Ohio E.P.A.
JUL 21 2015

Ohio Environmental Protection Agency

DECISION DOCUMENT

FOR THE REMEDIATION OF OPERABLE UNIT 15 DIAMOND SHAMROCK PAINESVILLE WORKS SITE PAINESVILLE TOWNSHIP, LAKE COUNTY, OHIO

Ohio Environmental Protection Agency
Division of Environmental Response and Revitalization
Northeast District Office
June 2015

I certify this to be a true and accurate copy of the official documents as filed in the records of the Ohio Environmental Protection Agency.

By: Date: 7-21-15

DECLARATION

SITE NAME AND LOCATION

Diamond Shamrock Painesville Works Site – Operable Unit 15
Fairport Nursery Road, Approximately 0.6 Mile West of East Street
Painesville Township, Ohio

STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the selected remedial action for Operable Unit 15 (OU15) of the Diamond Shamrock Painesville Works Site in Painesville Township, Lake County, Ohio, chosen in accordance with the policies of the Ohio Environmental Protection Agency, statutes and regulations of the State of Ohio, and the National Contingency Plan, 40 CFR Part 300.

ASSESSMENT OF THE SITE

Actual and threatened releases of hazardous substances at OU15, if not addressed by implementing the remedial action selected in the Decision Document, constitute a substantial threat to public health or safety and are causing or contributing to air or water pollution or soil contamination.

OU15 is part of the former Diamond Shamrock Painesville Works Site, which operated at this location from 1912 through 1977. Diamond Shamrock manufactured a variety of chemicals at the 1,100-acre Site. OU15 consisted of the former main manufacturing area where soda ash, baking soda, hydrochloric and sulfuric acids, and chlorinated compounds were manufactured. Diamond Shamrock also generated its own electricity from a coal-fired power plant located within OU15.

DESCRIPTION OF THE SELECTED REMEDY

The major components of the selected remedial alternative include: (1) remediation of areas containing chromium ore processing residue (COPR) through removal or capping and (2) establishment of an environmental covenant to ensure appropriate risk-based land use, limit ground water use, and prohibit construction below the applicable minimum points of compliance (POCs) across the OU.

STATUTORY DETERMINATIONS

The selected remedial action is protective of human health and the environment, complies with legally applicable state and federal requirements, is responsive to public participation and input and is cost-effective. The remedy uses permanent solutions to the maximum extent practicable to reduce toxicity, mobility and volume of hazardous substances at OU15. The effectiveness of the remedy will be reviewed regularly.

Craig W. Butler, Director

JUL 21 2015
Date

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TABLE OF ACRONYMS

AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirements
BERA	Baseline Ecological Risk Assessment
BHHRA	Baseline Human Health Risk Assessment
CCR	Construction Completion Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant(s) of Concern
COPC	Contaminant of Potential Concern
COPR	Chromite Ore Processing Residue
DERR	Division of Environmental Response and Revitalization
DFFOs	Director's Final Findings and Orders
ERA	Ecological Risk Assessment
FS	Feasibility Study
HI	Hazard Index
HQ	Hazard Quotient
IA	Interim Action
IAWP	Interim Action Work Plan
MCL	Maximum Contaminant Level
NCP	National Contingency Plan
O&M	Operation and Maintenance
OMZA	Outside Mixing Zone Average
OU(s)	Operable Unit(s)
POC(s)	Point(s) of Compliance
PPM	Parts Per Million = mg/kg or mg/L
PRG	Preliminary Remediation Goal
PRP	Potentially Responsible Party
RA	Remedial Action
RAO(s)	Remedial Action Objective(s)
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RG	Remediation Goal
RI	Remedial Investigation
RMP	Risk Management Plan
TDS	Total Dissolved Solids
WQS	Water Quality Standards

1.0 EXECUTIVE SUMMARY

On September 27, 1995, Chemical Land Holdings, Inc., Maxus Energy Corporation, Occidental Chemical Corporation, Painesville Township Board of Trustees, Uniroyal Chemical Company, Village of Fairport Harbor, and the Painesville PRP Group entered into Director's Final Findings and Orders ("DFFOs") with Ohio EPA to investigate and develop remedial alternatives for the Diamond Shamrock Painesville Works Site (see Figure 1, Site Location Map), and anywhere contamination may have migrated. Chemical Land Holdings, Inc., Maxus Energy Corporation, Occidental Chemical Corporation, Painesville Township Board of Trustees, Village of Fairport Harbor, and the Painesville PRP Group are also subject to a U.S. District Court Judicial Consent Order ("Consent Order"), effective on October 4, 2005, which required the continued implementation of the DFFOs requirement to investigate contamination at the Diamond Shamrock Site, including OU15. This OU is subject to both the DFFOs and the Consent Order. Accordingly, the term "Orders" is used to refer to both the DFFOs and the Consent Order.

The Painesville PRP Group developed Phase I and Phase II Remedial Investigation (RI) Work Plans, pursuant to the Orders, to determine where contamination exists at the Site and at what concentrations. The Phase I RI Work Plan was approved in August 1997 and the Phase II RI Work Plan was approved in August 2000, to investigate the Site for potential contamination of soil, ground water, surface water and indoor air.

On July 25, 1999 and September 22, 2003, respectively, the Phase I and Phase II RI Reports were approved by Ohio EPA. These reports documented the existence of contamination within the Site boundaries which would require clean up. The primary contaminants of concern within OU15, prior to interim action (IA) activities discussed below, are presented in Table 2, Areas of Contamination within Operable Unit 15 (pre-interim action), of this Decision Document.

During the course of RI activities, the Diamond Shamrock Painesville Works Site was divided into 24 operable units (OUs). This decision document applies to Operable Unit 15 (OU15), which is located on the northern side of Fairport Nursery Road (see Figure 2, Operable Unit 15 Location Map).

On February 27, 2003, the Lake County Board of Commissioners and Lakeview Bluffs, LLC received a $3 million grant from the State of Ohio to perform a voluntary interim action for OU15, which would upgrade the end use of OU15 from industrial land use, which would have been required under the existing Orders[1], to a mixture of commercial, recreational and residential land use. As part of the Interim Action Work Plan (IAWP), which was approved by Ohio EPA on November 30, 2004, a Baseline Human Health Risk Assessment (BHHRA) was prepared, which defined the concentrations of contamination within OU15 that could impact human health. A Baseline Ecological Risk Assessment (BERA) for potential impacts to the environment was not conducted for OU15, based on continual maintenance of the existing surface and planned redevelopment activities. The BHHRA determined that current and future health risks of this OU resulted from: direct contact with surface and sub-surface

[1] Since OU15 was zoned industrial, formerly contained industrial manufacturing facilities, and the property owner had no plans to use the property for anything other than industrial purposes, Ohio EPA would have only been able to require that the property be remediated to industrial standards.

contaminated soils, volatile emissions from soils and ground water, and direct contact with contaminated ground water.

Remedial activities specified in the IAWP were performed from 2004 through 2007 and included the excavation of contaminated soils and placement of clean soils to meet a minimum 2' point of compliance (POC) in commercial/recreational use areas and a minimum 4' POC in residential use areas. In excess of 280,000 cubic yards of clean clay soil and another 60,000 cubic yards of clean topsoil were placed within the boundaries of OU15 during these activities.

During and immediately following performance of the IA, additional sampling was performed within OU15. This included the confirmation of BIOSCREEN modeling results in Lake Erie and Grand River surface water and partial delineation of chromite ore processing residue (COPR) north of Fairport Nursery Road.

Contaminants of Potential Concern (COPCs) for Lake Erie surface water included antimony, cobalt, selenium and total dissolved solids (TDS). Cyanide and TDS were the only COPCs identified for Grand River surface water. Sampling performed in Lake Erie and the Grand River indicated neither TDS nor any of the metals listed above are reaching either water body in concentrations above the State of Ohio Water Quality Standards (WQS), Outside Mixing Zone Average (OMZA) for the Lake Erie basin.

During routine storm sewer installation activities performed outside of the scope of CORF and RI/FS activities, COPR was identified at depths greater than 8' below ground surface within OU15, north of Fairport Nursery Road. The COPR was a waste generated as part of chromium production activities within OU16 of the former Diamond Shamrock Painesville Works Site. The COPR contains significant levels of hexavalent chromium, a known human carcinogen, and has the rare property of being able to wick upwards through soils, rather than leaching downward. This requires COPR to be remediated, even when encountered at depths below the applicable POC. It was determined that additional work would be needed in the COPR Area of Concern (see Figure 5) as part of remedial design/remedial action (RD/RA) activities to identify the extent of the COPR within OU15 and either cap or remove the material.

Following completion of IA activities, a final Construction Certification Report (CCR) was submitted to Ohio EPA on September 7, 2007, summarizing the remedial work which was performed. In addition, the report contained a post-remedy risk assessment, providing an evaluation of current risks posed by contaminants remaining on OU15. Ohio EPA approved the CCR on October 10, 2007.

The post-remedy risk assessment determined that there were five (5) primary contaminants of concern (COCs) which remain in soils within OU15. These include: aluminum, dieldrin, hexavalent chromium, manganese, and vanadium. Additional details concerning the health risks associated with each primary COC are located in Appendix B, Primary Contaminants of Concern.

Based on this information, it was determined that remedial alternatives needed to be developed to address human health risks posed by OU15 soils. In October 2007, Ohio EPA

approved a Feasibility Study (FS) report, which identified potential remedial alternatives for OU15. As part of the FS, a number of Remedial Action Objectives (RAOs) for OU15 were developed to ensure protectiveness of human health and the environment.

A preferred plan was issued in May 2008, which presented a range of remedial alternatives for public consideration and comment. The alternatives evaluated in the preferred plan are included in Section 4.0 of this document.

On December 21, 2009, Ohio EPA issued a Director's Determination Report to the Ohio Department of Development to document that applicable risk-based standards had been met due to the remediation performed under the voluntary interim action and partially funded through the CORF. The report also explained that, while the property was currently in compliance with residential and commercial/recreational standards, additional remedial activities would be required to address potential future risk. These activities included establishment of an environmental covenant, and capping or removal of COPR in the southeastern corner of OU15.

Following issuance of the Preferred Plan, Tierra Solutions, Inc. requested permission to relocate material stockpiled during the OU15 slope re-grading work discussed above. The stockpile consisted of a mixture of soil and Solvay material (calcium carbonate fines). The stockpile was characterized and determined to meet residential risk-based standards and was moved to OU7 in July 2013.

All of the documents referenced above can be found in the public repositories identified in Section 8.0, Responsiveness Summary.

This Decision Document summarizes information on the range of remedial alternatives evaluated, identifies Ohio EPA's selected remedial alternative, and explains the reasons for selection of the remedial alternative. The Decision Document is based on the Ohio EPA-approved RI and FS reports completed by SECOR, Inc. and Hull & Associates, Inc., on behalf of Tierra Solutions, Inc.

Ohio EPA's selected remedial alternative should yield a permanent solution for risks associated with the contaminated media at OU15. The expectations for the selected alternative include:

- Reduction of human health risks to within acceptable limits, and protection of human health and the environment from exposure to COCs in soils and ground water (Figures 3 and 4), which are above acceptable limits.
- Short and long-term protection of public health and the environment.
- Compliance with applicable or relevant and appropriate requirements (ARARs).
- Cost-effectiveness and limitation of expenses to what is necessary to achieve the selected alternative expectations.

The major components of the selected remedial alternative include remediation of the COPR area identified in Figure 4 of this Decision Document, establishment of an Environmental Covenant (EC) to restrict property and ground water use, and establishment of a Risk Management Plan (RMP) for future construction activities which occur below the applicable 2' or 4' minimum point of compliance (POC).

Ohio EPA finds that these measures will protect public health and the environment by reducing risk to acceptable levels once the RAOs have been achieved.

2.0 SUMMARY OF OPERABLE UNIT CONDITIONS

2.1 Operable Unit History

The Diamond Shamrock Painesville Works Site ("Site") is an approximately 1,100 acre former chemical manufacturing facility located in a mixed industrial/residential area. The Site is situated in the northern portion of Lake County, within the municipalities of the city of Painesville, Painesville Township and the Village of Fairport Harbor. East Street borders the Site to the west, Elm Street to the south and Lake Erie to the north. The Site borders the former Uniroyal Chemical Company and Cleveland Electric Illuminating Company property to the east. The Grand River and Fairport Nursery Road bisect the Site from east to west (Figure 1, Diamond Shamrock Location Map).

In order to facilitate the RI/FS and RD/RA processes, the Site has been divided into 24 OUs – 21 land-based and 3 ground water-based OUs. OU15, which is approximately 99 acres in size, is located in the north-central portion of the Site between the Grand River and Lake Erie (Figure 2, Operable Unit 15 Location Map) and consists of Parcels 1B1, 1B2 and 5B1.

A list of owners, operators and/or disposers that may have contributed to the contamination within OU15 is shown in Table 1 Owners, Operators and/or Disposers.

TABLE 1 OWNERS, OPERATORS AND/OR DISPOSERS

Owners, Operators and/or Disposers	Property Usage	Period
Diamond Alkali / Diamond Shamrock	*Manufacturing of Soda Ash, sodium carbonate, magnesium oxide, sodium bicarbonate, sodium hydroxide, chlorinated chemicals, hydrochloric and sulfuric acids, electricity production, and salt solution mining.*	*1912 – 1976*
Standard Machine & Equipment Company (SME)	*Demolition of the main plant (Parcels 1B1 and 1B2, north of Fairport Nursery Road) and relocation of demolition debris to former hydroretention basin (Parcel 5B1).*	*1978 - 1996*

plans to utilize it for commercial, recreational, and residential development. Descriptions of historical activities on the individual parcels are provided below:

Parcel 1B1

Parcel 1B1 is approximately 66 acres in size. It is bordered by Lake Erie and Parcel 1B2 to the north and Fairport Nursery Road and the Norfolk and Southern Railway (OU22) to the south. OU2 and OU6 border this parcel to the east and active commercial/industrial operations and residential structures border it to the west.

Parcel 1B1 is the former main manufacturing portion of the Diamond Shamrock Painesville Works. This area contained manufacturing facilities for soda products; chlorinated chemicals and acids; a power plant, which generated electricity for manufacturing operations; and salt solution mining wells. This parcel historically contained a large number of buildings which were demolished in the 1980s by SME. Their foundations were covered with soil and remain in place.

In addition to former production facilities, the initial soup pond or waste lake, used for liquid and sludge disposal from manufacturing activities, was located within Parcel 1B1. These wastes consisted primarily of limestone fines suspended in water, known as Solvay, which was produced in vast quantities during the manufacturing of soda ash within OU15.

Parcel 1B2

Parcel 1B2 is approximately 5 acres in size and is located on the north-central portion of the Site. The parcel is bordered by Lake Erie to the north and Parcel 1B1 to the east, west, and south.

This parcel historically contained the fresh water intake and pump house for the Diamond Shamrock manufacturing facility. The parcel was purchased by the Lake County Commissioners in 1977 as a backup intake location. In 1999 it was purchased by Tierra Solutions, Inc. and the intake was plugged and all structures demolished.

Parcel 5B1

Parcel 5B1 is approximately 28 acres in size and is located in the center of the Site. It is bordered by Fairport Nursery Road to the north, OU16 and OU20 to the east, OU7 to the west, and the Grand River to the south.

This parcel was historically known as the Hydroretention Basin. Waste water was pumped into this basin for additional settling prior to discharge into the Grand River. During OU15 demolition activities in the 1980s, building debris from Parcel 1B1 was placed within Parcel 5B1 and covered with soil.

Chemical Land Holdings, Inc., Maxus Energy Corporation, Occidental Chemical Corporation, Painesville Township Board of Trustees, Village of Fairport Harbor, and the Painesville PRP

Chemical Land Holdings, Inc., Maxus Energy Corporation, Occidental Chemical Corporation, Painesville Township Board of Trustees, Village of Fairport Harbor, and the Painesville PRP Group are subject to the Orders, which require them to investigate contamination at the Site, including OU15.

2.2 Site Characteristics and Investigation

Pursuant to the 1995 DFFOs for the RI/FS, the Painesville PRP Group, on behalf of all of the signatories to the 1995 DFFOs, submitted Phase I and Phase II RI and FS reports, which were approved by Ohio EPA, DERR in 1999, 2003, and 2007, respectively. The RI/FS activities identified the nature and extent of contamination in surface and subsurface soils; ground water; surface water and sediments for the volatile and semi-volatile organic compounds, pesticides, PCBs, and metals; and as necessary, developed alternatives to address the contamination. The investigation also provided a description of site geology, topography, hydrogeology and other Site characteristics.

Geology at the Diamond Shamrock Painesville Works Site, including OU15, is complex. The subsurface geology consists of a mixture of non-native fill material (including large amounts of Solvay material within the former waste lakes/soup ponds), glacial tills, alluvial deposits, and shale bedrock. Ground water is present across the Site at varying depths. Ground water quality is poor and in the majority of areas yield is very poor, which limits the ability for its use for potable purposes. For these reasons, it was determined that ground water did not need to be evaluated for risk to human health, with the exception of direct contact by future construction workers. However, ground water was evaluated as a potential contributor of contamination to both the Grand River and Lake Erie.

No ground water supply wells are located within the immediate vicinity of the Site and the area is served by public water from Lake Erie. A ground water divide, located north of Fairport Nursery Road (within a portion of OU15), as well as the Grand River and Lake Erie, complicate ground water flow direction and contaminant transport across the Diamond Shamrock Site. One (1) jurisdictional wetland has been identified on the Site and is located within OU21.

In addition to the ground water divide, the presence of the Norfolk Southern railroad line (currently OU22), which transect the middle of the Site from east to west, and the former East Ohio Gas high-pressure transmission line (within OU15) complicated investigatory activities. The East Ohio Gas transmission line was relocated in 2008, allowing for the collection of subsurface samples and covering or removal of contaminated material.

During the majority of the investigation, the Site was zoned industrial, which matched the historical use of the Site. On February 27, 2003, the Lake County Board of Commissioners and Lakeview Bluffs, LLC received a $3 million grant from the State of Ohio to perform a voluntary interim action for OU15, which would upgrade the end use of OU15 from industrial to a mixture of commercial, recreational and residential[2]. The majority of the OUs at the Site, including OU15, have been re-zoned to accommodate these end uses. The property

[2] Since OU15 was zoned industrial, formerly contained industrial manufacturing facilities, and the property owner had no plans to use the property for anything other than industrial purposes, Ohio EPA would have only been able to require that the property be remediated to industrial standards.

surrounding the OU15 is a mixture of commercial/industrial/residential to the west and south, and industrial to the east (Lake Erie is located to the north).

In 2003, Hemisphere Corporation and the Lake County Commissioners received a $3 million grant from the Clean Ohio Revitalization Fund (CORF) to "upgrade" the end use of OU15 to a combination of commercial, recreational and residential. A BHHRA was presented within the IAWP. This BHHRA was developed to estimate the chance of health problems occurring if no cleanup actions were taken within OU15. A BERA was not required, because OU15 is maintained (i.e., mowed), which eliminates habitat available to most ecological receptors. Please refer to the RI and FS reports and IAWP (including the BHHRA) for more detailed information. These reports, along with other Site-related materials, are located in the information repositories in the Fairport Harbor Public Library and Morley Library in Painesville. Information can also be obtained through the Diamond Shamrock Community Relations Team web site (www.dscrt.com) and in Ohio EPA's Northeast District Office.

Data from the Phase I and Phase II RI reports, prepared in 1999 and 2003 by SECOR International Incorporated on behalf of the Painesville PRP Group and the other signatories to the 1995 DFFOs, were used by Hull & Associates, Incorporated, to create the 2004 IAWP. The IAWP identified 19 areas with levels of contaminants at risk levels in excess of those permissible for the planned end use (Table 2, Areas of Contamination within OU15 (pre-interim action), and Figure 3, Operable Unit 15 Sampling Locations – Pre-Interim Action). The majority of these areas were addressed as part of the IAWP implementation, as discussed below in Section 2.3.

TABLE 2, AREAS OF CONTAMINATION WITHIN OU15 (PRE-INTERIM ACTION)

Area of Contamination	Location	Size (ft^2)	Risk Exceeded For Risk Goal Type	Contaminants
DC-1	*NW Portion of Parcel 1B1*	*17,740*	*Modified Residential**	*Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Dibenzo(a,h)anthracene Aroclor-1248 Aroclor-1254*
DC-2	*W Portion of Parcel 1B1*	*53,300*	*Modified Residential*	*Benzo(a)anthracene Benzo(a)pyrene Aroclor-1254 Aroclor-1260*
DC-3	*NW Portion of Parcel 1B1*	*13,700*	*Modified Residential*	*Thallium*
DC-4	*S Boundary of Parcels 1B1 and 1B2*	*8,650*	*Modified Residential*	*Aroclor-1254*
DC-5	*SE Boundary of Parcels 1B1 and 1B2*	*15,500*	*Modified Residential*	*Mercury*
DC-6	*NE Portion of Parcel 1B1*	*9,005*	*Modified Residential*	*Aroclor-1260*

TABLE 2, AREAS OF CONTAMINATION WITHIN OU15 (PRE-INTERIM ACTION)				
Area of Contamination	**Location**	**Size (ft^2)**	**Risk Exceeded For Risk Goal Type**	**Contaminants**
DC-7	NE Portion of Parcel 1B1	35,836	Modified Residential	Arsenic
DC-8	S Portion of Parcel 1B1	20,637	Modified Residential	Aroclor-1260
DC-9	N Portion of Parcel 5B1	26,081	Recreational	Arsenic
IA-1	NW Portion of Parcel 1B1	20,000	Indoor Air	Carbon Tetrachloride
IA-2	S Portion of Parcel 1B1	22,800	Indoor Air	Carbon Tetrachloride
IA-3	N Portion of Parcel 1B1	14,811	Indoor Air	Chloroform
IA-4	SW Portion of Parcel 1B1	11,000	Indoor Air	1,1-Dichloroethylene Carbon Tetrachloride Chloroform Trichloroethylene Perchloroethylene
DC/IA-1	SE Portion of Parcel 1B1	315,500	Modified Residential and Indoor Air	Arsenic Mercury Vanadium Benzene Benzo(a)anthracene Benzo(a)pyrene Dibenzo(a,h)anthracene Carbon Tetrachloride Chloroform Vinyl Chloride Cyanide 1,2-Dichloroethane Trichloroethylene Perchloroethylene Aroclor-1248 Aroclor-1254
DC/IA-2	E Portion of Parcel 1B1	14,200	Modified Residential and Indoor Air	Carbon Tetrachloride
DC/IA-3	Central Portion of Parcel 1B1	12,650	Modified Residential and Indoor Air	Benzene Carbon Tetrachloride Aroclor-1248 Aroclor-1254
DC/IA-4	S Portion of Parcel 1B1	94,500	Modified Residential and Indoor Air	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Dibenzo(a,h)anthracene Carbon Tetrachloride Aroclor-1254

TABLE 2, AREAS OF CONTAMINATION WITHIN OU15 (PRE-INTERIM ACTION)				
Area of Contamination	**Location**	**Size (ft^2)**	**Risk Exceeded For Risk Goal Type**	**Contaminants**
DC/IA-5	*NE Portion of Parcel 5B1*	*102,420*	*Recreational and Indoor Air*	*Aluminum Arsenic Chloroform*
DC/IA-6	*SE Portion of Parcel 5B1*	*17,900*	*Recreational and Indoor Air*	*Arsenic Lead Thallium Perchloroethylene*

* Residential land use is considered "modified" due to the adjusted 4' minimum point of compliance.

2.3 Interim or Removal Actions Taken to Date

As previously mentioned, the Lake County Board of Commissioners and Lakeview Bluffs, LLC received a $3 million grant from the State of Ohio's Clean Ohio Revitalization Fund (CORF) on February 27, 2003. The purpose of the grant was to assist the Site developer, Lakeview Bluffs, LLC, in upgrading the end use of the Site from industrial to a mixture of commercial, recreational and residential. The work was performed as a voluntary IA under the existing Orders.

The initial objective for clean-up was based on industrial use because of historical and proposed future uses of the Site. However, in February 2001, Chemical Land Holdings, Inc. (now known as Tierra Solutions, Inc.) entered into a 99-year lease agreement with Lakeview Bluffs, LLC, which changed the planned end use of the Site to a combination of commercial, recreational and residential. Under a voluntary IA, Chemical Land Holdings, Inc. (now Tierra Solutions, Inc.) paid to remediate the Site to industrial use and Lakeview Bluffs, Inc. used the CORF grant money in combination with other funding to upgrade the remediation to meet commercial, recreational and residential risk-based standards.

During the voluntary IA, 16 of the 19 areas of contamination listed in Table 2, Areas of Concern within OU15 (pre-interim action), were remediated through a combination of excavation and relocation or disposal of soils and placement of clean soils[3]. Commercial and recreational areas were required to meet a 2' minimum point of compliance (i.e., a minimum of 2' of clean soils must be present above area of contamination). Residential areas were required to meet a minimum 4' point of compliance.

Significant remedial and development-related work was performed along the Lake Erie shoreline, including grading activities to create a walking path and amphitheater area. Erosion control structures were installed along Lake Erie, within Parcels 1B1 and 1B2, to prevent further loss of shoreline.

[3] COPR, which was discovered in the south-eastern portion of OU15 in 2007 during storm sewer installation activities, is not included in Table 2.

In 2007, during installation of a storm sewer, sub-surface COPR was identified within OU15. An IA was conducted to delineate this COPR area. Results revealed that COPR had been disposed in an area of at least 8,000 ft^2 (Figure 4, COPR Area of Concern). As previously discussed, COPR was a waste generated as part of chromium production activities at the former Diamond Shamrock manufacturing facility. COPR contains significant levels of hexavalent chromium, a known human carcinogen, and has the rare property of being able to wick upwards through soils, rather than leaching downward. Because of this property, COPR requires remediation on the Site, including OU15, even when encountered at depths below the applicable POC.

Following completion of IA activities, the Construction Certification Report (CCR) was submitted to Ohio EPA, which summarized the remedial work that was performed. The report contained a post-remedy risk assessment, providing an evaluation of remaining risks posed by contaminants on the Site. These risks are discussed in Section 2.4 of this Decision Document. The CCR was approved by Ohio EPA on October 10, 2007.

2.4 Summary of Site Risks

Remediation work performed during the voluntary IA was based on the BHHRA presented in the IAWP. As stated above, after the IA activities were completed, a CCR was submitted to Ohio EPA. This report documented, through a post-remedy risk assessment, that the majority of OU15 met commercial, recreational and/or residential use, as long as the minimum points of compliance and use limitations were enforced through an Environmental Covenant (EC).

The results from the RI demonstrated that soil contamination in four (4) areas of concern (AOCs) within OU15 posed, or potentially posed, unacceptable risks and/or hazards to human and/or ecological receptors sufficient to trigger the need for remedial actions (Figure 4, Soil/Indoor Air AOCs and Remedy Locations). The primary constituents of concern in these areas included aluminum, dieldrin, hexavalent chromium, manganese and vanadium. Based on additional excavation along the Lake Erie shoreline and a revision to the land use plan, three (3) of the four AOCs[4] no longer pose unacceptable risk. The remaining AOC is the area of COPR contamination identified in Figure 5.

In addition to hexavalent chromium contamination within soils, it was determined that unacceptable post-interim action indoor air risk exists for future residents and recreational users in certain portions of OU15 (Figure 4, Soil/Indoor Air Areas of Concern and Remedy Locations). This risk can be eliminated through the establishment of an EC, which would prohibit construction of habitable structures in these areas, as well as prohibit the construction of basements and crawl spaces across OU15.

2.4.1 Risks to Human Health

The risk assessment for human health is an estimate of the likelihood of potential health problems occurring if no remedial actions were taken at a site. To estimate baseline risk, a four-step process is undertaken.

[4] Three (3) of the AOCs are included in Table 2. The remaining AOC consists of the COPR area identified in 2007.

Step 1. Data Collection and Evaluation (of Contamination): The concentrations of contaminants at the site as well as any past scientific studies on the effects these contaminants have had on people are reviewed. Comparisons of site-specific concentrations of COCs and concentrations reported in past studies help determine which contaminants are most likely to pose the greatest threat to human health.

Step 2. Exposure Assessment: The different ways that people might be exposed to the COCs, the concentrations that people might be exposed to, and the potential frequency and duration of exposure are evaluated. A reasonable maximum exposure scenario is calculated, which portrays the highest level of human exposure that could reasonably be expected to occur.

Step 3. Toxicity Assessment (of Potential Health Dangers): The information from Step 2 is combined with data on the toxicity of each COC to assess potential health risks. Two types of risk are considered: excess lifetime cancer risk (ELCR) and non-cancer risk. The likelihood of any kind of cancer resulting from a site is expressed as a probability of 1 in 100,000, or $1x10^{-5}$. In other words, for every 100,000 people that could be exposed, one extra case of cancer may occur as a result of exposure to site COCs. For non-cancer health effects, a hazard index (HI) or hazard quotient (HQ) is calculated (quotient refers to the effects of an individual COC, whereas index refers to the combined effects of all of the COCs). The key concept here is that a "threshold level" (measured as an HQ or HI of 1) exists below which non-cancer health effects are not expected to occur to exposed populations or individuals.

Step 4. Risk Characterization: A determination is made as to whether site risks are substantial enough to cause potential health problems for people at or near a site. The potential risks from the individual pathways (*e.g.*, inhalation, direct contact, ingestion, etc.), and individual chemicals as appropriate, are added together to determine the total cumulative risk to human health.

Human health risk assessments for OU15 and the Grand River/Lake Erie were prepared to evaluate potential impacts to human health posed by COCs in soils, sediments, ground water surface water, air, and fish for the following exposure pathways:

<u>Soils</u>:

Ingestion
Dermal Contact
Particulate Emissions to Outdoor Air
Volatile Emissions to Indoor Air
Volatile Emissions to Indoor Air

<u>Ground Water</u>:

Source of Contaminants to Grand River and Lake Erie
Volatile Emissions to Indoor Air

Grand River Surface Water, Sediment and Fish:

Ingestion of Fish
Ingestion of Surface Water
Ingestion of Sediment
Dermal Contact with Surface Water
Dermal Contact with Sediment

Human health exposure to contaminants in ground water via ingestion was not determined, due to inability for ground water within the Diamond Shamrock Site, including OU15, to be used for potable purposes, due to low quality and yield. If Site-specific data were not available or were insufficient to modify standard default values, then the standard defaults provided in U.S. EPA guidance were used.

A previously discussed the BHHRA results were used to design the remedial activities completed under the voluntary IA. Following completion of the IA a post-remedy risk assessment was completed. A summary of the risk identified pre- and post-IA are provided below.

Pre- and post-interim action human health risks were calculated for OU15 receptors, which included the construction/excavation worker, golf course worker, long-term maintenance worker, child and adult engaging in recreational activities, and child and adult resident. These human health risks included exposure to Grand River surface water, sediment and fish, as applicable. Excess lifetime cancer risk (ELCR) and the non-cancer hazard index (HI) were determined for each of the receptors. As stated above, ELCR values which exceed $1x10^{-5}$ and HI values which exceed 1 trigger the need for remedial action.

Cumulative Receptor Exposures – Pre-Interim Action

Receptor*	ELCR (cancer)	HI (non-cancer)	Exceedences?
Construction/Excavation Worker	$5x10^{-5}$	10	Yes – Both
Golf Course Worker	$4.62x10^{-4}$	1.10	Yes – Both
Long-Term Maintenance Worker	$7.6x10^{-6}$	30	Yes – Both
Adult-Recreational	$7.6x10^{-5}$	0.92	Yes – ELCR
Child-Recreational	$1.7x10^{-4}$	7.9	Yes – Both
Adult-Resident	$5.4x10^{-2}$	33.4	Yes – Both
Child-Resident	$5.5x10^{-2}$	49.2	Yes – Both

The Child-Resident and Child-Recreational receptors are the ones which provide the most protective estimate of risk. If the risks to the Child-Resident and Child-Recreational receptors are acceptable, then they are acceptable for all other receptors. Therefore, only the risks for the Child-Resident and Child-Recreational receptors were calculated as part of the post-IA risk assessment. These calculations took into account the minimum applicable points of compliance (POCs), which were established for OU15. The POC for residential receptors is 4' (i.e., a minimum of 4' of soils which meet residential risk must be maintained across the

surface of residential areas) and 2' for commercial and recreational areas (i.e., a minimum 2' of soils which meet recreational risk must be maintained across the surface of commercial and recreational areas).

Cumulative Receptor Exposures – Post-Interim Action

Receptor	ELCR (cancer)	HI (non-cancer)	Exceedances?*
Child-Recreational	$8.8x10^{-7}$	0.21	No
Child-Resident	$2.2x10^{-6}$	0.72	No

*Assuming minimum applicable POCs have been established.

Although these risks and hazard levels do not indicate that there is significant potential risk to children and adults (and therefore other receptors) from direct contact with or inhalation of OU15-related contaminants, hexavalent chromium does remain within OU15 at depths below the applicable minimum POC. Should this hexavalent chromium migrate upwards into that POC in the future, both adults and children could be at risk. This potential warrants the remediation of hexavalent chromium to concentrations at or below the calculated Site-specific risk-based remediation goal of 467 mg/kg.

2.4.2 Risks to Ecological Receptors

During the Phase II RI, Ohio EPA determined that a Baseline Ecological Risk Assessment (BERA) was not necessary for OU15 due to the continual maintenance of the soil cover in this OU (i.e., mowing, dissuading groundhogs, etc.), as well as the planned future development activities. The Painesville PRP Group is required to conduct an Ecological Risk Assessment for OU15, should future use of the OU change to one which will support ecological receptors.

The BIOSCREEN modeling results presented in the June 2003, *Baseline Ecological Risk Assessment*, submitted by Hull & Associates on behalf of the Painesville PRP Group indicated that Total Dissolved Solids (TDS), antimony, cobalt, and selenium could potentially reach Lake Erie and the Grand River at levels in excess of the State of Ohio WQS, OMZA. Confirmatory sampling was performed to determine if contaminants were reaching Lake Erie and/or the Grand River in concentrations which would pose a risk to ecological receptors. The results were negative, indicating that contaminants were not reaching these water bodies via ground water at levels which violated State WQS. Therefore, there is no current risk posed to ecological receptors from ground water impacting either Lake Erie or the Grand River.

3.0 REMEDIAL ACTION OBJECTIVES

An FS, to define and analyze appropriate remedial alternatives, was completed with Ohio EPA oversight and was approved in October 2007.

As part of the RI/FS process, remedial action objectives (RAOs) were developed in accordance with Section 300.430 of the NCP, pursuant to the federal Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 U.S.C.

§9601 et seq., as amended, and U.S. EPA guidance (*i.e.*, RI/FS Guidance (EPA/540/G-89/004, and others). The RAOs are goals that a remedy should achieve in order to ensure protection of human health and the environment.

The RAOs for OU15 include those listed in **Table 3 Remedial Action Objectives**:

TABLE 3 REMEDIAL ACTION OBJECTIVES	
Ground Water	
Human Health Risk	Prevent ingestion/direct contact of ground water across OU15 containing carcinogens in excess of a total excess lifetime cancer risk (for all contaminants) greater than $1x10^{-5}$.
Human Health Risk	Prevent ingestion/direct contact of ground water across OU15 containing non-carcinogens in excess of a HQ or HI greater than 1.
Human Health Risk	Prevent inhalation in future structures of carcinogens (including 1,2-Dichloroethane, Benzene, Carbon Tetrachloride, Chloroform, Tetrachloroethene, Trichlorethene, and Vinyl Chloride) in vapors emanating from ground water in excess of a $1x10^{-5}$ excess lifetime cancer risk.
Human Health Risk	Prevent inhalation in future site structures of non-carcinogens (including 1,1-Dichloroethene) in vapors emanating from ground water in excess of a HQ or HI of 1.
Soil	
Human Health Risk	Prevent ingestion/direct contact with soil located across OU15, below the applicable minimum points of compliance, containing carcinogens (including volatile and semi-volatile chemicals, pesticide, PCBs and metals) in excess of a total excess lifetime cancer risk greater than $1x10^{-5}$.
Human Health Risk	Prevent ingestion/direct contact with soil located across OU15, below the applicable minimum points of compliance, containing non-carcinogens (including volatile and semi-volatile chemicals, pesticide, PCBs and metals) in excess of a HQ or HI greater than 1.
Human Health Risk	Prevent inhalation in future site structures of carcinogens (including 1,2-Dichloroethane, Benzene, Carbon Tetrachloride, Chloroform, Tetrachloroethene, Trichloroethene, and Vinyl Chloride) in vapors emanating from soil in excess of a $1x10^{-5}$ excess lifetime cancer risk.
Human Health Risk	Prevent inhalation in future site structures of non-carcinogens (including 1,1-Dichloroethene) in vapors emanating from soil in excess of a HQ or HI of 1.

OU-specific remediation goals were not developed as part of the BHHRA because a post-remedy risk assessment was performed. The purpose of the post-remedy risk assessment was to document that OU15 met commercial/recreational and/or residential standards; however, four (4) areas of concern remained within OU15 (see Section 2.3, above). A Site-specific remediation goal for hexavalent chromium of 467 mg/kg (ppm) was developed due to the presence of COPR within OU15. This goal is protective of the most sensitive receptor, the child resident.

4.0 SUMMARY OF REMEDIAL ALTERNATIVES

A total of three (3) remedial alternatives were considered in the FS, as identified in **Table 4 Summary of OU15 Remedial Alternatives**. A brief description of the major features of each

of the remedial alternatives follows. More detailed information about these alternatives can be found in the FS report.

TABLE 4 SUMMARY OF OU15 REMEDIAL ALTERNATIVES		
Media	**Alternative**	**Description of Remedial Alternative**
Soil		
	S1	No action
	S2	EC restricting land use.
	S3	EC restricting land use and delineation/remediation of COPR areas.
Ground Water		
	G1	No Action
	G2	EC prohibiting use of ground water for potable and non-potable purposes, with the exception of environmental investigations.

4.1 No Action Alternatives (S1 and G1)

The "no action alternatives" for soil and ground water have been included in a single section for efficiency. The NCP requires evaluation of a no action alternative to establish a baseline for the comparison of other remedial alternatives. Under this alternative, no remedial activities or monitoring are conducted at OU15 to prevent exposure to contaminated media.

4.2 Soil Alternatives

Alternative S2: ALT OU15-B

This alternative would rely on the establishment of an EC, which includes:

- Prohibition of residential development on portions of OU15 which do not meet residential risk-based standards and restrict those portions to commercial/recreational use with the applicable minimum 2' POC (see Figure 4 and Table 3);
- Establishment of a minimum 4' POC in those portions of OU15 designated for residential use (see Figure 4);
- Prohibition of excavation below the applicable minimum 2' POC in the areas of OU15 designated as commercial/recreational use and below the applicable minimum 4' POC in the areas of OU15 designated as residential land use (see Figure 4);
- Prohibition of construction of habitable structures at specific locations in OU15 (see Figure 4) where unacceptable risk exists to human health due to volatilization of contaminants into indoor air (see Table 3);
- Prohibition of the construction of sub-grade habitable structures (i.e., basements and/or crawl spaces) across the entirety of OU15;

- Prohibition of the extraction of ground water for potable or non-potable use within OU15, with the exception of environmental investigation, remediation and monitoring; and

- Establishment of annual reporting requirement describing compliance with the environmental covenant, including POCs.

- Prohibition of excavation by construction workers unless the excavation is performed in accordance with an Ohio EPA approved risk management plan (RMP), which would apply to soils beneath the approved points of compliance (POCs) that may be made available for direct contact during excavation activities, as well as potentially contaminated shallow ground water. This RMP would address health and safety precautions to be taken by workers excavating below the POCs, as well as how to manage potentially contaminated soils and materials.

Alternative S3: ALT OU15-C

In addition to the requirements outlined in Alternative S2, above, this remedial alternative also requires that areas within OU15 containing hexavalent chromium concentrations above the risk-based remedial goal of 467 mg/kg be delineated and remediated through either removal or capping in place, and the prohibition of any excavation in the area covered by an engineered cap or installed as part of COPR-remediation activities. An engineered cap would consist of a 12" base layer of compacted clay, followed by geotextile, geomembrane (40 ml synthetic liner), and another 12" of compacted clay, as was installed in Operable Unit 2 of the Diamond Shamrock Painesville Works Site (see *Additional Work Work Plan for OU2 Chromium Impacted Soils Cover*, Hull & Associates, November 22, 2006). The geomembrane would act as a capillary break to prevent future upward migration of hexavalent chromium into the applicable POC.

4.3 Ground Water Alternative G2: ALT OU15-B and ALT OU15-C

The ground water RAOs would be satisfied by the establishment of an EC, which includes:

- Prohibition of the extraction of ground water for potable and non-potable use, with the exception of environmental investigation, remediation and monitoring.

- Prohibition of construction of habitable structures at specific locations in OU15 (see Figure 4) where unacceptable risk exists to human health due to volatilization of contaminants from ground water to indoor air (see Section 3.0).

4.4 Cost Estimates and Time to Achieve RAOs

Alternative S1/G1 – ALT OU15-A

This baseline alternative has no associated costs, since no remedial activities, including the placement of use restrictions, would be performed. RAOs are not achieved under this alternative.

Alternative S2/G2 – ALT OU15-B

The estimates of cost and time to achieve RAOs for the EC/RMP remediation alternative, which would restrict property use and require the establishment of an RMP, are as follows:

Estimated Capital Cost	$31,000.00
Estimated Annual Reporting Cost	$3,000.00
Estimated Present Worth Cost	$91,000.00
Estimated Construction Time	None
Estimated Time to Achieve RAOs	60 days

Alternative S3/G2 – ALT OU15-C

The estimates of cost and time to achieve RAOs for this combined EC/RMP/active remediation alternative, which would restrict property use, require the establishment of an RMP, and require delineation and remediation of COPR, are as follows:

Estimated Capital Cost	$292,000.00
Estimated Annual Reporting Cost	$5,000.00
Estimated Present Worth Cost	$390,000.00
Estimated Construction Time	2 years
Estimated Time to Achieve RAOs	2 years

5.0 COMPARISON AND EVALUATION OF ALTERNATIVES

5.1 Evaluation Criteria

Ohio EPA considers eight (8) criteria, as outlined in the NCP, to evaluate the various remedial alternatives individually and compare them with each other in order to select a remedy. A more detailed analysis of the remedial alternatives can be found in the FS report. The eight (8) evaluation criteria, including the threshold, balancing and modifying criteria are shown below in **Table 5, Remedial Alternative Evaluation Criteria**.

TABLE 5 REMEDIAL ALTERNATIVE EVALUATION CRITERIA
Threshold Criteria (2)
Overall Protection of Public Health and the Environment - determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, treatment, etc.
Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) - evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

Balancing Criteria (5)
Long-Term Effectiveness and Permanence – evaluates the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume of Contaminants Through Treatment – evaluates the amount of contamination present, the ability of the contamination to move in the environment, and the use of treatment to reduce harmful effects of the principal contaminants.
Short-Term Effectiveness – evaluates the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
Implementability – evaluates the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Cost – includes estimated capital and annual operation and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
Modifying Criterion (1)
Community Acceptance – considers whether the local community agrees with Ohio EPA's analyses and preferred alternative. Comments received on the Preferred Plan are an important indicator of community acceptance.

Evaluation Criteria 1 and 2 are threshold criteria required for acceptance of an alternative. Any acceptable remedy must comply with both of these criteria. Evaluation Criteria 3 through 7 are the balancing criteria used to select the best remedial alternative(s) identified in the Preferred Plan. Evaluation Criteria 8, community acceptance, is evaluated through public comment on the alternatives received during the comment period.

5.2 Analysis of Evaluation Criteria

This section examines how each of the evaluation criteria is applied to each of the remedial alternatives listed in Section 4.0 and compares how the alternatives achieve the evaluation criteria.

Overall Protection of Human Health and the Environment

Evaluation of the overall protectiveness of the alternatives focuses on whether each alternative achieves adequate protection of human health and the environment and identifies how site risks posed through each pathway being addressed are eliminated, reduced or controlled by the alternative. This evaluation also includes consideration of whether the alternative poses any unacceptable short-term or cross-media impacts.

Soil Alternatives: Alternative S1 does not attempt to restrict contact with contaminated soils and therefore is not protective of human health and the environment. Alternative S2 is partially protective through implementation of an EC, which would eliminate direct contact with soils above the minimum applicable POCs. Alternative S3 fully complies with

this criterion since it requires an EC and remediation of the COPR AOC, through either removal, to a Site-specific risk-based hexavalent chromium concentration of 467 mg/kg or capping, both of which are protective of the child resident receptor.

Ground Water Alternatives: The same ground water alternative (G2) is proposed for use with each of the soil alternatives. The restriction of ground water use and restricting constructions in areas of the OU with potential impacts to indoor air from volatile contaminants in ground water through an EC is protective of human health.

Compliance with ARARs

Soil Alternatives: Alternative S1 does not comply with ARARs because it does not address current or future risks to human health and the environment. Alternative S2 does not fully comply with ARARs because, although it does require the establishment of and EC and RMP, it fails to address potential upward migration of hexavalent chromium into the applicable minimum POC, which could cause an exceedance of risk-based standards in the future. S3 fully complies with ARARs identified for OU15. The intent of the proposed cap is to prevent upward migration of hexavalent chromium into the minimum applicable 2' POC, thus satisfying relevant and appropriate requirements. S3 also meets the risk-based standards applied to the Site (cancer risk of 1E-5 and non-cancer risk (HI) of 1. The EC would be established in compliance with Ohio Revised Code (ORC) §§ 5301.80 through 5301.92.

Ground Water Alternatives: The ground water alternative (G2) also complies with the ARARs identified for OU15. Under the alternative, use of ground water would be restricted for potable and non-potable use, with the exception of environmental investigations, through an EC. The EC would be established in compliance with Ohio Revised Code (ORC) §§ 5301.80 through 5301.92.

Because the "no action alternatives" do not meet the two threshold criteria (overall protection of human health and the environment, and compliance with ARARs), they were eliminated from consideration under the remaining criteria.

Long-Term Effectiveness and Permanence

Soil Alternatives: Alternative S2 meets the requirements of long-term effectiveness and permanence due to the EC and RMP which would be established for the OU, but it does not address the potential for upward migration of hexavalent chromium into the applicable minimum POC. Alternative S3 fully meets the criterion of long-term effectiveness and permanence, since it addresses the establishment of an EC and RMP, in addition to remediating the COPR area through either removal or capping.

Ground Water Alternatives: The ground water alternative (G2) meets the long-term effectiveness and permanence criteria by restricting ground water usage through an EC. In addition, ground water yield and quality across the Site are low, limiting use for potable purposes and further solidifying the permanence of this alternative.

Reduction of Toxicity, Mobility or Volume by Treatment

Soil Alternatives: Alternative S2 does not result in a reduction of toxicity, mobility or volume by treatment. Alternative S3 will result in a reduction of mobility, if in-place capping

is used, since the material placed over the COPR will prevent upward mobility of the material through wicking processes.
Ground Water Alternatives: The ground water alternative (G2) does not result in a reduction of toxicity, mobility or volume by treatment, since it relies strictly on an EC to restrict ground water use.

Short-Term Effectiveness

Soil Alternatives: Alternatives S2 and S3 would become immediately effective upon recording of the EC. Additional remediation prescribed by Alternative S3 will take additional time to implement and could result in potential short term releases during implementation of this remedy.
Ground Water Alternatives: The ground water alternative (G2) would become effective immediately upon recording the EC.

Implementability

Soil Alternatives: Minimal obstacles to implementability exist for Alternatives S2 and S3. The current property owner is in agreement with placing an EC on OU15 to restrict use. They have placed ECs on other OUs within the Diamond Shamrock Painesville Works Site without difficulty. In addition, delineation, capping, excavation and transport of COPR within the Site, as would be required under Alternative S3, have already been performed without incident. The required permits to transport soils and wastes to and from the Site via public roadways has been obtained by the developer. If the COPR area is excavated and disposed off-site at a licensed disposal facility, TCLP sampling may be necessary. A site-wide storm water pollution prevention plan (SWPPP) is in place.
Ground Water Alternatives: Minimal obstacles also exist for implementation of the ground water alternative (G2). As stated above, the owner is in agreement with placing an EC on OU15, and has done so without difficulty in the past.

Cost

Soil Alternatives: The estimated present worth cost of Alternative S2 is less than that of Alternative S3. However, Alternative S2 does not provide the long-term permanence of Alternative S3, due to the addition of remedial activities in the COPR AOC. This long-term protection of human health and the environment warrants the additional expenditures associated with Alternative S3.
Ground Water Alternatives: The estimated present worth cost of the ground water alternative (G2) is incorporated into both Alternatives S2 and S3, since the ground water use limitations will be incorporated into the EC already required under both soil alternatives.

Community Acceptance

Ohio EPA received comments from interested parties at the public meeting held on July 31, 2008, at the Painesville Township Hall and during the public comment period, which ran between June 26, 2008 and August 8, 2008. Those comments and Ohio EPA's responses are included in Section 8.0, Responsiveness Summary, of this Decision Document.

5.3 Summary of Evaluation Criteria

A summary of the evaluation of the OU15 remedial alternatives is included in **Table 6 Evaluation of OU15 Remedial Alternatives**.

TABLE 6 EVALUATION OF OU15 REMEDIAL ALTERNATIVES

Remedial Alternatives	Threshold Criteria		Balancing Criteria					Modifying Criteria
	1. Protects Human Health & Environment	2. Compliance with ARARs	3. Long Term Effectiveness	4. Reduces T, M and/or V by Treatment	5. Short Term Effectiveness	6. Implementable	7. Costs	8. Community Acceptance
Soil								
S1 (ALT OU15-A) "No Action"	□	□	□	□	□	□	□	□
S2 (ALT OU15-B)	◘	◘	◘	□	■	■	■	■
S3 (ALT OU15-C)	■	■	■	■	■	■	■	■
Ground Water								
G1	□	□	□	□	□	□	□	□
G2	■	■	■	□	■	■	■	■

■ = Fully Meets Criteria ◘ = Partially Meets Criteria □ = Does Not Meet Criteria

6.0 OHIO EPA'S SELECTED ALTERNATIVE

Ohio EPA's selected remedial alternative for OU15 of the Diamond Shamrock Painesville Works Site is a combination of Soil Alternative S3 (ALT OU15-C), and Ground Water Alternative G2.

Based on information presently available, it is Ohio EPA's current judgment that the selected remedial alternative best satisfies the criteria defined in Table 6, Evaluation of OU15 Remedial Alternatives. The elements of the selected remedial alternative are as follows:

- Further delineation and remediation of the COPR area of concern (AOC) (see Figure 5) through either: (1) removal of the COPR and disposal in pre-constructed cells within OU16 (see Figure 1)[5]; (2) removal of the COPR and disposal off-Site at a licensed solid waste or hazardous waste landfill, as appropriate; or (3) covering any portions of the AOC that exceed the Site-

[5] Placement of COPR into pre-designed disposal cells within OU16 would be authorized through the RD/RA Order.

specific risk-based remedial goal (RBRG) for hexavalent chromium for the child resident receptor of 467 mg/kg (see Section 3.0), with an engineered cap, consisting of a 12" base layer of compacted clay, geotextile, 40 ml geomembrane and another 12" of compacted clay, to prevent the upward wicking of hexavalent chromium from the COPR AOC.

Performance Standards:

- Options 1 & 2
  - The performance standard is met when COPR-contaminated soil (see Figure 5), delineated as part of future Ohio EPA-approved RA activities, have been removed and confirmatory sample analyses demonstrate that the remaining soil meets the acceptable levels referenced in the soil RAOs (*i.e.,* 467 mg/kg for hexavalent chromium) in Section 3.0.

  - The performance standard is met when confirmatory sampling, performed immediately following soil removal activities per an Ohio EPA-approved RA work plan, documents the presence of the applicable minimum POC (2' in commercial/recreational and 4' in residential use areas), including levels of hexavalent chromium below the acceptable soil RAO of 467 mg/kg (see Section 3.0), and passes an Ohio EPA inspection.

- Option 3
  - The performance standard is met when an engineered cap and liner system is placed over COPR-contaminated soil (see Figure 5) delineated as part of the Ohio EPA-approved RA activities, per an Ohio EPA-approved work plan, and passes an Ohio EPA inspection.

- Establishment of an Environmental Covenant (EC) which would:

1. Prohibit residential development on portions of OU15 which do not meet residential risk-based standards, and restrict those portions to recreational use with the applicable 2' minimum POC (see Figure 4);

2. Require establishment of a 4' minimum POC in those portions of OU15 designated for residential use (see Figure 4);

3. Prohibit excavation below the applicable minimum 2' POC in the areas of OU15 designated as recreational use and below the applicable minimum 4' POC in the areas of OU15 designated as residential land use (see Figure 4);

4. Prohibit construction of habitable structures at specific locations within OU15 where unacceptable risk exists to human health due to volatilization of contaminants to indoor air (see Figure 4);

5. Prohibit the construction of sub-grade habitable structures (i.e., basements and/or crawl spaces) across the entirety of OU15;

6. Prohibit the extraction of ground water for potable or non-potable use within OU15, with the exception of environmental investigation, remediation, and monitoring;

7. Prohibit any excavation in the area (see Figure 5) covered by an engineered cap and liner system installed as part of COPR-remediation activities (as appropriate).

8. Prohibit all excavation by construction workers unless the excavation is performed in accordance with an Ohio EPA approved risk management plan (RMP).

Performance Standards:

- The performance standard is met when documentation that the environmental covenant, including the restrictions identified in Section 6.0, has been recorded in the Lake County Recorder's Office is provided to Ohio EPA.

- The performance standard is met when the restrictions identified in the environmental covenant are continually enforced, such that the RAOs (see Section 3.0) for the various media are met, until such institutional controls are no longer necessary.

- The performance standard is met when the property owner submits annual reports describing compliance with the environmental covenant.

7.0 Documentation of Significant Changes

The preferred alternative presented in the Preferred Plan for OU15 included remediation of three (3) impacted areas along the top of the Lake Erie bluff. Impacted Areas DC-4, DC-5, and DC-6 contained levels of contaminants in soils above acceptable risk-based standards for residential use. Following issuance of the Preferred Plan for OU15: (1) the East Ohio Gas high pressure line was relocated away from the Lake Erie bluff; (2) the bluff was then re-graded to address erosion issues, which resulted in the removal of soils from Impacted Areas DC-4, DC-5 and DC-6; and (3) the Site developer revised the Site plan, which changed the end use of the northern portion of OU15 to commercial/recreational rather than residential. These activities eliminated the need for additional remediation of the three (3) impacted areas. Soils and Solvay material (calcium carbonate fines) from the slope grading work, which met residential use standards, were relocated to OU7 for use as fill.

In addition, Ohio EPA determined that it would be more appropriate to maintain the applicable minimum POCs across OU15 through an EC, rather than through an Operation and Maintenance (O&M) Agreement, as was proposed in the Preferred Plan for OU15. Under the EC, the property owner would be required to submit an annual report describing compliance with the environmental covenant, including POCs. Excavation below the applicable minimum POCs would be prohibited unless performed in accordance with an Ohio EPA-approved RMP, in order to protect workers and ensure appropriate management of contaminated soils, materials and ground water.

8.0 Responsiveness Summary

On July 31, 2008, Ohio EPA presented the Preferred Plan for OU3 and OU15 at a public information session and hearing at the Painesville Township Hall. Oral and written comments were accepted at this meeting and during the comment period which ran from June 26, 2008 through August 8, 2008.

No technical comments regarding the OU15 Preferred Plan were received during the public comment period. The two non-technical comments which applied to OU15 and the Diamond Shamrock Site in general are provided below:

Comment One:

> *"This was not a legal public hearing, because: information about OU3 and OU15 in the Local Public Document Rooms (LPDRs, in Morley Library and Fairport Library) was not kept up to date, and the required thirty day notice was not (?) given."*

Response:

> The OU3 and OU15 hearing was public noticed and carried out in accordance with Ohio's rules and regulations.
>
> - Copies of the OU3 and OU15 Preferred Plan documents were provided directly to staff in both Morley Library and Fairport Library by Ohio EPA prior to issuance of the public notice.
>
> - As required, Ohio EPA published a public notice at least 30 days prior to the public hearing. On June 30, 2008, a public notice appeared in The News Herald, which is the largest local newspaper of general circulation in the Painesville, Ohio area. This public notice announced the July 31, 2008 public information session and hearing and provided a brief Site history and summary of the preferred plans for both OU3 and OU15. The notice also was published in Ohio EPA's Weekly Review.

Comment Two:

> *"It is beyond our comprehension why anyone would build a home on the contaminated waste dump known as Diamond Shamrock. Will the Ohio EPA be held accountable for any and all health concerns that may occur if the plan is approved? Knowing the*

history of the Diamond Shamrock Site we believe the toxic truth needs to be known now and forever. In our opinion, the Ohio EPA has failed its mission to protect the health and safety of Middlefield Ohio residents (referencing the Middlefield contaminated toxic dumps) and we do not want this to happen again. Also, the moderator at the public hearing (limited public questions) at the question and answer segment at the July 31st meeting. Another illustration of the ineptitude of the Ohio EPA which was extremely improper."

Response:

- In order to fulfill requirements of the 1995 DFFOs and the 2005 Federal Judicial Consent Decree, the Painesville PRP Group, on behalf of all of the signatories to the 1995 Director's Final Findings and Orders (DFFOs), performed both baseline and post-remedy human health risk assessments. Under an approved Interim Action Work Plan (IAWP). Significant remediation took place on OU15 following approval of the Baseline Human Health Risk Assessment (BHHRA), including the removal of contaminated soil and placement of clean soils within the OU boundaries. However, in order to be protective of human health and the environment, the additional work outlined in this Decision Document is also required.

  Upon completion of remediation under a future Remedial Design/Remedial Action (RD/RA) Order, OU15 will meet residential and commercial/recreational standards. Compliance with these risk-based standards will rely, in part, on an Environmental Covenant (EC) to restrict land and ground water use, as well as maintain minimum points of compliance (POCs) across OU15. The EC will contain an annual reporting requirement to ensure that the minimum applicable POCs are maintained.

- Ohio EPA's Diamond Shamrock Site files are available for review at the Ohio EPA Northeast District Office in Twinsburg. Ohio EPA also maintains record repositories at the Morley Public Library in Painesville and the Fairport Harbor Public Library.

- The Diamond Shamrock Site is located in Painesville Township, the City of Painesville, and the Village of Fairport Harbor, entirely within Lake County, Ohio. The Site has no connection to Ohio EPA-regulated sites in Middlefield, Geauga County, Ohio.

- Citizens attending the July 31, 2008, public meeting were given the opportunity to ask questions and submit comments concerning the Preferred Plan. There were no limits placed on the volume of comments submitted to the Agency during the public comment period, which ended on August 8, 2008.

All written comments received during the public comment period are available for review at Ohio EPA's Northeast District Office, located at 2110 East Aurora Road, Twinsburg, Ohio, and at the Site's public document repositories, located at the Morley Public Library (184

Phelps St., Painesville, Ohio) and the Fairport Harbor Public Library (335 Vine St., Fairport Harbor, Ohio). A stenographic record of the public hearing portion of the meeting is attached.

Appendix A Glossary of Terms

Applicable or Relevant and Appropriate Requirements (ARARs): Those rules that strictly apply to remedial activities at the site or those rules whose requirements would help achieve the remedial goals for the site.
Baseline Risk Assessment: An evaluation of the risks to humans and the environment posed by a site in the absence of any remedial action, which also determines the extent of cleanup needed to reduce potential risk levels to within acceptable ranges.
Carcinogen: A chemical that causes cancer.
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq. A federal law that regulates cleanup of hazardous substances sites under the U.S. EPA Superfund Program.
Contaminants of Concern (COCs): Chemicals identified at the site that are present in concentrations that may be harmful to human health or the environment.
Decision Document: A statement issued by the Ohio EPA giving the director's selected remedy for a site and the reasons for its selection.
Ecological Receptor: Animals or plant life exposed or potentially exposed to chemicals released from a site.
Environmental Covenant: A servitude arising under an environmental response project that imposes activity and use limitations and that meets the requirements established in ORC Section 5301.82.
Exposure Pathway: Route by which a chemical is transported from the site to a human or ecological receptor.
Feasibility Study: A study conducted to ensure that appropriate remedial alternatives are developed and evaluated such that relevant information concerning the remedial action options can be presented to a decision-maker and an appropriate remedy can be selected.
Hazardous Substance: A chemical that may cause harm to humans or the environment.
Hazardous Waste: A waste product listed or defined by RCRA that may cause harm to humans or the environment.
Human Receptor: A person/population exposed to chemicals released at a site.
Imminent Threat: A high probability that exposure is occurring.
Monitoring Well: A well installed to collect ground water samples for the purpose of physical, chemical, or biological analyses to determine the amounts, types, and distribution of contaminants in ground water beneath a site.
NCP: National Oil and Hazardous Substances Pollution Contingency Plan, codified at 40 C.F.R. Part 300 (1990), as amended. A framework for remediation of hazardous substance sites specified in CERCLA.
Operation and maintenance (O&M): Long-term measures taken at a site, after the initial remedial actions, to assure that a remedy remains protective of human health and the environment.
Performance Standard: Measures by which Ohio EPA determines if RAOs are being met.

Preferred Plan: The plan that evaluates the preferred remedial alternative chosen by Ohio EPA to remediate the site in a manner that best satisfies the evaluation criteria.
Present Worth Cost: Estimated current cost, or value, of the future remedial costs to be expended, typically discounted at the current market rate. Provides a solid basis for comparing costs of each of the remedial alternatives.
RCRA: Resource Conservation and Recovery Act of 1976, as amended, 42 U.S.C. 6901 et seq. A federal law that regulates the handling of hazardous wastes.
Remedial Action Objectives: Specific remedial goals for reducing risks posed by the site.
Remedial Investigation: A study conducted to collect information necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives.
Responsiveness Summary: A summary of all comments received concerning the Preferred Plan and Ohio EPA's response to the comments.
Risk-based Remedial Goal: Final cleanup levels identified in the Decision Document along with the RAOs and performance standards
Sediment: Topsoil, sand and minerals washed from the land into water, usually after rain or snow melt.
Water Quality Criteria: Chemical, physical and biological standards that define whether a body of surface water is unacceptably contaminated. These standards are intended to ensure that a body of water is safe for fishing, swimming and as a drinking water source. These standards can be found in OAC Chapter 3745-1.

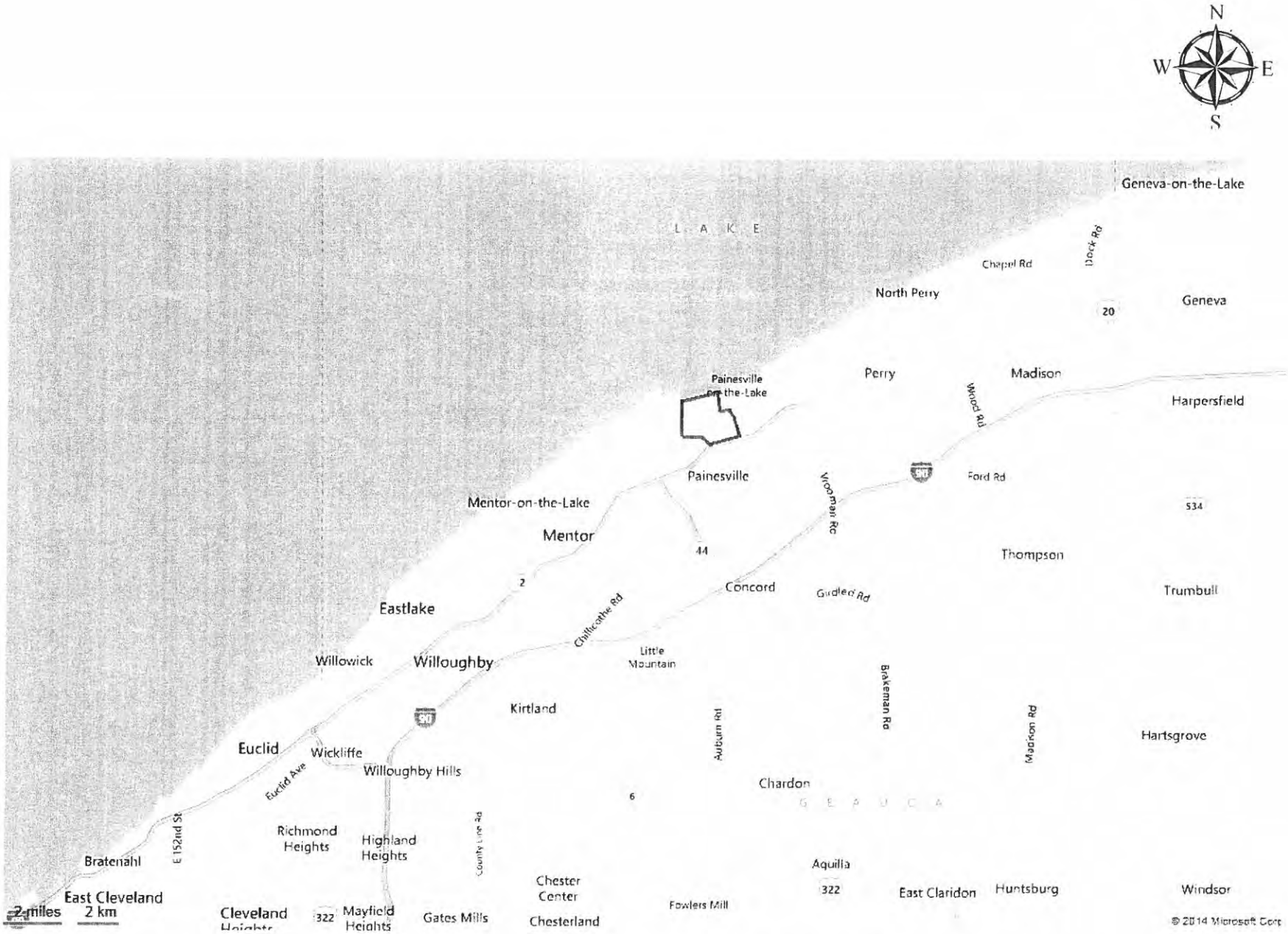
Appendix B Primary Contaminants of Concern

A total of five (5) primary contaminants of concern (COCs) have been identified that pose the greatest potential risk to human health and the environment at OU15. Additional details on each primary COC (from the Agency for Toxic Substances and Disease Registry (ATSDR Toxicological Profiles) are provided below.

Aluminum is the most abundant metal in the earth's crust. It is always found combined with other elements such as oxygen, silicon, and fluorine. Aluminum as the metal is obtained from aluminum-containing minerals. Small amounts of aluminum can be found dissolved in water. Aluminum is used for beverage cans, pots and pans, airplanes, siding and roofing, and foil. Aluminum is often mixed with small amounts of other metals to form aluminum alloys, which are stronger and harder. breathe large amounts of aluminum dusts can have lung problems, such as coughing or abnormal chest X-rays. Some workers who breathe aluminum dusts or aluminum fumes have decreased performance in some tests that measure functions of the nervous system. Some people with kidney disease store a lot of aluminum in their bodies and sometimes develop bone or brain diseases which may be caused by the excess aluminum. The Department of Health and Human Services (DHHS) and the EPA have not evaluated the carcinogenic potential of aluminum in humans. Aluminum has not been shown to cause cancer in animals.
Dieldrin is an insecticide, with a similar chemical structure to aldrin. Aldrin quickly breaks down to dieldrin in the body and in the environment. Pure aldrin and dieldrin are white powders with a mild chemical odor. The less pure commercial powders have a tan color. Neither substance occurs naturally in the environment From the 1950s until 1970, aldrin and dieldrin were widely used pesticides for crops like corn and cotton. Because of concerns about damage to the environment and potentially to human health, EPA banned all uses of aldrin and dieldrin in 1974, except to control termites. In 1987, EPA banned all uses.
Hexavalent Chromium compounds are a large group of chemicals with varying chemical properties, uses, and workplace exposures. Their properties include corrosion-resistance, durability, and hardness. Workers may be exposed to airborne hexavalent chromium when these compounds are manufactured from other forms of chromium (e.g., the production of chromates from chromite ore); when products containing hexavalent chromium are used to manufacture other products (e.g., chromate-containing paints, electroplating); or when products containing other forms of chromium are used in processes that result in the formation of hexavalent chromium as a by-product (e.g., welding). Hexavalent chromium is a well-established carcinogen associated with lung, nasal, and sinus cancer. Some of the industries in which the largest numbers of workers are exposed to high concentrations of airborne Cr(VI) compounds include electroplating, welding, and chromate painting. Dermal exposure to hexavalent chromium can cause skin irritation, corrosion, ulcers, sensitization, and allergic contact dermatitis.
Manganese is a naturally occurring metal that is found in many types of rocks. Pure manganese is silver-colored, but does not occur naturally. It combines with other substances such as oxygen, sulfur, or chlorine. Manganese occurs naturally in most foods, may be added to some foods, and is needed to stay healthy. Manganese is used principally in steel production to improve hardness, stiffness, and strength. It may also be used as an additive in gasoline to improve the octane rating of the gas. Exposure to excess levels of manganese may occur from breathing air, particularly where manganese is used in manufacturing, and from drinking water and eating food. At high levels, it can cause damage to the brain. Exposure to high levels of manganese in air can also cause lung irritation and reproductive effects. U.S. EPA has concluded that existing scientific information cannot determine whether or not excess manganese can cause cancer.

Vanadium is a compound that occurs in nature as a white-to-gray metal, and is often found as crystals. Pure vanadium has no smell. It usually combines with other elements such as oxygen, sodium, sulfur, or chloride. Vanadium and vanadium compounds can be found in the earth's crust and in rocks, some iron ores, and crude petroleum deposits. Vanadium is mostly combined with other metals to make special metal mixtures called alloys. Vanadium in the form of vanadium oxide is a component in special kinds of steel that is used for automobile parts, springs, and ball bearings. Most of the vanadium used in the United States is used to make steel. Vanadium oxide is a yellow-orange powder, dark-gray flakes, or yellow crystals. Vanadium is also mixed with iron to make important parts for aircraft engines. Small amounts of vanadium are used in making rubber, plastics, ceramics, and other chemicals. Excess levels of vanadium can affect the cardiovascular, gastrointestinal, renal, reproductive and respiratory systems. Exposure to vanadium does not appear to cause cancer.

FIGURE 1
Diamond Shamrock Site Map



DIAMOND SHAMROCK PAINESVILLE WORKS SITE – LAKE COUNTY, OHIO

(Map modified from Bing Maps, www.bing.com, 2014)

FIGURE 2
Operable Unit 15 Location Map

FEASIBILITY STUDY OPERABLE UNITS
(PARCEL GROUPINGS)

OU15 (B1, B2, 5B)

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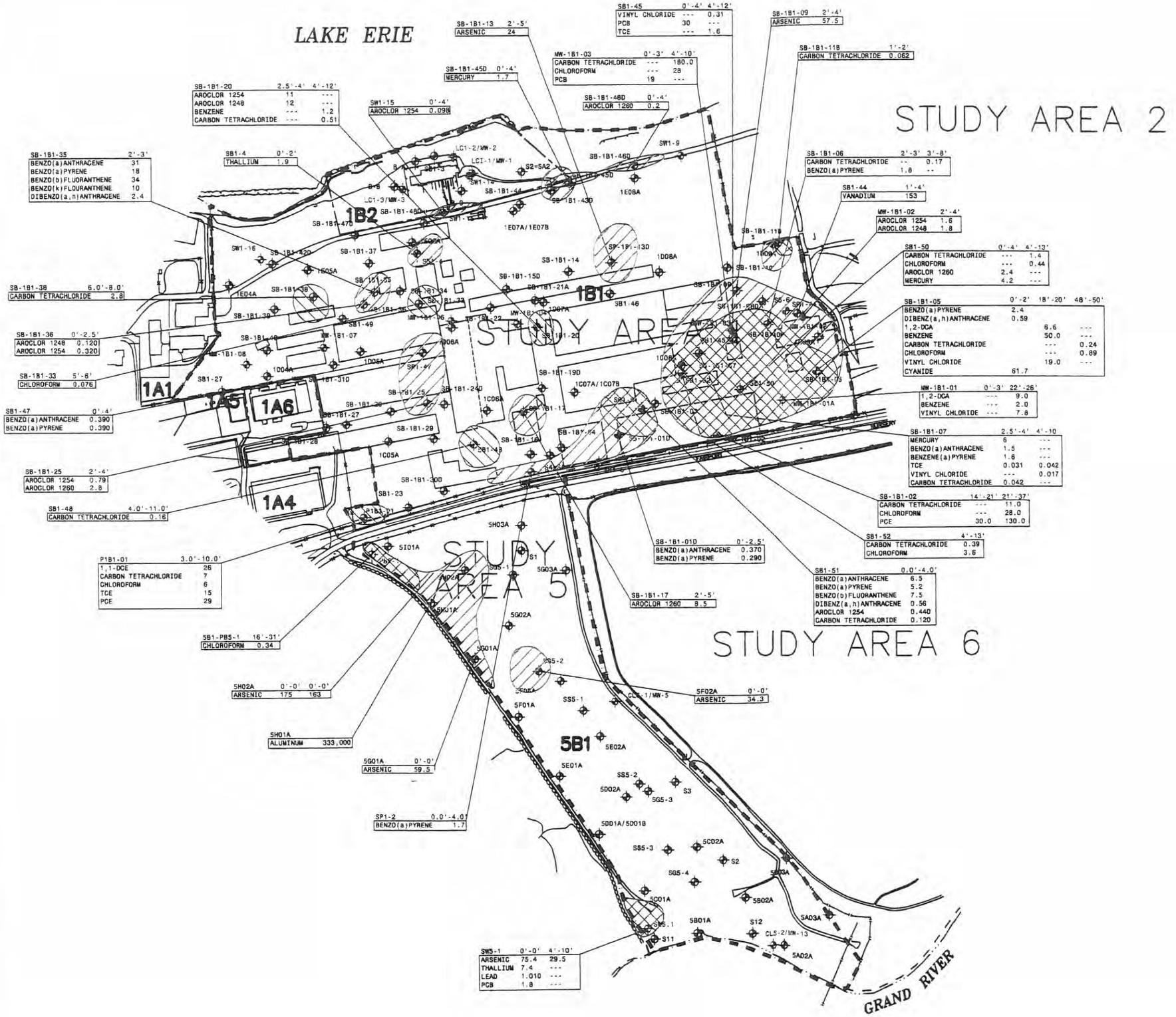
CONSTRUCTION CERTIFICATION REPORT

FIGURE 1-2
OPERABLE UNIT 15 LOCATION MAP

DIAMOND SHAMROCK PAINESVILLE WORKS SITE
PAINESVILLE, LAKE COUNTY, OHIO

PROJECT NO.: HEM085	SUBMITTAL DATE: JUNE 2007
CAD DWG FILE: HEM085.600.0023	PLOT DATE: 6/14/07

FIGURE 3
Operable Unit 15 Sampling Locations (Pre-Interim Action)



CONCENTRATIONS PRESENTED EITHER EXCEED THE HAZARD QUOTIENT OF ONE AND/OR CANCER RISK OF $1x10^{-5}$ OR SIGNIFICANTLY CONTRIBUTE TO THE CUMULATIVE RISK AND CAUSE AN OVERALL CUMULATIVE EXCEEDANCE OF THE HAZARD AND RISK GOALS.

RECREATIONAL RECEPTORS WERE NOT EVALUATED IN PARCELS 1B1 & 1B2, BUT THE EVALUATION OF ADULT AND CHILD RESIDENTS IS CONSIDERED PROTECTIVE OF RECREATIONAL RECEPTORS.

THE AREA SURROUNDING BORING SB1-4 IS BEING REMEDIATED DUE TO A DETECTION OF THALLIUM. ALTHOUGH THALLIUM WAS REMOVED FROM FURTHER CONSIDERATION DURING THE RI SCREENING PROCESS, THE AREA IS INCLUDED IN THE PLANS FOR THE INTERIM ACTION IN ANTICIPATION OF SEEKING A NFA DECISION IN ACCORDANCE WITH OAC 3745-300.

SOIL ANALYTICAL RESULTS PRESENTED HEREIN ARE PRE-REMEDY.

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REGISTERED ENGINEER

DATE

FEASIBILITY STUDY
OPERABLE UNIT 15

OWNER:

MARK	DATE	DESCRIPTION

PROJECT NO.:	TIED15
CAD DWG FILE:	TIED15.B09.0012
PLOT DATE:	7/16/07
LAYOUT BY:	
DRAWN BY:	
CHECKED BY:	WMB
SCALE:	1" = 200'
SUBMITTAL DATE:	JULY 2007

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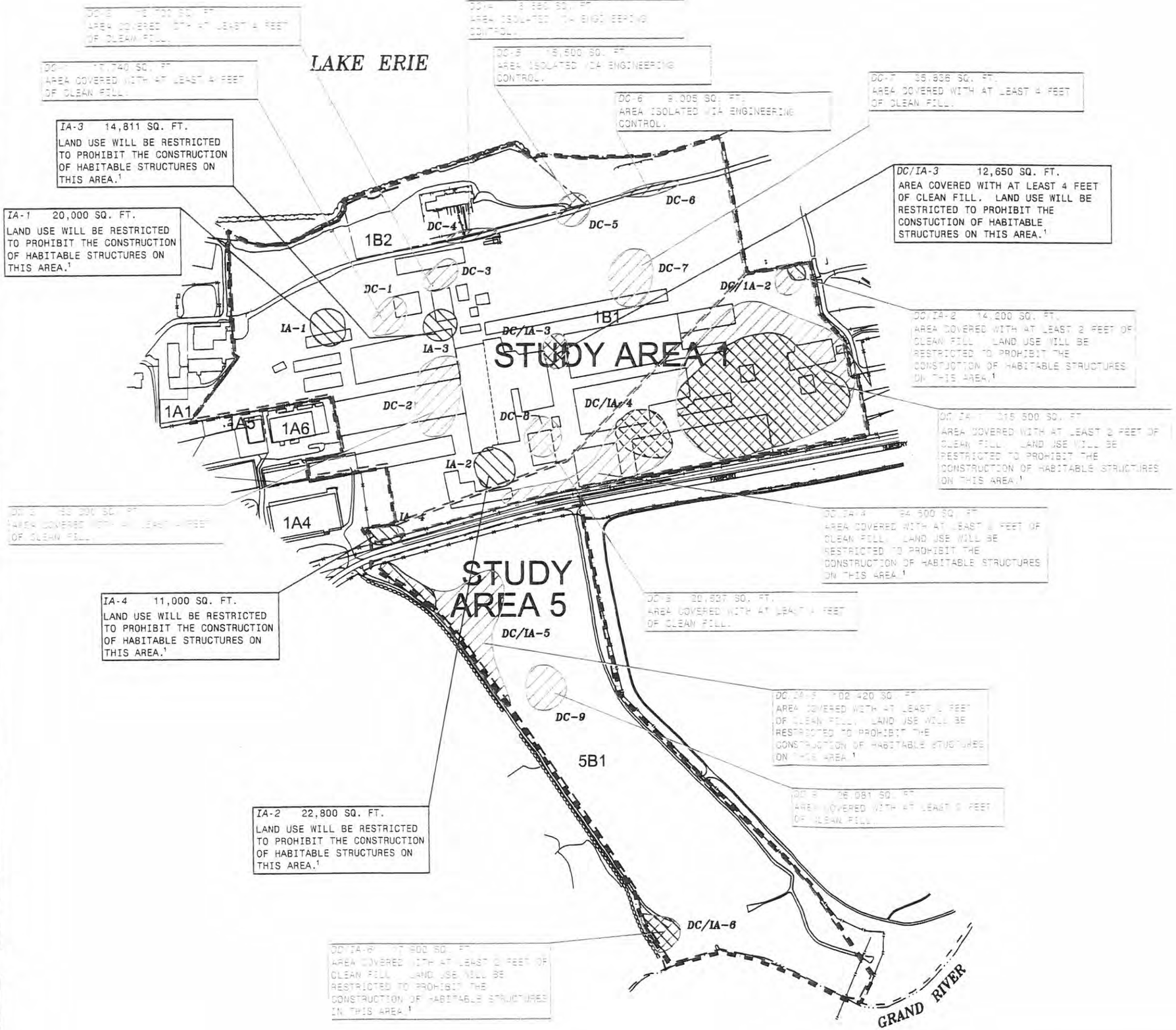
SHEET TITLE:

FIGURE 6
SAMPLE LOCATIONS AND SOIL ANALYTICAL SUMMARY (PRE-REMEDY)

OEPA CODE: TITLE

FIGURE 4
Soil/Indoor Air Areas of Concern and Remedy Locations (Post-Interim Action)



N

0 100 200 400

SCALE IN FEET

LEGEND

- PARCEL BOUNDARY
- PROPERTY LINE
- SOIL EXCEEDS RISK GOAL FOR RESIDENTIAL LAND USE
- SOIL EXCEEDS RISK GOAL FOR SOIL VOLATILIZATION TO INDOOR AIR
- SOIL EXCEEDS RISK GOAL FOR RECREATIONAL LAND USE

IA = INDOOR AIR SCREENING LEVELS EXCEEDED

DC = DIRECT CONTACT STANDARDS EXCEEDED

LAND USE UNITS

- LAND USE UNIT 1B1/1B2 RESIDENTIAL
- LAND USE UNIT 1B1 RECREATIONAL
- LAND USE UNIT 5B1 RECREATIONAL

NOTES:
1 UNLESS OHIO-EPA APPROVED ENGINEERING CONTROLS ARE PUT INTO PLACE TO REDUCE RISK TO ACCEPTABLE LEVELS.

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REGISTERED ENGINEER

DATE

LAKEVIEW BLUFFS CLEAN OHIO REVITALIZATION FUND CONSTRUCTION CERTIFICATION REPORT OPERABLE UNIT 15

OWNER:

MARK	DATE	DESCRIPTION

PROJECT NO.: TIE001
CAD DWG FILE: TIE001.800.0082
PLOT DATE: 8/14/07
LAYOUT BY:
DRAWN BY:
CHECKED BY: MRB
SCALE: 1" = 200'
SUBMITTAL DATE: JUNE 2007

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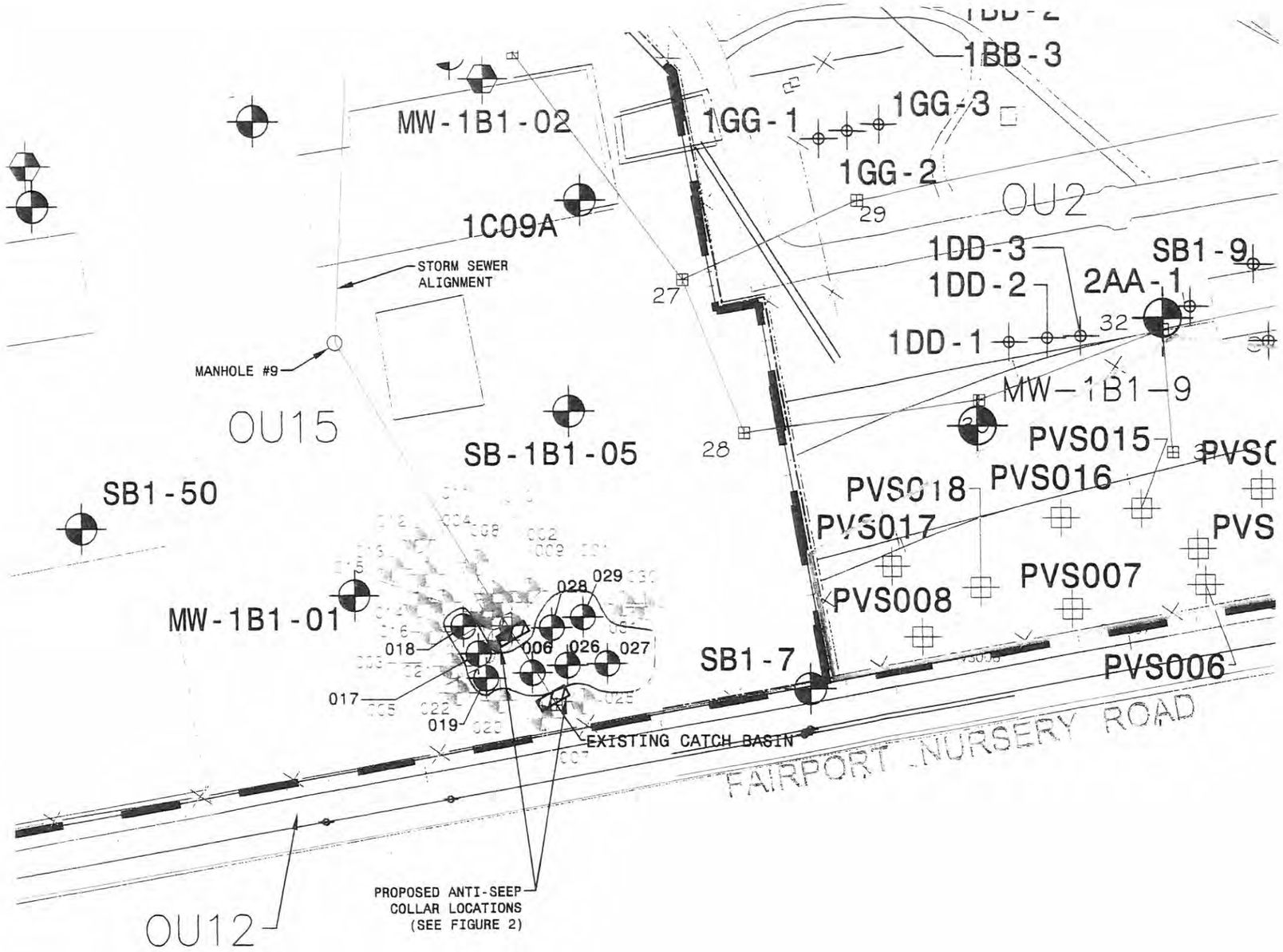
SHEET TITLE:

FIGURE 2-2
REMEDY SUMMARY

OEPA CODE: TITLE

SHEET OF

FIGURE 5
Chromite Ore Processing Residue (COPR) Area of Concern



N

LEGEND

- MONITORING WELL (PHASE I/PHASE II REMEDIAL INV.)
- SOIL BORING (PHASE I/PHASE II REMEDIAL INV.)
- SOIL BORING (2003)
- SOIL BORING (2005)
- LIMITS OF OU2 CAP OVER Cr^{+6} IMPACTED SOILS
- SOIL BORING (2007)
- SOIL SAMPLE (2007) EXCEEDING RISK BASED REMEDIATION GOAL FOR HEXAVALENT CHROMIUM, RECREATIONAL LAND USE (467 mg/kg)
- STORM SEWER ALIGNMENT AND CATCH BASIN (PROPOSED)
- EXTENT OF Cr^{+6} IN SOIL EXCEEDING RBRG FOR RECREATIONAL LAND USE (467 mg/kg) DASHED WHERE INFERRED

THIS FIGURE IS BASED ON INFORMATION PRESENTED IN PHASE II REMEDIAL INVESTIGATION REPORT OF THE PAINESVILLE WORKS SITE PAINESVILLE OHIO, FIGURE 3-1, RI SAMPLE LOCATION MAP (JUNE 2003, SECOR INTERNATIONAL, INCORPORATED)

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CHROME IN SOIL DELINEATION (OU15)

FIGURE 1
OU15 BORING LOCATIONS (2007)

FORMER DIAMOND SHAMROCK PAINESVILLE WORKS SITE
PAINESVILLE, LAKE COUNTY, OHIO

PROJECT NO.: TIE015	SUBMITTAL DATE: OCTOBER 2007
CAD DWG FILE: TIE015.600.0017	PLOT DATE: 10/1/07

OHIO ENVIRONMENTAL PROTECTION AGENCY
PUBLIC HEARING

- - - - - - - - - - - - - - - - - - - -:
:
In Re: :
:
Draft Preferred Plans for :
Cleanup Operable Units 3 and 15 :
Diamond Shamrock Painesville Works :
:
- - - - - - - - - - - - - - - - - - - -:

Transcript of proceedings before the Ohio Environmental Protection Agency, taken at Painesville Town Hall, 55 Nye Road, Painesville, Ohio 44077, on Thursday, July 31, 2008, commencing at 6:30 p.m.

APPEARANCES:

Darla Peelle, Ohio EPA Public Involvement Coordinator

Teri Heer, Ohio EPA, Site Coordinator

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OHIO EPA NEDO

MS. PEELLE: The purpose of this public hearing is to accept comments on the official record regarding two draft plans to clean up operable units 3 and 15 -- two of 24 operable units or parcels comprising of the 1,100-acre Diamond Shamrock property in Painesville, Ohio.

Operable Unit 3 is a 25-acre parcel on the northeast corner of the property and is adjacent to Lake Erie. Sampling throughout the parcel found high concentrations of polycyclic aromatic hydrocarbons, also known as PAHs, in one location. Ohio EPA's preferred cleanup plan calls for removing these contaminated soils, covering with clean soils to prevent direct contact and restricting future use of the portions of Operable Unit 3.

Operating Unit 15 is a 100-acre parcel located in the center the property and borders the Grand River and Lake Erie. An earlier cleanup removed soils contaminated with metals, volatile organic compounds and semi volatile organic compounds; however, two areas of contaminated soils remain. Ohio EPA's

preferred plan proposes to excavate contaminated soils, replace with clean soils and place restrictions on future use.

Written and oral comments received as a part of the official record are reviewed by Ohio EPA prior to a final action of the Director. To be included in the official record, written comments must be received by Ohio EPA by the close of business on August 8, 2008. Comments received after this date will not be considered as part of the official record for this hearing but may be reviewed as the opportunity arises.

Written comments can be filed with us this evening or submitted to Teri Heer, Site Coordinator, Ohio EPA's Northwest District office -- I'm sorry, Northeast -- 2110 East Aurora Road, Twinsburg, Ohio 44087 or by e-mail. This information also can be found in the agenda and in the presentation.

It is important for you to know that all comments, whether received this evening or provided in writing are given the same consideration.

I ask that all exhibits referred to in

your testimony be submitted to us this evening as part of the official record. This will help us ensure the accuracy of your testimony.

Questions and comments made at the public hearing will be responded to in a responsiveness summary. The Director, after taking into consideration the recommendations of the program staff and comments presented by the public, may issue or deny these plans. Once a final decision is made by the Director, the decision, along with the responsiveness summary, will be sent to the applicant, all persons who have submitted comments and all persons who have signed in for this evening's meeting.

Final actions of the Director are appealable to the Environmental Review Appeals commission also known as ERAC; the board is separate from Ohio EPA and reviews cases in accordance with Ohio's environmental laws and rules. Any ERAC decision is appealable to the Franklin County Court of Appeals. Any order of the Court of Appeals is appealable to the Supreme Court of Ohio.

This evening, each individual may

testify only once and speak for five minutes. Ohio EPA representatives cannot respond to comments or questions during the hearing; hearings afford citizens an opportunity to provide input. An Ohio EPA representative may ask clarifying questions of speakers to ensure that the record is as complete as possible.

If you have a question that was not asked or responded to during the information session, please ask it on the record and it will be addressed in writing in the responsiveness summary.

Because of the size of the attendance this evening, rather than fill out cards, I'm going to ask that if you wish to provide testimony, raise your hand. I will call upon you; when you are recognized, if you will stand toward the front of the room for the stenographer's benefit, state your name, spell it for the record and then proceed with your testimony.

Does anyone wish to provide testimony?

MR. BIMBER: I have a draft version of my comments. I wish to send you a final version later by e-mail.

MS. PEELLE: If you could state and spell your name, sir.

MR. BIMBER: Sure. I'm Russell M. Bimber.

MS. PEELLE: Spell your last name, Mr. Bimber.

MR. BIMBER: B-i-m-b-e-r.

MS. PEELLE: Thank you.

MR. BIMBER: A couple of pages from the back of my testimony, I have attached, on this draft version an e-mail I sent to a few people to try to encourage attendance here.

I was a research chemist for Diamond Alkali and successor companies, Diamond Shamrock, SDS Biotech, and Ricerca for 40 years starting in 1952. I now live at 156 Kendal Drive, Oberlin, Ohio -- that's Kendal in Oberlin. My e-mail address is randcbim@juno.com My phone number is (440) 774-6175.

First, I would like to inform you that they have copies of the DSCRT newsletters here. The official document room on the third-floor of Morley Public Library did not

have issues 11 and 12 of that newsletter and they did not even have a copy of the public notice of this meeting. And as I understand it, it is required that you provide the public notice, published in the local newspapers, 30 days in advance of any public meeting. I do not believe this was done. The public document room did not even have a copy of a July 18th news release, which I found with Mike Settles' name on it on the Ohio EPA web site, and it was dated, July 18th. If it was placed in any newspapers, it was probably some time on or after that date, so it would seem as though it is too early to be holding this meeting. But anyway, I expect we will proceed anyway.

If a legal notice was published, I should have received a mailed copy because I've repeatedly signed up to get any EPA notices concerning Diamond, and I have had significant involvement with the EPA's litigation of Diamond for more than a decade, this included the 1998 appeal of the Ohio EPA Director's Final Findings and Orders, DFFO, on the Painesville Works, that's Case Number EBR

43392, that stands for Environmental Board of Review, which was before renaming to the Environmental Review Appeals Commission, ERAC, which they now use.

EBR Number 433921, that appeal was dismissed as being too late because I waited for the Director's Final Findings and Orders to appear in the local public document room and I had to keep insisting to Teri that it be placed there, for a long time before I achieved the placement in the local public repositories. After that time, I think I should have been allowed time from that date, but I wasn't. I was too late. I mailed in testimony on Operable Unit 6 for a public hearing on July 7, 2005, which I could not attend and, even though I was not a member of the DSCRT, I've attended several of their meetings, even after moving at Oberlin. That's about 140 miles west -- excuse me 70, 140 round-trip.

The Diamond Shamrock Community Relations Team Newsletter 12, citing this meeting, was mailed to me postmarked July 11, afternoon. The DSCRT web site, at that time,

had been completely revised and updated by the time I got the newsletter. Now it includes newsletter 12, Summer of 2008. Newsletter 11, Fall of 2007, which I did not get, minutes of DSCRT meetings and other interesting information.

I checked the web site during the week ended June 28, and it had not been updated since November, 2006.

Today, I checked Ohio EPA's web site and found an EPA news release about this meeting, dated July 18. Isn't a 30-day notice still required for public meetings?

Second. I think it is not proper to consider Operable Unit 3, which surrounds Operable Unit 10 on three sides, apart from Operable Unit 10, because of the large amount of toxic waste buried in Operable Unit 10.

Over 3,000,000 pounds of hazardous chemicals, including more than 100,000 gallons of Persistent Bio-accumulative, and Toxic liquids in tanks of 10 to 18,000 gallons were buried in Operable Unit 10. The chlorinated solvents in these tanks are much denser than water, well above the Lake and so close, they

could get into Lake Erie very quickly, perhaps moving through Operable Units 3 or 6.

This process could be analogous to the horizontal flow of large wedge shaped pieces of earth, both east and west of Operable Unit 10 that were flushed into Lake Erie more than a decade ago when water from melting snow on the top of the bluff was temporarily dammed by ice frozen on the north face of the bluff then broke loose. This left a lot of fine clay on top of the ice on the lake hundreds of feet from shore and a temporary sandy gravel beach 10 to 25 feet wide, which a friend and I both walked on. It was a very long length of sandy gravel beach.

MS. PEELLE: You have one minute Mr. Bimber.

MR. BIMBER: Sure.

MS. PEELLE: Thank you.

You have one minute.

MR. BIMBER: Okay. All right.

I better skip on then. The last couple of pages I mention some references that could be useful to some of these other people here.

The important thing I wanted to say is

I believe it is still possible to recover about 100,000 gallons of hazardous chlorinated solvents from Operable Unit 10 simply by pumping out whatever liquids remain in about 10 large tanks. If this were done, it would make the other hazardous wastes there, which might otherwise not be likely to migrate, much safer.

The Persistent Bio-accumulative Toxic liquids in large tanks were impure chlorinated solvents; carbon tetrachloride, usually called Carbon Tet, hexachlorobenzene, known also as HCB, dissolved in Hexachlorobutadiene, HCBD. These and the chlorinated paraffins and chlorothalonil fungicide, which are major contaminants in this OP OU 10, are all known or suspected human carcinogens, in addition to damaging the liver and kidneys and showing other toxic properties.

The exact nature of these wastes was detailed extensively in a letter from John Licata of Diamond Shamrock to Ohio EPA in 1981 and then ODNR protested the existence of so many hazardous waste so close to the edge of the Lake in 1982 and that's what led to the

Woodward Kline study of 1986. These documents are all contained in Ohio EPA's Twinsburg headquarters. People who want to view these documents have to make an appointment to go there and see them.

Portions of some of this information that is most important, may be available, sort of hidden in these extensive documents, in the local public document rooms. But if you make an appointment to view certain records and can identify what record you want to see, Ohio EPA will dig them out and you can go there to view them and copy what you need.

Thank you.

MS. PEELLE: Thank you, Mr. Bimber.

Would someone else like to provide testimony?

My son-in-law us an auctioneer and I usually say going once, going twice. All right. If there are no further requests to present testimony we will end the hearing.

Remember that written comments will be accepted through the close of business on August 8, 2008. Again, these can be sent to

Teri Heer listed at the address on the agenda.

Thank you for participating in Ohio EPA's decision-making process. It was good to see all of you here this evening. The time is now 7:32 and this hearing is adjourned. Thank you.

(Hearing concluded.)

- - -

State of Ohio,)
) SS:
County of Cuyahoga.)

C E R T I F I C A T E

This certifies that the foregoing is a true and correct transcript of the proceedings had before the State of Ohio, Environmental Protection Agency, at the Painesville Township Hall, on Thursday, July 31, 2008, commencing at 6:30 p.m.

In Re:

Diamond Shamrock Draft Preferred Plans
To Clean up Operable Units 3 and 15

COURT REPORTER

FINCUN-MANCINI COURT REPORTERS
1801 East Ninth Street
Suite 1720
Cleveland, Ohio 44114
(216) 696-2272
(216) 696-2275 FAX

PUBLIC NOTICE
Ohio EPA Final Decision Document

On July 21, 2015 the Ohio Environmental Protection Agency (Ohio EPA) finalized a Decision Document identifying the selected alternative to remediate contamination at Operable Unit 15 of the Diamond Shamrock Painesville Works Site, located at 1897 Fairport Nursery Road, Painesville Township, Lake County, Ohio. A copy of the Ohio EPA's Decision Document to remediate the operable unit and related documents are available at the Ohio EPA Northeast District Office, 2110 E. Aurora Road, Twinsburg, Ohio 44081. The complete public notice including instructions for requesting information or appealing this final action may be obtained at: http://www.epa.state.oh.us/Actions.aspx or: Hearing Clerk, Ohio EPA, PO Box 1049, 50 W. Town St. Columbus, Ohio 43216. Ph.: 614-644-2129 email: HClerk@epa.state.oh.us.

Decision Document Narrative for Weekly Review and EPA Web Page

Lake County

PUBLIC NOTICE
Ohio EPA Finalizes Decision Document

On July 21, 2015 the Ohio Environmental Protection Agency (Ohio EPA) finalized a Decision Document identifying the selected alternative to remediate contamination at Operable Unit 15 (OU15) of the Diamond Shamrock Painesville Works Site ("Site") located on Fairport Nursery Road, Painesville Township, Lake County, Ohio. OU15 is one of 24 operable units which make up the approximately 1100-acre former chemical manufacturing facility. Activities within OU15 included the manufacturing of soda products, chlorinated chemicals and acids, generation of electricity, and solution mining of salt. Contaminants within OU15 include aluminum, dieldrin, hexavalent chromium, manganese and vanadium. The selected alternative includes: delineation and removal or capping of an area contaminated with hexavalent chromium; restricting ground water use, construction of basements and crawl spaces, and excavation in the area contaminated with hexavalent chromium; requiring anyone performing excavations to follow an Ohio EPA-approved risk management plan, requiring a minimum of 2' of clean soil at the surface in areas used for commercial or recreational purposes and a minimum of 4' of clean soil at the surface in residential areas, and prohibiting construction of buildings in certain areas.

In May 2008, Ohio EPA issued a Preferred Plan that outlined Ohio EPA's preferred alternative to remediate contamination at the Site. A public meeting was held on July 31, 2008, during which public comments on the Preferred Plan were accepted. In addition, written comments on the Preferred Plan were accepted through August 8, 2008. The comments received by the Agency during the comment period are addressed in the Responsiveness Summary included in the Decision Document.

The effective date of this final action is July 21, 2015. You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of $70.00 made payable to "Ohio Treasurer," which the Commission, in its discretion, may reduce if by affidavit it is demonstrated that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office,

Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the Environmental Review Appeals Commission, 77 South High Street, 17th Floor, Columbus, Ohio 43215.

A copy of the Decision Document has been provided to the Morley Library, located at 184 Phelps Street, Painesville, and Fairport Public Library, located at 335 Vine Street, Fairport Harbor. The Decision Document and related materials are available for review at Ohio EPA's northeast district office, located at 2110 East Aurora Road, Twinsburg, by calling (330) 963-1200 to set up an appointment.