galleries. The OU4 remedial action is described more fully in the Remedial Action Report (ECC, 2003).

Monitoring of the restored Country Pond Marsh from 2003 to the present clearly documents establishment of a productive and diverse plant community, dominated almost exclusively by herbaceous hydrophytic (wetland) plants. Hydrology, hummock and hollow topography, and soils are adequate to support development of a diverse, functional, wetland community. Conditions appear favorable for eventual development of a forested wetland, the ultimate objective of the restoration effort.

In July 2007 the State of New Hampshire recorded a notice to the chain of title for the GLCC/KSD property to document the land activity and use restrictions (AURs) required to maintain the protectiveness of the soil remedy and to establish institutional controls over the 5.89 acres of the property (see Attachment 3). The AURs allow for commercial or industrial uses provided soils are not disturbed at a depth greater than six feet. Use of the property as a residence, school, nursery, recreational area or any other use at which a child's presence is likely or intended is not permitted. Installation of groundwater wells or any removal or exposure to groundwater (except for remediation purposes) is not permitted unless such activity is first evaluated and approved by the EPA and NHDES.

On a small portion of the BBS Realty property soil was to be cleaned up to the site's residential cleanup goal for PCBs (3ppm). No institutional controls were to be required. However, confirmatory sampling showed that in a limited area some PCBs were left above the 3ppm cleanup goal after remediation (see Section 7.1 of this Report). This remaining PCB contamination along with an assessment of the protectiveness of the site's residential PCB cleanup goal will be addressed in a future EPA decision document.

4.3 OPERATION AND MAINTENANCE

There are no treatment systems on Site that require on-going operation and maintenance. The state of New Hampshire owns the GLCC/KSD portion of the site and maintains the property (primarily mowing the grass and maintaining access restrictions). The restored Country Pond Marsh wetland area requires monitoring and maintenance until the restoration is complete. The monitoring and maintenance activities include:

- Monitoring of the vegetation already established to insure progress towards the establishment of a red maple wetland.

- Yearly monitoring of invasive species, including *Phragmites*, purple loosestrife and oriental knotweed. Monitoring should continue for five years after *Phragmites* is last observed.

- Continued eradication of invasive species using Rodeo or other suitable herbicide and /or hand pulling of plants.

- Maintain weed and rodent control barriers until trees are large enough to successfully compete with herbaceous vegetation.

- Plant supplemental trees and shrubs if tree/shrub survivorship is low and is likely to fail to meet the tree shrub performance standard of 50 percent tree/shrub cover by 2011.

Two more rounds of oxidant injections for the OU3 component of the remedy are currently planned (2009, 2010). The two additional rounds of injections will be of similar magnitude to the first round described in Section 4.2.2 of this Report. Groundwater monitoring of select wells is being performed to evaluate the effectiveness of the oxidant injections. Surface water monitoring is performed to ensure there are no adverse impacts to nearby surface waters during the implementation of the *in-situ* chemical oxidation groundwater remedy. Routine site-wide groundwater monitoring and the residential groundwater well monitoring program will continue to be performed until the groundwater cleanup goals for the site have been achieved.

SECTION 5.0
PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

In the last Five-Year Review dated December 2003, EPA certified that the remedial actions at all operable units are protective or will be protective upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

At the time of the last Five-Year Review all of the construction activities required by the 1987 ROD were complete with the exception of the OU3 groundwater pump and treat system. As discussed in Section 4 of this Report the 1987 ROD was amended in September 2007 to change the OU3 component of the overall site cleanup plan from pump and treat to *in-situ* chemical oxidation. All of the OU3 construction activities were completed by September 2008. EPA issued a Preliminary Close Out Report for the Site in September 2008 (EPA, September 2008). Additional details regarding the construction activities since the last Review can be found in Section 4 of this Report.

The last Five-Year Review identified three issues that required follow-up actions. Those issues and the actions taken since the last Review are discussed below.

5.1 STATUS OF ISSUES THAT REQUIRED FOLLOW-UP ACTIONS

Issue 1: Future use limitations on the former GLCC/KSD property to restrict uses to commercial (excluding day care) have not yet been implemented.

In July 2007 the State of New Hampshire recorded a notice to the chain of title for the state-owned GLCC/KSD property to document the land activity and use restrictions (AURs) required to maintain the protectiveness of the soil remedy and to establish institutional controls over the 5.89 acres of the property. The AURs allow for commercial or industrial uses provided soils are not disturbed at a depth greater than six feet. Use of the property as a residence, school, nursery, recreational area or any other use at which a child's presence is likely or intended is not permitted. Installation of groundwater wells or any removal or exposure to groundwater (except for remediation purposes) is not permitted unless such activity is first evaluated and approved by the EPA and NHDES. In a fifth amendment to the State Superfund Contract between the State and EPA, the State agreed that if they ever transferred title to the GLCC/KSD property, the State would retain a Grant of Environmental Use Restrictive Covenants to ensure that the institutional controls are maintained.

Issue 2: Remedial actions to address groundwater contamination at the Site have not yet been implemented (i.e., the OU3 remedy is not completed).

In September 2007, the EPA issued an amendment to the 1987 ROD which changed the OU3 groundwater cleanup plan from pump and treat to *in-situ* chemical oxidation (ISCO). The ISCO design was completed in March 2008. The first of three planned rounds of injections were

completed in September 2008. The second and third rounds are currently planned to take place during 2009 and 2010.

Issue 3: A site-wide risk assessment is needed to more thoroughly evaluate remedy protectiveness under probable future commercial and residential Site uses. Consideration of additional analytes (other than PCBs and VOCs), and possibly additional sampling, are needed to support the site-wide risk assessment.

A final site-wide risk assessment is a routine project activity and it will be performed after the OU3 groundwater cleanup plan has been implemented and when EPA believes the interim cleanup goals established for the site have been achieved. Performing the site-wide risk assessment using additional analytes (other than PCBs and VOCs) and possibly additional sampling to support the final site-wide risk assessment will be considered.

SECTION 6.0
FIVE-YEAR REVIEW PROCESS

This section describes the activities performed during the five-year review process and provides a summary of findings.

6.1 COMMUNITY NOTIFICATION AND INVOLVEMENT

A summary of the most significant community involvement over the past five years is provided below:

In July 2007, EPA issued a Proposed Plan to amend the 1987 ROD. The Proposed Plan presented EPA's proposal to change the groundwater cleanup plan from pump and treat technology to *in-situ* chemical oxidation. A public informational meeting was held on August 2, 2007. A public hearing was held on August 23, 2007. Following issuance of the amended ROD in September 2007 and approval of the *in-situ* chemical oxidation design in March 2008, EPA met with local public safety officials in July 2008 to discuss the details of the *in-situ* chemical oxidation operations and to address their concerns.

In October 2008, EPA placed an advertisement in a local newspaper announcing the start of the fourth Five-Year Review for the Site. Soon after the review and approval of this five-year review report, a notice will be placed in a local newspaper announcing that the fourth five-year review report is complete and that it is available to the public at the following Site repositories:

Nichols Memorial Library
169 Main Street
Kingston, NH 03848
(603) 642-3521

EPA – Region 1 (New England) Records Center
One Congress Street
Boston, Massachusetts 02114-2023

Hours: Monday – Friday, 10:00 am – noon and
2:00 pm – 5:00 pm

6.2 DOCUMENT REVIEW

This five-year review consisted of a review of relevant documents for the site including the RODs, two Explanation of Significant Differences, the Remedial Action Reports for OU1 and OU4, PCOR, site groundwater monitoring data and the three previous five-year review reports. See Attachment 2 for a list of documents that were reviewed.

6.3 DATA REVIEW

Since the last five-year review there have been four site-wide groundwater monitoring events (March 2004, June 2004, December 2005 and June 2008). The 2004 and 2005 sampling events were performed to collect data to support the design of the original OU3 groundwater pump and treat system. The 2004 and 2005 groundwater data are summarized in this section. An updated hydrogeology discussion for the site is also provided in this section. The 2008 site-wide groundwater sampling event was performed just prior to the ISCO injections as a baseline to allow for a comparison of pre and post injection groundwater quality. The 2008 groundwater data has not yet been summarized and therefore are not currently available for review. Other data collected since the last five-year review but not discussed in this five-year review have been summarized in the ISCO Basis of Design Report (M&E, 2008).

Confirmatory soil and sediment sampling that was performed as part of the OU1 and OU4 remedial actions was summarized in the last five-year review for this site. A summary of the results of the most recent round of residential well monitoring by NHDES are provided in this section.

6.3.1 Hydrogeology

Groundwater generally flows from west to east, in somewhat of an arc shape, across the portions of the site located west of Route 125; eventually discharging to the marsh and Country Pond, located east of Route 125. Figure 3 presents groundwater elevation contours from water level measurements taken on December 13, 2007. Groundwater flows into the site from the southwest, traveling under South Brook, and from the northwest, along the North Brook drainage; however, the latter is not as well illustrated on Figure 4 due to the scale and general focus of the map. Flow onto the site generally has a higher gradient than that leaving the site to the east. The change in gradient is likely due to the increase in transmissivity related to the thicker overburden deposits to the east. Measurements in paired overburden wells along North and South Brooks and along the central portion of the site indicate that flow is generally downward. This suggests that there is little discharge to the brook systems from the deeper aquifer system, west of Route 125, and that flow is generally more lateral with discharge occurring east of Route 125.

Groundwater exists in the stratified drift deposits left by glacial retreat from this area; although a large quantity of sand and gravel from these deposits have been mined from the site (predominantly from the western portion), a depth of 10 to 45 feet of glacial deposits still exists. At the Site, these deposits tend to deepen to the east. East of NH Route 125, the stratified deposits are overlain by peat and organic matter. To the west of Route 125, boring logs compiled by Metcalf and Eddy from the installation of the ME- (June 2002), MEOW- (May 2004), and ME-C (November 2007) series monitoring wells, indicate that there is some variability in the textures of the stratified sand and gravel deposits in the saturated zone, particularly in the area between monitoring well cluster GZ-11 and NH Route 125 (Figure 3). Below five to eight feet from the ground surface, the textures range from fine-medium sand to coarse sand and gravel. Finer texture deposits appear to be located in the southeast corner of the

site, defined by monitoring wells MEOW-4 and ME-4 and by South Brook, while to the north and northeast, the deposits are coarser, more in the medium to coarse sand and gravel textures (MEEW-B, ME-1, ME-C09, ME-CO8, ME-C07). Above five to eight feet below ground surface, the textures are somewhat more consistent across the fenced in portion of the site due to the OU4 source removal action in 2002 (ECC, 2003), during which the top five to eight feet of soil (the vadose zone) was removed, remediated via incineration and thermal aeration, and replaced. The replacement of the treated soils included compaction of the material before placing a final loam and topsoil cover over the Site.

During the evaluation and construction of an infiltration basin for the groundwater pump and treat pilot test in November of 2004, it was noted that the permeability of the treated soils was poor and that after heavy rains most of the infiltrating water remained in the upper two feet consisting of loam and topsoil. Additionally, the infiltrated rain water was observed to move laterally along the contact zone between the loam and the compacted treated soils (~two feet below grade). North of the Site, along North Brook and areas just south of the North Brook (Area C) the top five to eight feet tends to be variable fine sands and fill/disturbed soils.

6.3.2 2004 Groundwater Monitoring Rounds

In March 2004, M&E conducted groundwater monitoring for EPA under Remedial Action Contract (RAC) Work Assignment No. 152-RDRD-0105 (EPA Contract No. 68-W6-0042), to obtain groundwater data to be used in development of the pilot-scale ex-situ treatability study and pumping test to be performed later that year. The purpose of the treatability study and pumping test was to collect data needed to update the 1996 groundwater extraction system and treatment design for post-source removal plume conditions. Low-flow sampling methods were used rather than PDBs (Passive Diffusion Bags), so that results could be obtained for both VOC and non-VOC analytes. Selected samples were analyzed for PCB homologs, target analyte list (TAL) metals, and/or 1,4-dioxane in addition to VOCs to provide data needed for the treatability study design.

A supplemental groundwater monitoring event was performed in late June 2004 to provide additional groundwater data for use in planning the treatability study and pumping test. Six new monitoring wells (MEOW-1 through MEOW-6) were installed in June 2004 to observe drawdown during the pumping test and help locate the extraction well for the test. The locations of the new wells made them suitable as design basis wells for the treatability study. Hence, these wells were sampled in late June 2004 with the samples undergoing analysis for VOCs, metals, and 1,4-dioxane. A subset of wells from the March 2004 sampling round were also sampled in late June 2004 to help fill the data gap with respect to 1,4-dioxane that was noted during review of the March 2004 data. Specifically, reporting limits for 1,4-dioxane were elevated in certain samples because of sample dilution made necessary by the elevated concentrations of VOCs present in the samples. Because the elevated reporting limits were higher than the treatment objective for 1,4-dioxane (3 μg/L), it was not known whether the concentrations of 1,4-dioxane at certain locations exceeded the treatment objective. Quantitation of 1,4-dioxane concentration was possible for only one well, in the vicinity of the proposed extraction well (W-20). For the

samples collected in late June, a Delivery of Analytical Services (DAS) specification for 1,4-dioxane was used which included a requirement for lower reporting limits and was based on a different method (extraction with large volume injection and selective ion monitoring, rather than a heated purge) to attain the lower limits.

The late June 2004 round also used a different method for arsenic analysis in order to confirm that elevated concentrations of arsenic detected in certain samples (GZ-11 and ME-4a) were not attributable to interference from elevated salt (sodium, most likely chloride) concentrations observed in these samples. A DAS specification was prepared for analysis of arsenic by hydride generation. This method removes the arsenic from the matrix as a hydride which is then analyzed.

The 2004 analytical data indicated several trends in the residual groundwater contamination at the Site, including three distinct residual source areas (M&E, 2005a). The first area is centered on the State-owned portion of the Site in the vicinity of monitoring well GZ-11 (Area A). The residual plume from this area travels easterly toward Route 125. Concentrations of total VOCs in GZ-11A, recorded during the March 2004 and June 2004 Groundwater Monitoring Events, were in the range of 6,500 to 9,100 ug/L and contained BTEX (benzene, toluene, ethylbenzene, and xylene) and chlorinated solvent compounds at concentrations exceeding Federal maximum contaminant levels (MCLs).

The second residual source area is in the southeast corner of the State-owned portion of the Site, along the fence that borders Route 125, in the vicinity of monitoring wells ME-4 and MEOW-3 (Area B). Soil boring data from more recent monitoring well installations (ME-series, MEEW-series, and MEOW-series) indicated that aquifer soils (~5 feet below ground surface (bgs) to bedrock) in the area between ME-4, MEOW-4, and South Brook, are fine in texture and less permeable. Contaminants were likely retained in the finer soils in this area and have been slowly migrating to the east beneath Route 125 or discharging to South Brook just before it flows under Route 125. During the March 2004 and June 2004 groundwater monitoring events, total VOCs in wells ME-4 and MEOW-3 ranged from 900 to 8,400 ug/L.

The third residual source area, located north of the State-owned portion of the Site on the BBS Realty Trust parcel (Area C), is less distinct because of the lack of monitoring wells and/or available data in the area as of 2004. A plume of lower total VOC concentrations (18 to 60 ug/L) lies roughly parallel to North Brook. The compounds detected included BTEX, chlorinated solvents, and 1,4-dioxane. Trichloroethene (TCE), tetrachloroethene (PCE), and/or vinyl chloride exceeded Federal MCLs in samples from wells B-5A, GZ-09, and B-4A, with the highest concentration being that for TCE at B-5A (20 µg/L, as compared to an MCL of 5 µg/L). The 1,4-dioxane concentrations in samples from these wells ranged from 9.6 µg/L at B-5A to 40 µg/L at B-4A.

The total VOC data from the 2004 groundwater monitoring events is shown in Figure 5.

6.3.3 2005 Groundwater Monitoring Round

The December 2005 groundwater sampling was conducted by M&E from December 19 through 22; groundwater elevations were measured on December 15, 2005 (M&E, 2006). Groundwater samples were collected from 27 wells and analyzed for VOCs and/or 1,4-dioxane. The purpose of the December 2005 round was to evaluate whether changes in the plume had occurred since 2004, due to natural attenuation, seasonal variation, or a combination of these factors. The total VOC plume map created from the December 2005 results is presented in Figure 6, and the 1,4-dioxane plume map is presented in Figure 7.

6.3.4 Residential Well Data Review

Residential wells near the Site were most recently sampled by NHDES in August 2008, and the results were summarized in a September 17, 2003 memo. NHDES sampled 13 wells at 8 locations for sulfate (method Lachat 10-511-00-1-A) and volatile organic compounds (VOCs) (EPA Method 524.2). The VOC Methyl-tert-butyl ether (MTBE), which is not a site-related contaminant, was detected at two locations at very low levels (0.5 to 2.3 ppb). No other VOCs were detected in the September 2008 residential well water samples. Samples were also collected for sulfate analysis in 2008 to establish a base-line level in order to monitor for any impacts associated with implementation of the full-scale ISCO technology (sulfate is a byproduct of the specific chemical oxidation process). Sulfate concentrations ranged from 5.7 to 31 mg/L compared to an Ambient Groundwater Quality Standard of 500 mg/L.

6.4 SITE INSPECTIONS

There has been a significant amount of activity at the site this year including field investigations and the first full scale round of oxidant injections in the Summer of 2008. Demobilization for the first round of oxidant injection took place in September 2008. The site was thoroughly inspected by EPA in September 2008. There have been routine visits to the site in October, November and December 2008 to perform groundwater and surface water monitoring. A limited site inspection was performed on September 16, 2008 by EPA, NHDES, and M&E to verify the completion of the first round of oxidant injection, security of the Site and the condition of the injection and monitoring wells (see Attachment 4). De-mobilization activities for the first round of oxidant injection were nearly complete, all the monitoring and injection wells have been secured and the fencing around the site is in good condition. No security or maintenance issues have been identified on the GLCC/KSD and O&G portions of the site.

Inspections performed by the Army Corps of Engineers in 2008 on the restored Country Pond Marsh portion of the site identified several concerns that could affect the long term outcome of the restoration effort. These are: subsidence of hummocks, poor survival of planted trees and shrubs, and colonization of the wetland by *Phragmites*. As discussed in Section 4.3 of this Report, the restored Country Pond Marsh wetland area requires continued monitoring and maintenance until the restoration is complete.

6.5 INTERVIEWS

Since the planning for and implementation of the OU3 *in-situ* chemical oxidation remedy required significant site discussions with the community over the past year (see Section 6.1 of this Report), formal site interviews were not considered to be a necessary part of this five-year review.

SECTION 7.0
TECHNICAL ASSESSMENT

This section discusses the technical assessment of the remedy for the site and provides answers to the three questions posed in the EPA guidance for five-year reviews (USEPA, 2001).

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

Yes. The OU1 source control remedy (O&G soil cleanup) resulted in the removal and treatment of soil to the ROD cleanup level of 1 mg/kg total VOCs that was established to protect groundwater. Groundwater contaminant concentrations in the O&G portion of the site are steadily declining, indicating that the OU1 remedy is functioning as intended. Cleanup levels for contaminants other than VOCs were not established for OU1, with the underlying assumption that treatment to the target level for total VOCs would also result in non-hazardous levels of other contaminants.

The OU1 O&G soil was excavated only to the relatively shallow groundwater table in this area of the site (less than 10 feet below ground surface). The VOC contaminated soils which may be present below the groundwater table may not allow for unlimited and unrestricted use of this portion of the site. The actions necessary to address the VOC contaminated soils which may be present below the water table in this area of the site needs to be addressed in a future EPA decision document.

OU2 (PRP lead groundwater remediation) was terminated and replaced by OU3 (Superfund lead groundwater remediation). The components of the ongoing OU3 groundwater remediation include: *in-situ* chemical oxidation (ISCO); environmental monitoring (including a residential groundwater monitoring program) and institutional controls.

The OU3 remediation is being implemented in accordance with the September 2007 amended ROD and is expected to function as intended after all chemical injections are fully implemented. The first round of oxidant injection was performed in the Summer 2008. Two more rounds of oxidant injection are currently planned (Summer 2009 and Summer 2010). Environmental monitoring (groundwater, surface water and sediment) is being performed to evaluate the performance of the groundwater remediation and to verify that there are no adverse impacts to nearby surface waters including Country Pond. Monitoring of select residential groundwater wells has been performed by the NHDES since 1992 and continues on an annual basis. Monitoring will continue until the groundwater cleanup goals established have been achieved throughout the site.

However, the institutional controls required by the amended OU3 ROD still need to be implemented, on properties where they have not yet been established, in the form of the establishment of deed restrictions and/or notices to establish a groundwater restriction area which would also be integrated into a State Groundwater Management Zone (GMZ) and a land-use restriction to prevent digging into contaminated substrates or disturbance of remedial components (including monitoring and injection wells) on the state owned property (GLCC/KSD portion of the site) and on areas of abutting properties. The institutional controls will also need to

include a requirement to evaluate the potential risks via the vapor intrusion pathway prior to construction of any structures being contemplated within the groundwater restriction area.

The OU4 source control remedy removed most of the soil and sediments that exceeded applicable cleanup levels, in the GLCC/KSD portion of the site, the South Brook area, a small portion of the BBS Realty portion of the site, and the Country Pond Marsh portion of the site. Soil cleanup levels were not established in the ROD for contaminants other than PCBs and total VOCs, with the underlying assumption that treatment to the target level for total VOCs would also result in nonhazardous levels of other contaminants. During remediation of the OU4 portion of the site, some soil exceeding PCB and/or VOC cleanup levels on the GLCC/KSD portion of the site could not be excavated due to the proximity of the Route 125 embankment. Additionally, on a small area of the BBS Realty portion of the site, just beyond the perimeter of the GLCC/KSD portion, residual PCB soil contamination remains at depths greater than 8 feet below ground surface was left in place. However, it was determined that the presence of this soil does not pose a threat to human health or the environment under current usage, because the soil is not accessible. Therefore, the OU4 remedy is still considered effective under current conditions except in the small area on the BBS Realty portion of the site where PCBs exceed the residential cleanup standard currently established for PCBs at the site.

In July 2007 the State of New Hampshire recorded a notice to the chain of title for the GLCC/KSD property to document the land activity and use restrictions (AURs) required to maintain the protectiveness of the soil remedy and to establish institutional controls over the 5.89 acres of the property. The AURs allow for commercial or industrial uses provided soils are not disturbed at a depth greater than six feet. Use of the property as a residence, school, nursery, recreational area or any other use at which a child's presence is likely or intended is not permitted. Installation of groundwater wells or any removal or exposure to groundwater (except for remediation purposes) is not permitted unless such activity is first evaluated and approved by the EPA and NHDES. Fencing has been installed and currently the property is unused.

Finally, as briefly discussed above, residual soil contamination remains on a small portion (4,000 ft^2) of the 29-acre BBS Realty portion of the site. PCBs remain in the soil in this relatively small area above the current 3 ppm residential cleanup goal at depths ranging from 8 to 12 feet below ground surface. The residual PCB concentrations range from 5.28 ppm to 15.1 ppm with an average concentration of 7.76 ppm. The protectiveness of the current 3 ppm residential cleanup level for PCBs at this site also needs to be re-evaluated. The actions necessary to address the residual PCB soil contamination on this small portion of the site and the re-evaluation of the 3 ppm cleanup goal needs to be addressed in a future EPA decision document.

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

No. The fish ingestion risk of PCBs in Country Pond calculated in the 1994 human health risk assessment for fish ingestion (ADL, 1994) was recalculated using the most recent recommended ingestion rates from the "Child-Specific Exposure Factors Handbook" (EPA, 2008), and the most recent cancer oral slope factor and reference dose for PCBs from EPA's Integrated Risk

Information System (IRIS). Although neither of these values has changed since the last five-year review, the fish ingestion risk was not re-calculated as part of the last five-year review. The re-calculation indicates that the non-cancer risk of PCBs due to recreational fish ingestion (from Country Pond) has a hazard quotient (HQ) of approximately 3. However, it should be noted that the fish tissue data used in the updated risk calculations was collected prior to the OU4 soil and sediment remediation and is considered to be outdated information.

The five-year review conducted for the site in 2003 provided a thorough re-evaluation of the other exposure assumptions, toxicity data, and cleanup levels using EPA risk assessment guidance current at that time. The 2003 five-year review updated the human health exposure assumptions to the sediment in Country Pond Marsh to include recreational exposure. Previous risk assessments evaluated only the ecological risks posed by these sediments. The 2003 five-year review found that the ecologically derived PCB cleanup goal of 10 ppm was also protective of recreational human exposures. The exposure assumptions for soil and groundwater assumed in the 1987 ROD and the amended 2007 ROD are still valid.

The cleanup levels for soil, sediment and groundwater (as amended in the 2007 ROD Amendment) are also still valid. As discussed in the previous review, the cleanup level of 20 ppm for PCBs in soil on the former GLCC/KSD property which is based on future commercial use without day care is still valid. Institutional controls are now in place to enforce the non-residential use of the GLCC/KSD property. The residential cleanup level of 3 ppm for PCBs in soils for areas outside of the GLCC/KSD property is also still valid. However, as discussed in Section 7.1, the protectiveness of the 3 ppm residential cleanup level for PCBs at this site will be re-visited in a future EPA decision document. As discussed above the cleanup level of 10 ppm for PCBs in Country Pond Marsh sediment is protective of recreational human exposure and the last review concluded that the 10 ppm level is still protective of ecological receptors.

A cleanup level for total VOCs in soil and sediment was set at 1 ppm as a level protective of future impacts to groundwater and the specific limits for individual VOCs in soil (TCE 0.384 ppm; PCE 0.12 ppm; and benzene 0.11 ppm) are below risk-based levels for a commercial scenario, based on a 1×10^{-5} carcinogenic risk. Therefore, the VOC cleanup level for soils and sediments are still considered to be valid.

Toxicity values (reference doses and cancer slope factors) for the contaminants of concern have not changed since the previous five-year review.

As discussed in this five-year review, the 1987 ROD was amended in September 2007 to change the OU3 groundwater cleanup approach from traditional pump and treat technology to *in-situ* chemical oxidation. The 2007 ROD amendment updated the remedial action objectives and groundwater cleanup goals for the site (including the addition of 1,4 dioxane as a contaminant of concern). There have been no changes to the remedial action and groundwater cleanup goals since issuing the 2007 ROD amendment.

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

No. There is no other information that calls into question the protectiveness of the remedy.

SECTION 8.0
ISSUES

Based on the activities conducted during this five-year review, the issues identified in Table 2 have been noted.

Table 2: Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
To prevent the future use of site groundwater, institutional controls on properties where they are not yet established, are needed in the form of deed restrictions and/or notices to establish land-use restrictions and a groundwater restriction area which would also be integrated into a State Groundwater Management Zone (GMZ).	N	Y
Two relatively small areas just outside the perimeter of the GLCC/KSD portion of the site required cleanup to the site's 3 ppm residential soil cleanup level for PCBs. This goal was achieved in one of the areas. In the other area some residual PCB contamination greater than 3 ppm remains at a depth of 8 to 12 feet below ground surface (see Figure 7). Furthermore, the protectiveness of the current 3 ppm residential soil cleanup level for PCBs needs to be re-evaluated. Currently there is no residential use at any portion of the site.	N	Y
The soil at the O&G portion of the site was excavated only to the relatively shallow groundwater table (less than 10 feet below ground surface). The VOC contaminated soils which may still be present below the	N	Y

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
groundwater table may not allow for unlimited and unrestricted use of this portion of the site. This portion of the site is not currently being used.		
The fish ingestion risk of PCBs in Country Pond was recalculated using the most recent recommended ingestion rates from the "Child-Specific Exposure Factors Handbook" (EPA, 2008), and the most recent cancer oral slope factor and reference dose from EPA's Integrated Risk Information System (IRIS). Although neither of these values has changed since the last five-year review, the fish ingestion risk was not re-calculated as part of the last five-year review. The re-calculation indicates that the non-cancer risk of PCBs due to recreational fish ingestion (from Country Pond) has a hazard quotient (HQ) of approximately 3. However, it should be noted that the fish tissue data used in the updated risk calculations was collected prior to the OU4 soil and sediment remediation and is considered to be outdated information.	N	Y

SECTION 9.0
RECOMMENDATIONS AND FOLLOW-UP ACTIONS

In response to the issues noted in Section 8.0 it is recommended that the actions listed in Table 3 be taken:

Table 3: Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
To prevent the future use of site groundwater institutional controls, on properties where they are not yet established, are needed in the form of deed restrictions and/or notices to establish land-use restrictions and a groundwater restriction area which would also be integrated into a State Groundwater Management Zone (GMZ).	Obtain the required institutional controls.	EPA, NHDES	NHDES	12/29/11	N	Y
Two relatively small areas just outside the perimeter of the GLCC/KSD portion of the site required cleanup to the site's 3 ppm residential soil cleanup level for PCBs. This goal was achieved in one of the areas. In the other area some residual PCB contamination greater than 3 ppm remains at a depth of 8 to 12 feet below ground surface (see Figure 7). Furthermore, the protectiveness of the current 3 ppm residential	The actions necessary to address the small amount of PCB contaminated soil that exceeds the site's 3 ppm residential cleanup goal and the protectiveness of the current 3 ppm residential cleanup level for PCBs will	EPA, NHDES	EPA	12/29/11	N	Y

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
soil cleanup level for PCBs needs to be re-evaluated. Currently there is no residential use at any portion of the site.	be addressed in a future EPA decision document. .					
The approximately 1-acre OU1 soil remediation at the O&G portion of the site (see Figure 2) was excavated only to the relatively shallow groundwater table (less than 10 feet below ground surface). The VOC contaminated soils which may still be present below the groundwater table may not allow for unlimited and unrestricted use of this small area on the O&G portion of the site. The O&G portion of the site is not currently being used.	The actions necessary to address the VOC contaminated soils which may be present below the water table in the approx. 1-acre area on the O&G portion of the site needs to be addressed in a future EPA decision document.	EPA, NHDES	EPA	12/29/11	N	Y
The fish ingestion risk was recalculated using the most recent recommended ingestion rates from the "Child-Specific Exposure Factors Handbook" (EPA, 2008), and the most recent cancer oral slope factor and reference dose from EPA's Integrated Risk Information System (IRIS). Although neither of these values has changed since the last five-year review, the fish ingestion risk was not re-calculated as part of the last five-year review. The	Additional surface water, sediment and fish tissue sampling at the outlet of Country Pond Marsh and in Country Pond should be performed.	EPA, NHDES	EPA	12/29/10	N	Y

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
re-calculation indicates that the non-cancer risk of PCBs due to recreational fish ingestion (from Country Pond) has a hazard quotient (HQ) of approximately 3. However, it should be noted that the fish tissue data used in the updated risk calculations was collected prior to the OU4 soil and sediment remediation and is considered to be outdated information.						

SECTION 10.0
PROTECTIVENESS STATEMENTS

OU1

The remedial action taken at OU1 (O&G soil) currently protects human health and the environment because the remediation of soil has been completed to cleanup levels that are protective of human health and the environment. The O&G portion of the site is not currently being used. However, in order for the remedy to be protective in the long-term the following action needs to be taken to ensure protectiveness. The approximately 1-acre OU1 soil remediation at the O&G portion of the site (see Figure 2) was excavated only to the relatively shallow groundwater table (less than 10 feet below ground surface). The VOC contaminated soils which may still be present below the groundwater table may not allow for unlimited and unrestricted use of this small area on the O&G portion of the site. The actions necessary to address the VOC contaminated soils which may be present below the water table in the approx. 1-acre area on the O&G portion of the site needs to be addressed in a future EPA decision document.

OU2

There is no need for a protectiveness statement for OU2 because OU2 (PRP lead groundwater remediation) was terminated and replaced by OU3 (Superfund lead groundwater remediation).

OU3

The remedy at OU3 (*in-situ* chemical oxidation in Areas A, B and C) currently protects human health and the environment because exposure pathways that could result in unacceptable risks are being controlled since: the site's groundwater is not currently being used; and select residential wells in close proximity to the site are routinely monitored by the NHDES to ensure that they are not affected by site related contaminants. However, in order for the remedy to be protective in the long-term the following actions need to be taken to ensure protectiveness: 1) to prevent the future use of site groundwater until groundwater cleanup goals have been reached, institutional controls will be implemented on parcels underlain by contaminated groundwater where institutional controls have not been established in the form of deed restrictions and/or notices to establish a groundwater restriction area which would also be integrated into a State Groundwater Management Zone (GMZ); and 2) a land-use restriction to prevent digging into contaminated substrates or disturbance of remedial components (including monitoring and injection wells) on the state-owned portion of the site (GLCC/KSD) and on areas of abutting properties. Institutional controls will also include a requirement to evaluate the potential risks via the vapor intrusion pathway prior to construction of any structures within this groundwater restriction area. The groundwater restriction area will include areas to the east of Route 125 and properties north and south of the State-owned portion of the site (GLCC/KSD) – where restrictions have already been established.

OU4

The remedy at OU4 (soil and sediment excavation) currently protects human health and the environment because: soil and sediments have been excavated to cleanup levels that are considered protective for the anticipated future use of the property; the GLCC/KSD portion of the site is currently unused and the property is surrounded by a fence; institutional controls are in place to limit the uses and exposures to residual soil contamination on the GLCC/KSD portion of the site; and the wetlands (Country Pond Marsh portion of the site) is also surrounded on three sides with a fence. However, the remedial action at OU4 may not protective in the long-term because in a limited area (see Figure 7) there are PCB contaminated soils 8 to 12 feet below ground surface that exceed the site's 3 ppm residential cleanup goal. Furthermore, the protectiveness of the current 3 ppm residential soil cleanup level for PCBs needs to be re-evaluated. Currently there is no residential use at any portion of the site. The actions necessary to address the small amount of PCB contaminated soil that exceeds the site's 3 ppm residential cleanup goal and the protectiveness of the current 3 ppm residential cleanup level for PCBs will be addressed in a future EPA decision document.

In addition, the fish ingestion risk of PCBs in Country Pond was recalculated using the most recent recommended ingestion rates from the "Child-Specific Exposure Factors Handbook" (EPA, 2008), and the most recent cancer oral slope factor and reference dose from EPA's Integrated Risk Information System (IRIS). Although neither of these values has changed since the last five-year review, the fish ingestion risk was not re-calculated as part of the last five-year review. The re-calculation indicates that the non-cancer risk of PCBs due to recreational fish ingestion (from Country Pond) has a hazard quotient (HQ) of approximately 3. However, it should be noted that the fish tissue data used in the updated risk calculations was collected prior to the OU4 soil and sediment remediation and is considered to be outdated information.

Site-Wide Protectiveness Statement

The remedial actions at all operable units are currently protective of human health and the environment. However, because the remedial actions at OU1, OU3 and OU4 have not yet achieved protectiveness in the long-term, the site is not protective of human health and the environment in the long-term until several follow-up actions are undertaken.

The remedial action at OU1 is not protective in the long-term because the approximately 1-acre OU1 soil remediation at the O&G portion of the site (see Figure 2) was excavated only to the relatively shallow groundwater table (less than 10 feet below ground surface). The VOC contaminated soils which may still be present below the groundwater table may not allow for unlimited and unrestricted use of this small area on the O&G portion of the site. The actions necessary to address the VOC contaminated soils which may be present below the water table in the approx. 1-acre area on the O&G portion of the site needs to be addressed in a future EPA decision document.

The remedial action at OU3 is not protective in the long-term because the institutional controls needed to prevent the future use of site groundwater until groundwater cleanup goals have been reached are not currently in place. Institutional controls will be implemented in the form of deed restrictions and/or notices to establish a groundwater restriction area which would also be integrated into a State Groundwater Management Zone (GMZ) and a land-use restriction to prevent digging into contaminated substrates or disturbance of remedial components (including monitoring and injection wells) on the site and on areas of abutting properties. Institutional controls will also include a requirement to evaluate the potential risks via the vapor intrusion pathway prior to construction of any structures within this groundwater restriction area. The groundwater restriction area will include areas to the east of Route 125 and to the properties adjacent to the State-owned property (GLCC/KSD) to the north and south.

The remedial action at OU4 may not protective in the long-term because in a limited area (see Figure 7) there are PCB contaminated soils 8 to 12 feet below ground surface that exceed the site's 3 ppm residential cleanup goal. Furthermore, the protectiveness of the current 3 ppm residential soil cleanup level for PCBs needs to be re-evaluated. Currently there is no residential use at any portion of the site. The actions necessary to address the small amount of PCB contaminated soil that exceeds the site's 3 ppm residential cleanup goal and the protectiveness of the current 3 ppm residential cleanup level for PCBs will be addressed in a future EPA decision document.

In addition, the fish ingestion risk of PCBs in Country Pond was recalculated using the most recent recommended ingestion rates from the "Child-Specific Exposure Factors Handbook" (EPA, 2008), and the most recent cancer oral slope factor and reference dose from EPA's Integrated Risk Information System (IRIS). Although neither of these values has changed since the last five-year review, the fish ingestion risk was not re-calculated as part of the last five-year review. The re-calculation indicates that the non-cancer risk of PCBs due to recreational fish ingestion (from Country Pond) has a hazard quotient (HQ) of approximately 3. However, it should be noted that the fish tissue data used in the updated risk calculations was collected prior to the OU4 soil and sediment remediation and is considered to be outdated information.

SECTION 11.0
NEXT FIVE-YEAR REVIEW

The next Five-Year Review for the Ottati & Goss/Kingston Steel Drum Superfund Site is due in February 2014, five years from the signature date of this review.

ATTACHMENT 1

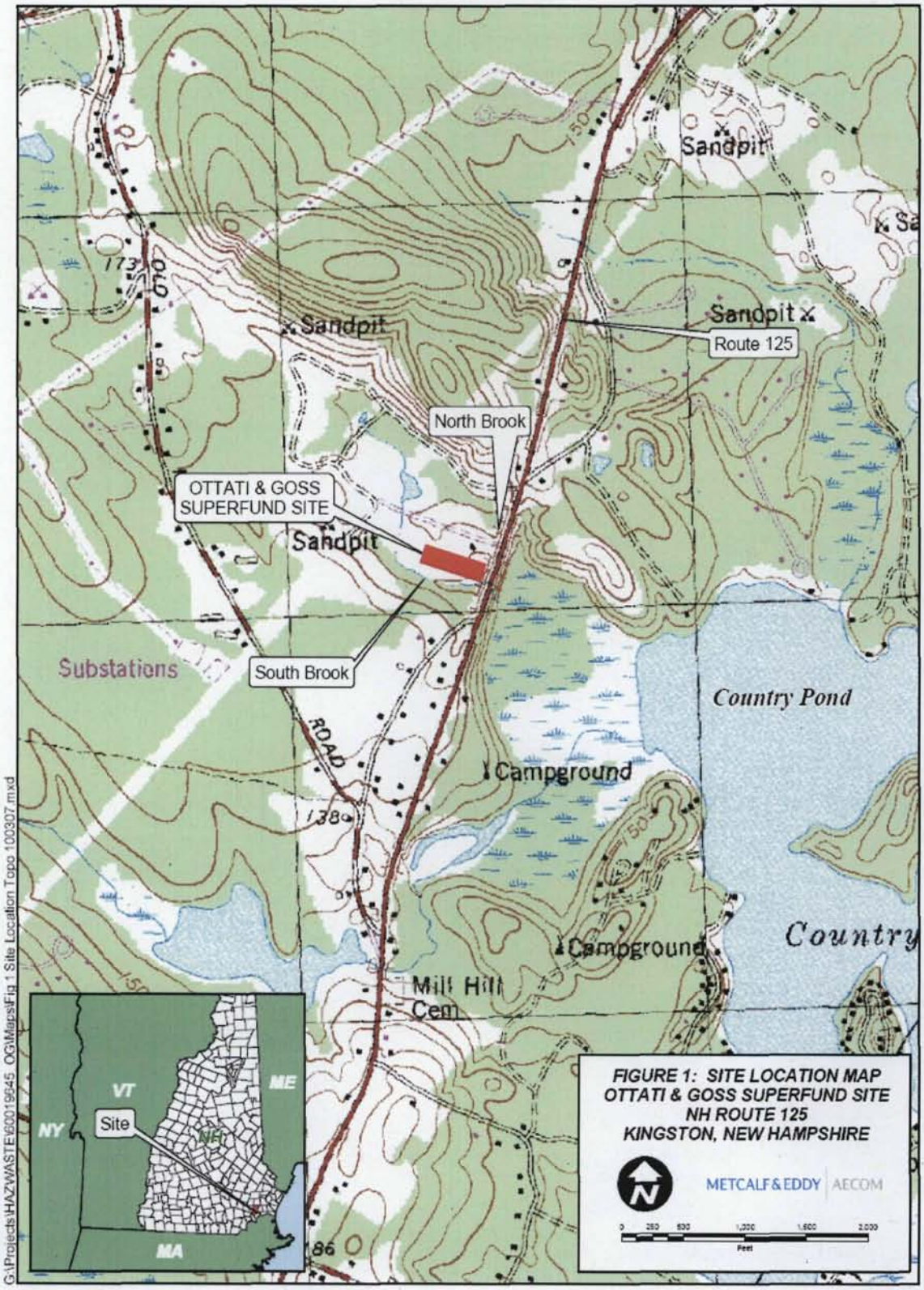
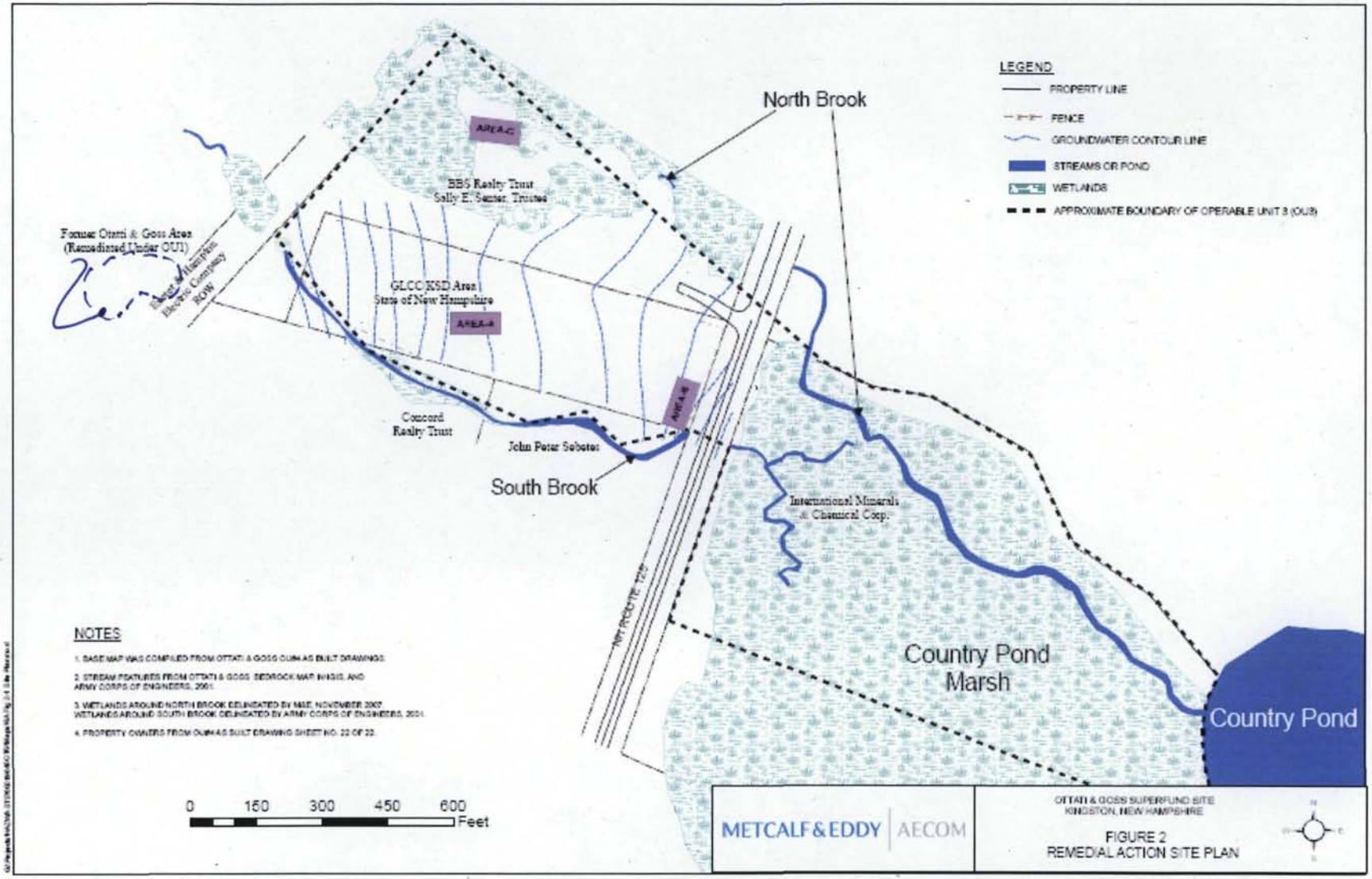
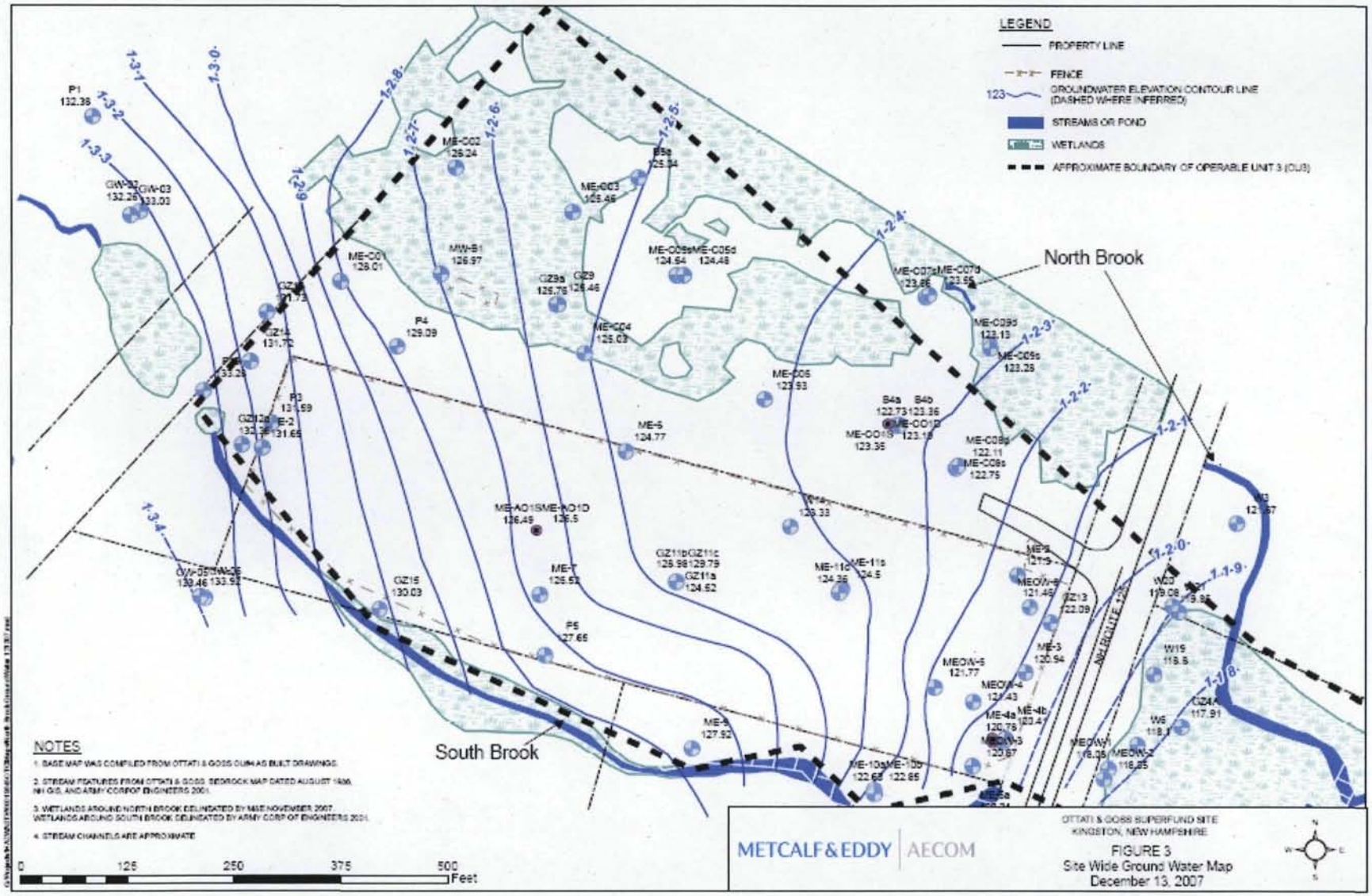
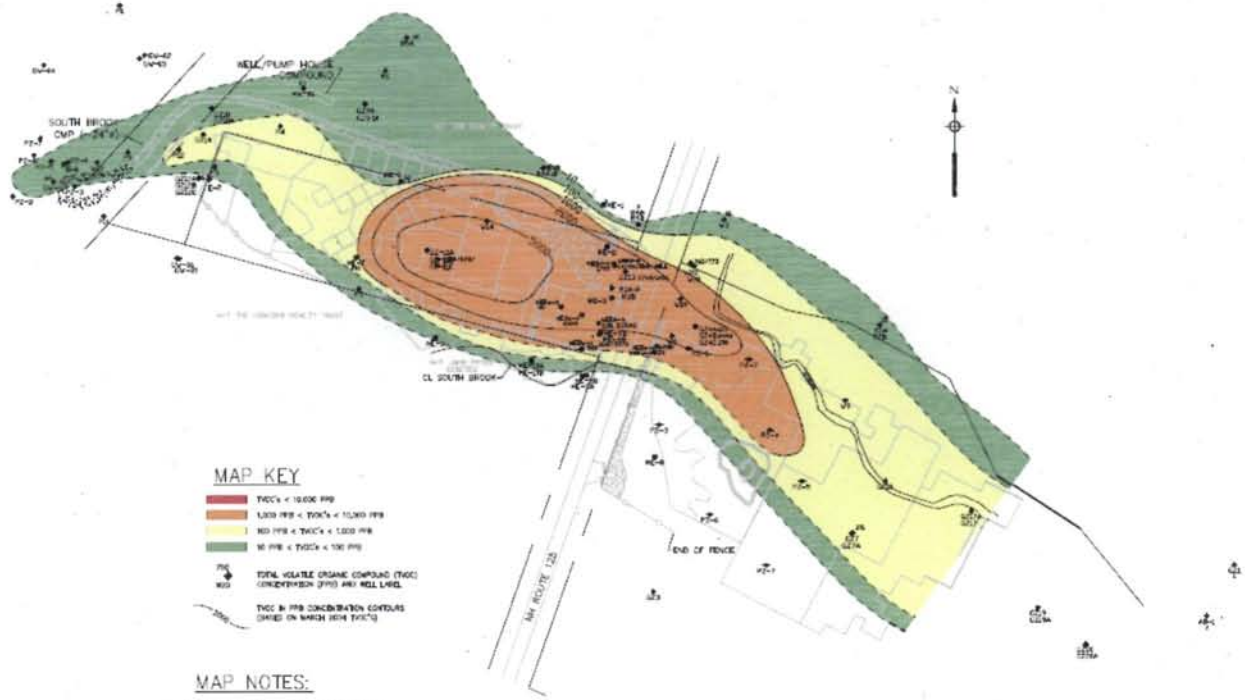


FIGURE 1: SITE LOCATION MAP
OTTATI & GOSS SUPERFUND SITE
NH ROUTE 125
KINGSTON, NEW HAMPSHIRE


LEGEND
PROPERTY LINE
FENCE
GROUNDWATER CONTOUR LINE
STREAMS OR POND
WETLANDS
APPROXIMATE BOUNDARY OF OPERABLE UNIT 3 (OU3)
North Brook
South Brook
AREA-C
AREA-B
AREA-A
BBS Realty Trust
Sally E. Senter, Trustee
Former Ottati & Goss Area
(Remediated Under OU1)
Public Service of New Hampshire
Electric Company
ROW
GLCC KSD Area
State of New Hampshire
Concord
Realty Trust
John Peter Sebeter
International Minerals
& Chemical Corp.
NH ROUTE 125
Country Pond
Marsh
Country Pond
NOTES
1. BASE MAP WAS COMPILED FROM OTTATI & GOSS OUM AS BUILT DRAWINGS.
2. STREAM FEATURES FROM OTTATI & GOSS, BEDROCK MAP NHGIS, AND ARMY CORPS OF ENGINEERS, 2001.
3. WETLANDS AROUND NORTH BROOK DELINEATED BY M&E, NOVEMBER 2007. WETLANDS AROUND SOUTH BROOK DELINEATED BY ARMY CORPS OF ENGINEERS, 2001.
4. PROPERTY OWNERS FROM OUM AS BUILT DRAWING SHEET NO. 22 OF 22.
0 150 300 450 600 Feet
METCALF & EDDY | AECOM
OTTATI & GOSS SUPERFUND SITE
KINGSTON, NEW HAMPSHIRE
FIGURE 2
REMEDIAL ACTION SITE PLAN


LEGEND
PROPERTY LINE
FENCE
123 GROUNDWATER ELEVATION CONTOUR LINE (DASHED WHERE INFERRED)
STREAMS OR POND
WETLANDS
APPROXIMATE BOUNDARY OF OPERABLE UNIT 3 (OU3)
North Brook
South Brook
NOTES
1. BASE MAP WAS COMPILED FROM OTTATI & GOSS OUM AS BUILT DRAWINGS.
2. STREAM FEATURES FROM OTTATI & GOSS. BEDROCK MAP DATED AUGUST 1986, NH GIS, AND ARMY CORPOF ENGINEERS 2001.
3. WETLANDS AROUND NORTH BROOK DELINEATED BY M&E NOVEMBER 2007. WETLANDS AROUND SOUTH BROOK DELINEATED BY ARMY CORP OF ENGINEERS 2001.
4. STREAM CHANNELS ARE APPROXIMATE
0 125 250 375 500 Feet
METCALF & EDDY | AECOM
OTTATI & GOSS SUPERFUND SITE
KINGSTON, NEW HAMPSHIRE
FIGURE 3
Site Wide Ground Water Map
December 13, 2007



MAP KEY

- TVOCs < 10,000 PPB
- 1,000 PPB < TVOCs < 10,000 PPB
- 100 PPB < TVOCs < 1,000 PPB
- 10 PPB < TVOCs < 100 PPB
- TOTAL VOLATILE ORGANIC COMPOUND (TVOC) CONCENTRATION (PPB) AND WELL LABEL
- TVOC IN PPB CONCENTRATION CONTOURS (BASED ON MARCH 2004 TVOC'S)

MAP NOTES:

1. MONITORING WELLS [illegible] WERE SAMPLED DURING BOTH MARCH AND JUNE 2004. TVOC'S ARE REPORTED AS MARCH/JUNE. CONTOURS ARE DRAWN BASED ON MARCH DATA.
2. MW04-SERIES WELLS SAMPLED IN JUNE ONLY. MW04-1, MW04-2, MW04-3, MW04-4, MW04-5, MW04-6.
3. BEDROCK WELLS: [illegible] ARE CONSIDERED WELLS. ALL OTHERS.

SOURCE: AS-BUILT DRAWINGS (DEC, MARCH 2003)

LEGEND

WELL NO.	EXISTING MONITORING WELL LOCATION & ID
WELL NO.	RECOVERY LOCATION & ID
WELL NO.	NAE WELL LOCATION & ID
———	PROPERTY LINE

NUMBER	DATE	MADE BY	CHECKED	DESCRIPTION
1	12/1/05	MB	DAC	CHANGED FIGURE NUMBER. ADDED JUNE 2004 DATA

REVISIONS

Metcalf & Eddy

REG. PROF. ENGR. — DATE

REG. PROF. ENGR. — DATE

DRAWN BY: M. BALETSA

DEPT. MGR.: M. ABRAHAMS-DEWATTE

PROJ. MGR.: W. DIESL

SCALE: 1" = 120' (0, 120, 240, 360 FEET)

OTTATI AND GOSS
KINGSTON STEEL DRUM SUPERFUND SITE
KINGSTON, NEW HAMPSHIRE

FIGURE 4 TVOC's MARCH/JUNE 2004
(POST SOURCE REMOVAL)

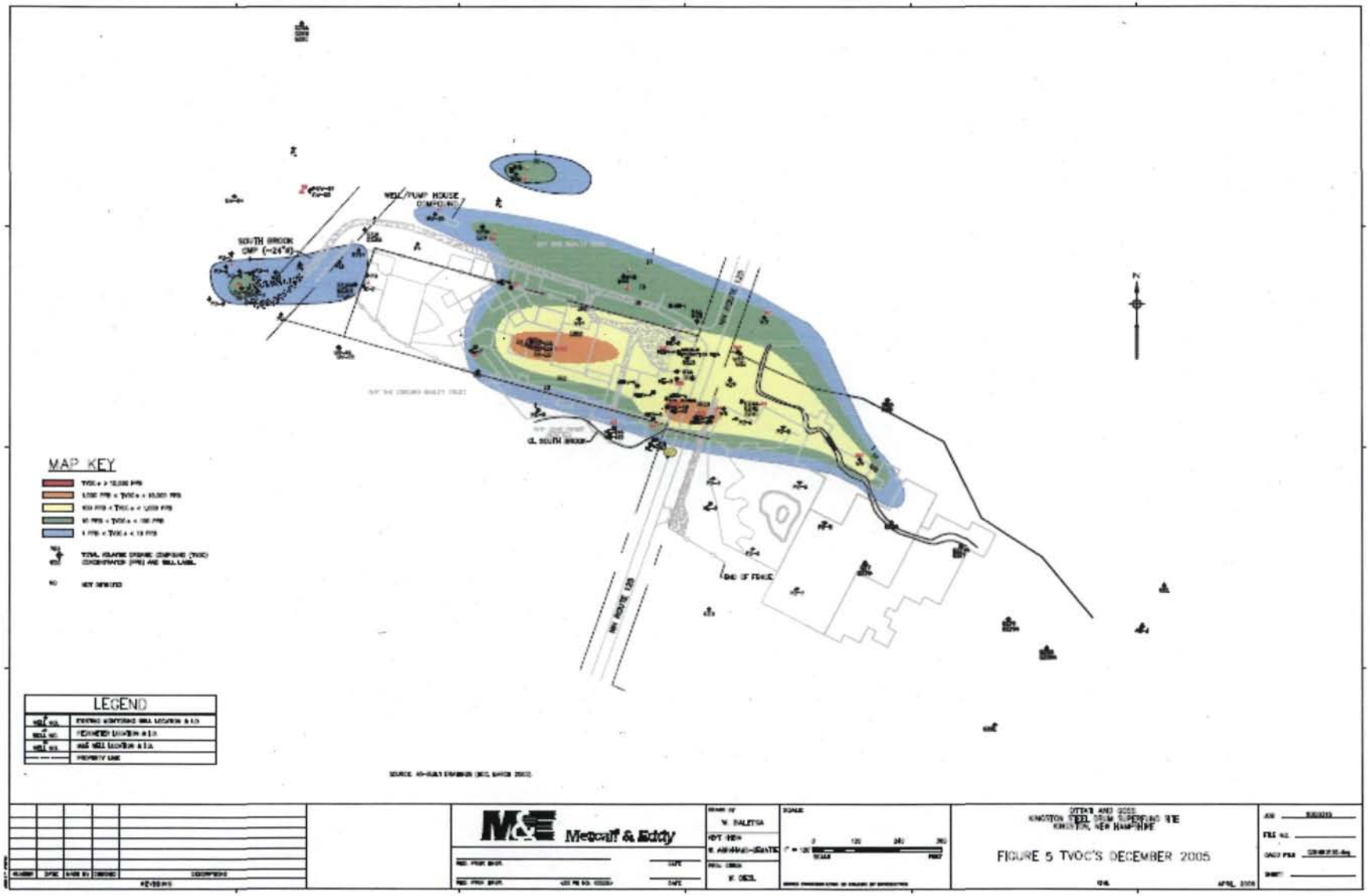
DWL JANUARY 14, 2005

JOB: <CONTRACT NO.>

FILE NO.:

CADD FILE: [illegible]

SHEET: C-6



Metcalf & Eddy

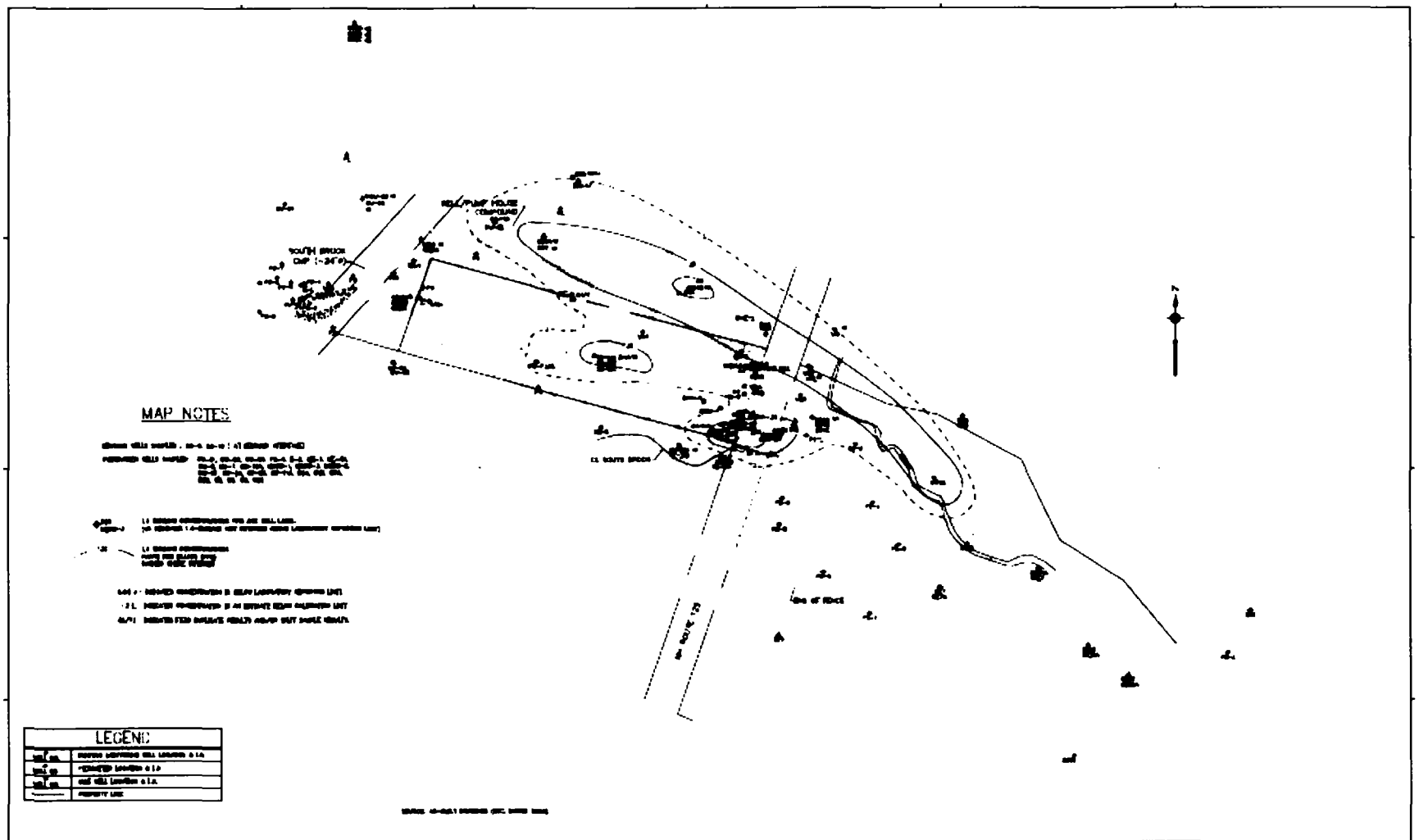
W. DALETSA

W. GRIGG

OTTA'S AND GOSS
KINGSTON STEEL DRUM SUPERFUND SITE
KINGSTON, NEW HAMPSHIRE

FIGURE 5 TVOC'S DECEMBER 2005

APRIL, 2006



Metcalf & Eddy

FIGURE 6 1,4-DIOXANE
DECEMBER 2005

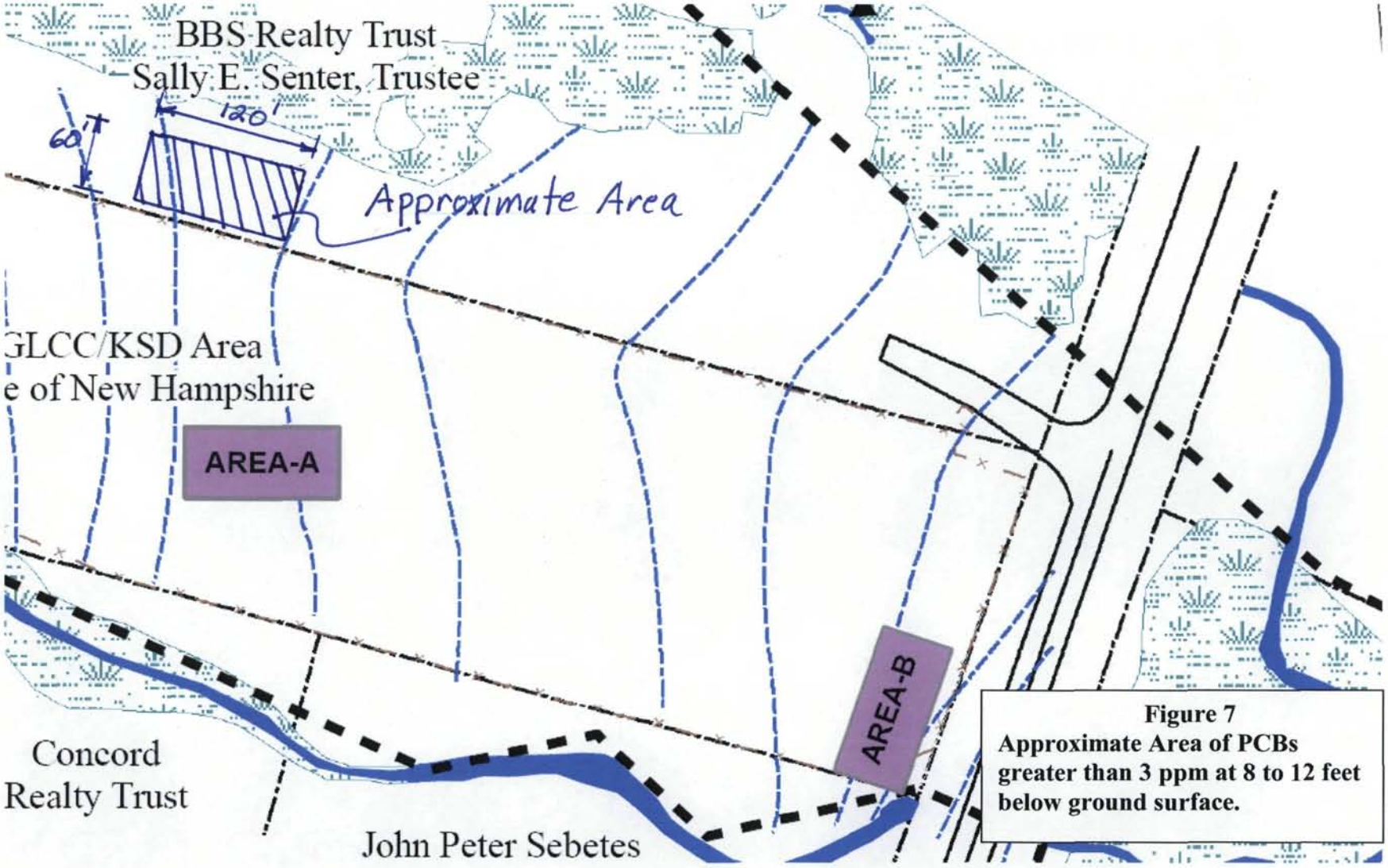


Figure 7
Approximate Area of PCBs greater than 3 ppm at 8 to 12 feet below ground surface.

ATTACHMENT 2

ATTACHMENT 2
LIST OF DOCUMENTS REVIEWED

Arthur D. Little (ADL). 1994. *Ecological Risk Assessment at the Ottati & Goss Site, Kingston, NH.* May, 1994.

Arthur D. Little (ADL). 1994. *GLCC Building Demolition Remedial Action, Ottati & Goss Site, Kingston, NH.* March 18, 1994.

Canonie Environmental Services Corporation (Canonie). 1989. *Report: Soil Remediation and Site Closure - Ottati & Goss Superfund Site, Kingston, New Hampshire.* Prepared for Settling Parties, Ottati & Goss Superfund Site, Kingston, New Hampshire. September 21, 1989.

Environmental Chemical Corporation (ECC). 2003. *Final Remedial Action Report, Ottati & Goss/Kingston Steel Drum Superfund Site, Soil and Sediment Remediation, Operable Unit No. 4.* Prepared for U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, and New Hampshire Department of Environmental Services. March 2003.

GeoTrans Inc. 1986. *Analysis of Groundwater Flow and Chemical Transport from the Ottati and Goss/Great Lakes Container Corporation Sites, vol. 1,* for the U.S. EPA.

Goldberg-Zoino Associates (GZA). 1986. *Remedial Investigation - O&G/GLCC Site, Kingston, NH.* Prepared for the New Hampshire Water Supply and Pollution Control Commission, Concord, NH.

Metcalf & Eddy – AECOM (M&E). 2005a. Groundwater Monitoring Report For The March 2004 And June 2004 Events, Ottati and Goss/Kingston Steel Drum Superfund Site, Operable Unit 3, Kingston, NH. March 2005.

Metcalf & Eddy – AECOM (M&E). 2006. Technical Memorandum For December 2005 Groundwater Monitoring Event, Ottati and Goss/Kingston Steel Drum Superfund Site, Operable Unit 3, Kingston, NH. May 2006.

Metcalf & Eddy – AECOM (M&E). 2008. Basis Of Design Report For In-Situ Chemical Oxidation, Ottati and Goss/Kingston Steel Drum Superfund Site, Operable Unit 3, Kingston, NH. March 2008.

Riordan, P. J., 1984. Groundwater Study - Kingston Steel Drum Site, Kingston, NH.

United States Environmental Protection Agency (USEPA). 1987. Record of Decision, Ottati & Goss/Great Lakes Container Corporation, Kingston, New Hampshire. January 16, 1987.

United States Environmental Protection Agency (USEPA). 1993. Five Year Review, Ottati and Goss/Kingston Steel Drum Superfund Site, Kingston, New Hampshire. December 15, 1993.

United States Environmental Protection Agency (USEPA). 1998. Five Year Review, Ottati and Goss/Great Lakes Container Corporation Superfund Site, Kingston, New Hampshire. December 1998.

United States Environmental Protection Agency (USEPA). 1999. EPA Superfund Explanation of Significant Differences, Ottati and Goss/Kingston Steel Drum Superfund Site. September 28, 1999.

United States Environmental Protection Agency (USEPA). 2001. Comprehensive Five-Year Review Guidance. June 2001.

United States Environmental Protection Agency (USEPA). 2002. EPA Superfund Explanation of Significant Differences, Ottati and Goss/Kingston Steel Drum Superfund Site. February 7, 2002.

United States Environmental Protection Agency (USEPA). 2003. Five Year Review, Ottati and Goss/Great Lakes Container Corporation Superfund Site, Kingston, New Hampshire. December 2003.

United States Environmental Protection Agency (USEPA). 2007. Amended Record of Decision, Ottati & Goss/Great Lakes Container Corporation, Kingston, New Hampshire. September 2007.

United States Environmental Protection Agency (USEPA). 2008a. Preliminary Close Out Report, Ottati & Goss/Great Lakes Container Corporation, Kingston, New Hampshire. September 2008.

United States Environmental Protection Agency (USEPA). 2008b. Child-Specific Exposure Factors Handbook. EPA/600/R-06/096F. September, 2008

ATTACHMENT 3

NH DEPT OF
ENVIRONMENTAL SERVICES
OCT 10 2006
RECEIVED

plan # D 3483 D

037854

2007 JUN 29 AM 11:21

ROCKINGHAM COUNTY
REGISTRY OF DEEDS

NOTICE OF ACTIVITY AND USE RESTRICTION

Site: Ottati & Goss/Great Lakes Container Corp. (a/k/a Kingston Steel Drum) Superfund Site
120 Route 125
Kingston, New Hampshire
Rockingham County Tax Map R13, Lot 14

NHDES Site No.: 199004006

This Notice of Activity and Use Restriction ("Notice") is made on this sixth day of October, 2006 by the State of New Hampshire, together with its successors and assigns (collectively "Owner")

WITNESSETH

WHEREAS, in May 1980, the United States on behalf of the U.S. Environmental Protection Agency ("EPA") brought a lawsuit in the United States District Court for the District of New Hampshire under the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. § 6973, and the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. §§ 9601-9675, and thereby sought the cleanup of the Ottati & Goss/Great Lakes Container Corp. (a/k/a Kingston Steel Drum) site in Kingston, New Hampshire;

WHEREAS, the State of New Hampshire (the "State") intervened in the EPA's lawsuit, raising claims under RCRA, CERCLA, and the State of New Hampshire Hazardous Waste Management Act, NH RSA chapter 147-A;

WHEREAS, a Consent Decree settling the EPA's lawsuit (Civil No. 80-225-L) and a consolidated matter (Civil No. 89-400-D) was approved and entered by the United States District Court for the District of New Hampshire on December 22, 1993 (as modified July 19, 1994);

WHEREAS, the original remedy for the Kingston site, set forth in the January 16, 1987 Record of Decision ("ROD"), required a soil cleanup level within EPA's acceptable risk range for residential uses and therefore did not call for institutional controls;

WHEREAS, a modified remedy, set forth in a September 28, 1999 Explanation of Significant Differences ("ESD"), was based on a change in future land use from residential to commercial, and requires the implementation of institutional controls to restrict the Property, identified on Tax Map R13 as Lot 14, to commercial use;

WHEREAS, by eminent domain proceedings the State ("Property Owner") is the owner in fee simple of part of the Kingston site, a certain parcel of land located at 120 Route 125 in Kingston, New Hampshire with the buildings and improvements thereon, identified on Tax Map R13 as Lot 14, recorded at the Rockingham County, New Hampshire Registry of Deeds at Book

3521, Page 1105, which is more particularly bounded and described in Exhibit A, attached hereto and made a part hereof, and which is depicted in plan B, attached hereto and made a part hereof, (the "Property").

WHERAS, if the State transfers ownership of the Property the State will retain a grant of activity and use restrictions that will run with the land, which will include the activity and use restrictions included in this Notice. The grant will provide the State and EPA access to the Property to implement the CERCLA remedy and will permit the State and EPA, as a third-party beneficiary, the right to enforce the terms of the grant in order to protect any components of the CERCLA remedy on the Property and to protect human health and the environment by reducing the risk of exposure to contaminants.

WHEREAS, the State, acting by and through the Department of Environmental Services ("NHDES"), and the EPA have reviewed and approved this Notice of Activity and Use Restrictions for the Property,

NOW, THEREFORE, notice is hereby given that the Activity and Use Restrictions ("AUR") set forth below apply to the Property:

1. **Permitted Activities and Uses Set Forth in the AUR.** No significant risk from soil exists to human health, safety, or welfare or to the environment, under current conditions and for any foreseeable period of time, so long as the following activities and uses occur on the Property:

   (a) Commercial or industrial uses as permitted by the Town of Kingston Zoning Ordinances or otherwise by the Town of Kingston to include walkways and parking;

   (b) Activities conducted within the Property that do not excavate or disturb subsurface soil below six (6) feet, as long as the final restored grade retains two (2) feet of clean soil over the contaminated soil. Final as built plans showing all modifications to the property's grading will be submitted to NHDES and EPA and a copy recorded in the Rockingham County, New Hampshire Registry of Deeds as an amendment to this Notice of Activity and Use Restriction;

   (c) Groundwater remediation activities, including but not limited to on-site pumping and treating of groundwater, undertaken as a means to comply with the groundwater remediation requirements of the CERCLA remedy; and

   (d) Such other activities and uses, which, in the opinion and concurrence by EPA and NHDES, shall present no greater risk or harm to human health, safety, or welfare or to the environment than the permitted activities and uses set forth herein.

2. **Restricted Activities and Uses Set Forth in the AUR.** Activities and uses that, if implemented at the Property, may result in a significant risk of harm to human health, safety, or welfare or to the environment or present a substantial hazard, are prohibited as follows:

(a) Any activity, including, but not limited to, excavation associated with underground utility or construction work which is likely to disturb PCB (polychlorinated biphenyls) and/or VOC (volatile organic compounds) contaminated soil;

(b) Use of the Property as a residence, school, nursery, recreational areas (such as parks or athletic fields) or any other use at which a child's presence is likely or intended;

(c) Any activity including, but not limited to, relocation of PCB and/or VOC contaminated soil unless such activity is first evaluated and approved by EPA and NHDES; and

(d) Installation of groundwater wells or any removal or exposure to groundwater (except for remediation purposes) unless such activity is first evaluated and approved by EPA and NHDES.

3. **Obligations and Conditions.** Obligations and Conditions to be undertaken and maintained at the Property by the State authority which is managing the Property to maintain a condition of no significant risk as set forth in this Declaration shall include the following:

(a) A Soil Management Plan prepared by a qualified Environmental Consulting Firm and approved by the NHDES and the EPA prior to commencement of any subsurface activity that may involve impact to PCB and/or VOC contaminated soil that would result in direct contact to humans or present a greater risk to the environment.

(b) A site specific Health and Safety Plan prepared by a Certified Hygienist or other qualified health and safety professional, in accordance with 29 CFR 1910.120, prior to commencement of any subsurface activity that may involve impact to PCB and/or VOC contaminated soil. The plan must clearly identify the location of the PCB and/or VOC contaminated soils and specifically identify the types of personal protective equipment, monitoring devices, and engineering controls necessary to ensure that workers and others at the Property are not exposed to PCBs and/or VOCs through dermal contact, ingestion, and/or inhalation of particulate dusts.

(c) The seeded top-soil barrier must be maintained to ensure that PCB and/or VOC contaminated soils beneath the barrier remain inaccessible.

(d) PCB and/or VOC contaminated soil may not be relocated or moved unless first evaluated by an Environmental Consulting Firm, which shall render an opinion that such relocation or movement of the soil is in accordance with the Soil Management Plan (if applicable) and is not inconsistent with maintaining a condition that is protective of human health and the environment, and approved by the NHDES and the EPA.

(e) Prior to commencement of any subsurface activity that may involve extraction or release of contaminated groundwater that could result in direct contact to humans or present a greater risk to the environment. a human health and ecological risk assessment must be conducted by a qualified Environmental Consulting Firm and approved by the NHDES and EPA.

(f) If CERCLA actionable risks are identified, a site specific Groundwater Management Plan must be prepared by a qualified Environmental Consulting Firm and approved by the NHDES and the EPA. In addition, a site specific Health and Safety Plan prepared by a Certified Hygienist or other qualified health and safety professional, in accordance with 29 CFR 1910.120, must be approved by the NHDES and the EPA prior to commencement of any subsurface activity that may involve release or exposure to contaminated groundwater. The plan must clearly identify the types of personal protective equipment, monitoring devices, and engineering controls necessary to ensure that workers and others at the Property are not exposed to contaminated groundwater through dermal contact, ingestion, and/or inhalation.

4. **Emergency Procedures.** In the event of any emergency or condition that may result in significant risk or harm to human health from exposure to site contaminants, the State authority which is managing the Property shall:

(a) Promptly notify NHDES and EPA of such emergency or condition.

(b) Limit disturbance of PCB and VOC contaminated media to the minimum reasonably necessary to adequately respond to such emergency or condition.

(c) Implement appropriate precautions to reduce exposures to PCB and VOC contaminated media by workers at the Property and neighbors to the Property.

(d) Engage the services of an Environmental Consulting Firm to supervise the preparation and implementation of a written plan, for review and approval by NHDES and EPA, for restoring the Property to a condition consistent with the AUR.

(e) Take precautions to limit disturbance of PCB and VOC contaminated media to the minimum necessary to respond to the emergency or condition.

5. **Proposed Changes in Activities and Uses.** The restricted activities and uses set forth above may be amended or modified upon mutual agreement by the NHDES and EPA. Any proposed changes in activities and uses at the Property that may result in a greater risk of exposure to PCBs and VOCs than currently exists at the Property shall be evaluated by the NHDES and EPA as to whether the proposed changes will present an unacceptable level of risk to human health and the environment. Approval by the NHDES and EPA shall be required before such proposed activity or use is commenced.

6. **Duration of Activity and Use Restrictions.** The activity and use restrictions set forth herein shall run with the land, and, pursuant to RSA 147-A:14 and A:14-A (Supp. 2003), and for the benefit of public health, safety, welfare, and environment of the State, the restrictions shall become binding upon successive owners of the Property or portions of the Property and shall remain in effect until the PCB and VOC soil contamination at the Property meets the applicable state and federal standards for any restricted activity or use.

7. **Termination of Activity and Use Restrictions.** The activity and use restrictions set forth herein may be terminated upon mutual agreement by the NHDES and EPA and upon a showing that these restrictions are no longer necessary to maintain the protection of human health and the environment.

8. **Recordation.** This Declaration of Activity and Use Restriction, any modifications or amendments, and any terminations are effective upon recordation of notice in the chain of title for the Property at the Rockingham County, New Hampshire Registry of Deeds. All recordation costs shall be the responsibility of the Property Owner. Owner shall provide certified copies of all AUR recorded instruments to NHDES and EPA within 60 days of recordation.

9. **Incorporation Into Deeds, Mortgages, Leases, and Instruments of Transfer.** This Declaration of Activity and Use Restriction shall be incorporated either in full or by reference into the chain of title of all deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the property or a portion thereof is conveyed. The notice of this instrument shall be substantially in the following form:

NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ACTIVITY AND USE RESTRICTION, DATED _____, 2006, RECORDED IN THE PUBLIC LAND RECORDS DATED _____, 2006, AND RECORDED IN BOOK _____, PAGES _____ OF THE ROCKINGHAM COUNTY LAND RECORDS.

10. **Notices.** Any notice, demand, request, consent, approval, or communication that any party desires or is required to give to the other shall be in writing and shall either be served personally or sent by first class mail, postage prepaid, addressed as follows:

To Property Owner and
To New Hampshire Department of Environmental Services:

Ottati & Goss Superfund Site State Project Coordinator
New Hampshire Department of Environmental Services
P.O. Box 95, 29 Hazen Drive
Concord, New Hampshire 03302-0095
(603) 271-3503

To the United States Environmental Protection Agency:

Ottati & Goss Superfund Site Remedial Project Manager
United States Environmental Protection Agency, Region 1
One Congress Street, Suite 1100, MC HBO
Boston, MA 02114-2023
(617) 918-1335

Property Owner, the State of New Hampshire, hereby authorizes and consents to the filing and recordation of this Notice, which shall become effective upon approval of NHDES and EPA and recordation of this instrument at the Rockingham County New Hampshire Registry of Deeds in the chain of Title for the Property.

WITNESSETH the execution hereof under seal this 26th day of October, 2006.

By: STATE OF NEW HAMPSHIRE
DEPARTMENT OF ENVIRONMENTAL SERVICES

Michael J. Walls
Assistant Commissioner

THE STATE OF NEW HAMPSHIRE
Merrimack, SS.

On the 26 day of October 2006, before me appeared Michael J. Walls known to me (or satisfactorily proven) to be the person whose name appears above, and he/she subscribed his/her name to the foregoing document.

Notary Public/Justice of the Peace
My commission expires:

GAIL C. FRASER, Notary Public
My Commission Expires April 20, 2010

EXHIBIT A

A certain tract or parcel of land situate on the westerly side of Route 125 in the Town of Kingston, County of Rockingham, New Hampshire, being Tax Map R13, Lot 14 owned by Great Lakes Container Corporation:

Beginning at a granite bound along the northwesterly right-of-way limit of New Hampshire Route 125, marking the southeasterly corner of the parcel and the northeasterly corner of land now or formerly of John Peter Sebetes;

Thence N 58° 12' 59" W, along land of said Sebetes, a distance of 458.93 feet to a galvanized iron pipe marking the northeasterly corner of land now or formerly of the Concord Realty Trust;

thence N 58° 00' 49" W, along land of said Concord Realty Trust and crossing a small brook, a distance of 409.34 feet to a point;

thence continuing along land of said Concord Realty Trust N 57° 26' 59" W, a distance of 85.40 feet to the southwesterly corner of the parcel marked by granite bound;

thence turning and running N 35° 57' 01" E, along land now or formerly of BBS Realty Trust, a distance of 267.40 feet to the northwesterly corner of the parcel marked by a galvanized iron pipe;

thence turning and running S 58° 12' 59" E along land of said BBS Realty Trust, a distance of 953.92 feet to a granite bound along the northwesterly right-of-way limit of Route 125, being the northeasterly corner of the parcel;

thence turning and running S 35° 57' 57" W along the northwesterly right-of-way of Route 125, a distance of 270.00 feet to the point of beginning.

containing 5.89 acres or 256,397 square feet, more or less.

Meaning and intending to describe the premises conveyed to the condemnee by deed of International Minerals and Chemicals Corporation dated August 25, 1976, and recorded in the Rockingham County Registry of Deeds at Book 2267, Page 1090 on October 5, 1976.

ATTACHMENT 4

Site Inspection Checklist

I. SITE INFORMATION	
Site name: Ottati and Goss/Kingston Steel Drum	**Date of inspection:**
Location and Region: EPA Region 1, New England	**EPA ID:** NHD990717647
Agency, office, or company leading the five-year review: EPA	**Weather/temperature:** Cloudy, 70s

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other in-situ chemical oxidation injection wells and groundwater monitoring wells.
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** N/A _____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

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

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

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

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

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

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

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

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	**O&M Documents**			
	☐ O&M manual	☐ Readily available	☐ Up to date	☑ N/A
	☐ As-built drawings	☐ Readily available	☐ Up to date	☐ N/A
	☐ Maintenance logs	☐ Readily available	☐ Up to date	☐ N/A
	Remarks			
2.	**Site-Specific Health and Safety Plan**	☑ Readily available	☑ Up to date	☐ N/A
	☐ Contingency plan/emergency response plan	☑ Readily available	☑ Up to date	☐ N/A
	Remarks			
3.	**O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☑ N/A
	Remarks			
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☑ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☑ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☑ N/A
	☐ Other permits	☐ Readily available	☐ Up to date	☑ N/A
	Remarks			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☑ N/A
	Remarks			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☑ N/A
	Remarks			
7.	**Groundwater Monitoring Records**	☑ Readily available	☑ Up to date	☐ N/A
	Remarks			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☑ N/A
	Remarks			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☑ N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☑ N/A
	Remarks			
10.	**Daily Access/Security Logs**	☑ Readily available	☑ Up to date	☐ N/A
	Remarks			

IV. O&M COSTS

1. **O&M Organization**
   - ☐ State in-house
   - ☐ Contractor for State
   - ☐ PRP in-house
   - ☐ Contractor for PRP
   - ☐ Federal Facility in-house
   - ☐ Contractor for Federal Facility
   - ☑ Other EPA Region 1, New England IAGs & Contracts.

2. **O&M Cost Records** N/A
   - ☐ Readily available ☐ Up to date
   - ☐ Funding mechanism/agreement in place
   - Original O&M cost estimate _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached

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

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

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☐ N/A
   Remarks No damage

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
   Remarks Signs in place.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

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

Type of monitoring (*e.g.*, self-reporting, drive by) Active site monitoring & construction
Frequency Five days per week for 4 mths monthly for rest of year
Responsible party/agency multiple (EPA, state, EPA contractors)
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
Not all ICs required in the 2007 ROD Amendment have been obtained yet.

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

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident
Remarks

2. **Land use changes on site** ☑ N/A
Remarks

3. **Land use changes off site** ☑ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☑ Applicable ☐ N/A

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

B. Other Site Conditions

Remarks No notable site conditions.

VII. LANDFILL COVERS ☐ Applicable ☑ N/A

A. Landfill Surface

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

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

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

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

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

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

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

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

9.	**Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability Areal extent_____ Remarks_____
B. Benches	☐ Applicable ☐ N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)
1.	**Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay Remarks_____
2.	**Bench Breached** ☐ Location shown on site map ☐ N/A or okay Remarks_____
3.	**Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay Remarks_____
C. Letdown Channels	☐ Applicable ☐ N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)
1.	**Settlement** ☐ Location shown on site map ☐ No evidence of settlement Areal extent_____ Depth_____ Remarks_____
2.	**Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation Material type_____ Areal extent_____ Remarks_____
3.	**Erosion** ☐ Location shown on site map ☐ No evidence of erosion Areal extent_____ Depth_____ Remarks_____

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

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

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

D. Cover Penetrations ☐ Applicable ☑ N/A

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

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

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

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

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

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

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

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

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

F. Cover Drainage Layer	☐ Applicable	☑ N/A

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

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

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

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

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

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

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

H. Retaining Walls ☐ Applicable ☑ N/A

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

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

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

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

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

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

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

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

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

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

C. Treatment System ☐ Applicable ☑ N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☐ Air stripping ☐ Carbon adsorbers
   ☐ Filters_____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☐ Others_____
   ☐ Good condition ☐ Needs Maintenance
   ☐ Sampling ports properly marked and functional
   ☐ Sampling/maintenance log displayed and up to date
   ☐ Equipment properly identified
   ☐ Quantity of groundwater treated annually_____
   ☐ Quantity of surface water treated annually_____
   Remarks_____

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

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

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

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

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

D. Monitoring Data

1. Monitoring Data
   ☐ Is routinely submitted on time ☐ Is of acceptable quality

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

D. Monitored Natural Attenuation N/A

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

X. OTHER REMEDIES

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

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

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

See Section 4.2
of the five-year review

B. Adequacy of O&M

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

See Section 4.3
of the 5-year review.

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None.

D.	***Opportunities for Optimization***
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None.

X. OTHER REMEDIES

OU3 In-situ Chemical Oxidation:

The permanent injection wells and monitoring wells that were installed during the summer of 2008 were found to be in excellent condition on the day of this inspection. See also Section 4.2.2 of the five-year review report.

OU4 Wetland Restoration:

The restored Country Pond Marsh appeared to be in excellent condition on the day of the inspection. Monitoring of the restored Country Pond Marsh from 2003 to the present clearly documents establishment of a productive and diverse plant community, dominated almost exclusively by herbaceous hydrophytic (wetland) plants. Hydrology, hummock and hollow topography, and soils are adequate to support development of a diverse, functional, wetland community. Conditions appear favorable for eventual development of a forested wetland, the ultimate objective of the restoration effort. See also Section 4.2.3 of the five-year review report.