SECOND EXPLANATION OF SIGNIFICANT DIFFERENCES
for the
OCCIDENTAL CHEMICAL SUPERFUND SITE
Operable Unit 2 – Earthen Lagoons Remedy

Site Name:	Occidental Chemical Superfund Site
Site Location:	Lower Pottsgrove Township, Montgomery County, Pennsylvania
Lead Agency:	U.S. Environmental Protection Agency, Region III
Support Agency:	Pennsylvania Department of Environmental Protection ("PADEP")

I. INTRODUCTION

The United States Environmental Protection Agency ("EPA") has issued this Explanation of Significant Difference ("ESD") to explain modifications to the remedy selected in EPA's Record of Decision ("ROD") dated June 30, 1993, and the 1995 ESD, for the Occidental Chemical Corporation Superfund Site ("Site") in Lower Pottsgrove Township, Montgomery County, Pennsylvania. This ESD explains changes to the particular remedy selected in the ROD for Operable Unit 2 ("OU-2") at the Site. OU-2 consists of four (4) inactive earthen lagoons containing approximately 38,000 cubic yards of polyvinyl chloride ("PVC") material, which is a waste by-product of a facility that used to manufacture PVC resins at the Site. OU2 also includes an area in the floodplain, outside of the lagoon area, where PVC material was discovered in 2006 during the focused feasibility study ("FFS") performed by Occidental Chemical Corporation ("OxyChem"). EPA has determined that the PVC material in the lagoons, as well as coal fines (i.e., coal particulates) and soils at the bottom of the lagoons, contain elevated levels of vinyl chloride and other hazardous substances. As explained more fully below, the remedy for OU-2 originally involved the recycling, treatment, and on-Site landfill disposal of the earthen lagoons' contents. With this ESD, EPA is selecting off-Site disposal of all contents of the earthen lagoons. All PVC material will be disposed of at an approved Canadian landfill or in a Resource Conservation and Recovery Act (RCRA)-compliant facility in the United States. In addition, this ESD changes the clean-up levels for OU-2 from background levels to standards established pursuant to the Commonwealth of Pennsylvania's Land Recycling and Remediation Standards Act ("Act 2").

Occidental Chemical Corporation ("OxyChem"), the current owner and a former operator of the Site, has been performing the remedial action selected in the ROD under a 1994 Administrative Order, which EPA issued under Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), as amended, 42 U.S.C. § 9606(a). Since 2005, OxyChem has also been conducting an FFS for OU-2 under an

EPA Administrative Settlement Agreement and Order on Consent ("2005 Settlement Agreement"). OxyChem's Final FFS Report has informed EPA's decision to issue this ESD.

EPA is issuing this ESD in accordance with Section 117(c) of CERCLA, and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. § 300.435(c)(2)(i). EPA has determined that the planned change to the remedial action for OU-2 is "significant," as defined by Section 300.435(c)(2)(i) of the NCP, and does not fundamentally alter the remedy selected in the ROD with respect to scope, performance, or cost. The documents that form the basis for the decision to modify the remedy have been incorporated into the Administrative Record maintained for the Site in accordance with Section 300.835(a)(2) of the NCP. The ESD will also be incorporated in the Administrative Record. The Administrative Record is available for review during business hours at the information repository in the EPA Region III offices at 1650 Arch Street, Philadelphia, PA, (215) 814-3157, and at an information repository at the Pottstown Public Library, 500 East High Street, Pottstown, PA, (610) 970-6551. The Administrative Record may also be found on the Internet at http://loggerhead.epa.gov/arweb/public/advanced_search.jsp.

Pursuant to Section 117(d) of CERCLA and Section 300.435(c) of the NCP, EPA will publish a public notification in *The Pottstown Mercury* newspaper announcing the issuance of this ESD.

II. BACKGROUND

For a more complete summary of Site history, contamination problems at the Site, and past response actions taken by EPA and the Pennsylvania Department of Environmental Protection ("PADEP", f/k/a "PADER") at the Site, the reader is directed to Sections II and V of the ROD. The ROD can be found in the Administrative Record, which can be reviewed at the public repositories mentioned above, and on the Internet at http://www.epa.gov/reg3hwmd/super/sites/PAD980229298/index.htm

A. Site Location and Ownership/Operations History

The Site is located on Armand Hammer Boulevard in Lower Pottsgrove, Montgomery County, Pennsylvania. The Site property consists of approximately 257 acres and is bounded on three sides by the Schuylkill River.

The Site was formerly operated by Jacobs Aircraft Engine Company, who manufactured aircraft engines there, and Firestone Tire and Rubber Company ("Firestone"), who manufactured tires and PVC resins there. In 1980, Firestone, currently known as Bridgestone/Firestone, Inc., sold the Site to Hooker Chemicals and Plastics Corporation, who later became Occidental Chemical Corporation. OxyChem manufactured PVC resins at the Site until January 2005.

B. Contamination Problems and Remedy Selection

Various EPA investigations of the Site have shown elevated levels of hazardous substances in groundwater, soils, and sediments at the Site. EPA has determined that past manufacturing operations at the Site have led to the release of hazardous substances into the environment. Hazardous substances found at the Site include, among others, trichloroethylene ("TCE"), vinyl chloride monomer, styrene, ethylbenzene, and trans-1-2-dichloroethene ("1-2-DCE"). In 1989, EPA placed the Site on the National Priorities List.

In the 1993 ROD, EPA stated that the principal threat posed by the Site is the groundwater contamination which resulted from former disposal practices and TCE handling operations. The ROD also called for the remediation of the four (4) inactive earthen lagoons, which were used to dispose of PVC waste material until approximately 1974. The specific objectives for the Site clean-up selected in the ROD were to:

1. Restore groundwater in the bedrock aquifer to Federal and State applicable or relevant and appropriate requirements ("ARARs"), including drinking water standards, and to a level that is protective of human health and the environment;

2. Protect non-implicated groundwater and surface water for current and future use; and

3. Prevent migration of chemicals from the earthen lagoons to groundwater or to surface water and to prevent direct contact with lagoon material.

1. Operable Unit 1

EPA selected a remedy for Operable Unit 1 ("OU-1") – the contaminated groundwater plume – that involves extracting and treating groundwater by use of air-stripping, vapor-phase carbon adsorption, and long-term monitoring of groundwater contamination. Construction of the groundwater treatment system ("GTS") was completed by OxyChem in January 1999, and it is currently operated and maintained by OxyChem with EPA oversight under the 1994 Administrative Order.

2. Operable Unit 2

a. Remedy Selection

A Remedial Investigation (RI) conducted by OxyChem in 1993 showed that the four (4) earthen lagoons contained volatile and semi-volatile organic compounds ("VOCs" and "semi-VOCs") as a result of past disposal practices conducted by Firestone during its PVC-manufacturing operations at the Site. Some of the chemicals detected in the earthen lagoons include TCE, 1,2-DCE, vinyl chloride, benzoic acid, and bis(2-ethylhexyl) phthalate. These chemicals are all associated with the manufacture of PVC and are hazardous substances, as defined by Section 101(14) of CERCLA, and are listed at 40 C.F.R. Part 302 in accordance with Section 102(a) of CERCLA.

EPA selected a remedy for OU-2 that included (1) on-site drying and recycling of the PVC material, (2) land-filling of residual PVC material, coal fines, and contaminated soils from the earthen lagoons, and (3) restoration of the earthen lagoon area to original grade. The ROD outlined the following components for the OU-2 remedy:

- Construction of an access road to the earthen lagoons;
- Excavation of PVC material (which includes all PVC sludge), coal fine layers and contaminated soil;
- Storage hopper for excavated materials;
- On-site drying of PVC material with air pollution controls;
- Dried PVC material shall be bagged, stored, and recycled;
- Sampling and analysis as approved by EPA for transportation and disposal of bottom coal fines layer of lagoons, including PVC residuals;
- Sampling and analysis of underlying soils as approved by EPA to document removal of chemicals of concern to background concentrations;
- Restoration of the area to original grade which includes backfilling excavations with clean fill; and
- Institutional Controls.

b. 1995 ESD

On June 29, 1995, EPA issued an ESD changing the method selected in the ROD for disposal of certain material generated in the implementation of the remedy for OU-2. Originally, the ROD provided that such material would be disposed of in an off-site landfill. Pursuant to the 1995 ESD, EPA allowed OxyChem to dispose of this material in an on-site seven-acre Residual Waste Landfill. The material slated for such disposal included (1) recycling residuals that did not exhibit RCRA hazardous characteristics, (2) treated materials that no longer exhibited RCRA hazardous characteristics and met all applicable land disposal restrictions, (3) non-hazardous coal fines underlying the PVC material, and (4) treated coal fines that no longer exhibited RCRA hazardous characteristic and met all applicable land disposal restrictions.

c. Remedy Implementation and the 2005 FFS

The remedy selected for OU-2 has not been implemented because of (1) problems encountered by OxyChem during remedial design pilot studies of technology to be used for drying the potentially recyclable PVC material, (2) the feasibility of ultimately drying the PVC material in a cost-effective manner, and (3) market fluctuations for recycled PVC material.

Two technologies for drying the PVC material for potential recycling – low temperature thermal aeration ("LTTA") and mechanical aeration and radiant heat ("MA/RH") – were tested by OxyChem to determine if they could be implemented on a large scale.

LTTA involved the use of an oven to heat the PVC material to drive off moisture and the use of bag houses to filter the PVC material from the air discharge. After three bag house fires and numerous operating problems, OxyChem terminated its pilot test of LTTA.

MA/RH involved the mixing and moving of PVC material on a concrete pad under a spring structure with treatment of the off-gas through vapor phase carbon. During the turn-over of the PVC material in this structure, radiant heat was used to enhance the drying process. The results of the MA/RH pilot study showed that this method of drying the PVC material could be effective at reducing moisture content levels suitable for preparing the PVC material for recycling. However, it would be labor-intensive, relatively slow, and very expensive. Additionally, MA/RH would require excessive handling of the PVC material by Site personnel and would pose a risk of significant air emissions should air control provisions fail. Further measures such as de-humidification would also be needed to make MA/RH effective. OxyChem informed EPA that the declining price of PVC resin and the necessity of adding de-humidification to the treatment process had adversely impacted the feasibility of the MA/RH process.

In addition to the above difficulties encountered in the remedial design for OU-2, on February 5, 1999, OxyChem requested that EPA issue an Explanation of Significant Difference ("ESD") to revise the clean-up criteria that were selected in the ROD for the soil underlying the earthen lagoons. Occidental raised the issue that arsenic in the earthen lagoons was not related to the PVC sludge in the lagoons, but to natural background conditions at the Site. Since arsenic was a contributor to risk, according to a risk assessment developed during the 1993 Remedial Investigation ("RI"), EPA determined that it was necessary to conduct additional sampling of the earthen lagoons and a Human Health Risk Assessment ("HHRA").

OxyChem conducted additional sampling in the lagoons in August 2001 to better characterize the PVC material in the lagoons and to determine risks. Sampling was conducted at the surface of the lagoons and at different intervals at depth down to the bedrock. Results of this sampling showed that contamination had migrated to the soils beneath the PVC material.

The August 2001 sampling results were used by EPA to develop a HHRA. The HHRA evaluated the health risk associated with exposure to the chemicals detected in the earthen lagoons under current and potential future land use conditions. The results of the HHRA showed an unacceptable carcinogenic risk and/or non-carcinogenic risk to potential future residents if exposed to the contaminants in the lagoons. The risk drivers for an unacceptable carcinogenic and/or non-carcinogenic risk varied in each lagoon, but the main risk drivers were vinyl chloride, bis(2-ethylhexyl) phthalate, TCE, thallium, chromium, and cadmium. The HHRA also included a soil-to-groundwater pathway analysis. Results of the soil-to- groundwater analysis showed a list of twenty seven contaminants in the lagoons that could potentially migrate to the groundwater. Four of the five contaminants of concern for groundwater addressed by the ROD – ethyl benzene, trans-1,2-DCE, vinyl chloride, and TCE – were among the 27 contaminants found in the soil-to-groundwater analysis.

Based on the results of the HHRA and OxyChem's problems implementing the selected remedy for OU-2, EPA determined that it was necessary to conduct an FFS to re-evaluate the clean-up options for the earthen lagoons, using the HHRA information. On September 29, 2005, OxyChem entered into the 2005 Settlement Agreement with EPA to conduct the FFS. On March 21, 2008 EPA approved OxyChem's FFS Final Report, which evaluated various clean-up options for OU-2. The FFS also included sampling of an area outside of the lagoons, where PVC sludge was discovered in 2006. The FFS Final Report and related documents have been incorporated into the Administrative Record for the Site and are available for review at the locations listed above in Section I (Introduction).

III. DESCRIPTION OF SIGNIFICANT DIFFERENCES

This ESD proposes two significant changes to the 1993 ROD and the 1995 ESD. The first change modifies the remedial action for OU-2 by selecting one of the remedial alternatives described in the FFS Final Report. The second change modifies the clean-up levels for OU-2 from background levels to standards established pursuant to the Commonwealth of Pennsylvania's Land Recycling and Remediation Standards Act, 35 Pa. Con. Stat. § 6026.303.

A. Modification of Remedial Action for Operable Unit 2

The alternatives evaluated in the FFS included (1) on-Site disposal in place, (2) on-Site disposal in a corrective action management unit ("CAMU") at an upland location of the Site, (3) international export and off-Site disposal in a Canadian landfill, (4) off-site disposal and incineration in the United States, and (5) off-Site recycling (essentially, the remedy originally selected in the ROD).

After an evaluation of the alternatives proposed in the FFS report, EPA has determined that the remedy selected for OU-2 in the 1993 ROD and the 1995 ESD will be modified. The modified remedy will involve excavation of the PVC material and any material associated with the earthen lagoons, and disposal in an off-site landfill as follows:

- The PVC material will be excavated, solidified (as needed), and exported to Canada for disposal in an off-site landfill. The export of the PVC material and any other waste from the Site shall be in accordance with Section 3017 of the Solid Waste Disposal Act, 42 U.S.C. § 6938, and 40 C.F.R. Part 262, Subpart E.

- The cleanup standards in the earthen lagoon area will be the standards established pursuant to Pennsylvania's Land Recycling and Environmental Remediation Standards Act, 35 Pa. Con. Stat. § 6026.303 set forth in 25 Pa. Code Chapter 250. See Section III.B below for more detailed information about the change from background levels to Act 2 standards. A list of the cleanup levels can be found in Table 1 of this ESD.

- Soils underneath or surrounding (i.e., berms) the PVC material and the coal fine layer will be sampled after the removal of the PVC material. Any soils underneath or surrounding the PVC material, as well as any coal fines, that contain chemicals of

concern in excess of the cleanup standards will be excavated and disposed of off-site in a landfill. This material may be disposed of in an off-Site landfill in the United States in accordance with Section 121(d)(3) of CERCLA and Section 300.440 of the NCP. Otherwise, this material will be disposed of in an approved Canadian landfill in the same manner as the PVC material, as described above.

- Soils from the berms surrounding the PVC material that contain chemicals of concern at levels below the cleanup standards will be used to re-grade the lagoons after all PVC material, and contaminated coal fines and soils are removed.

- Sampling of the area in the floodplain, outside of the earthen lagoons, showed no levels of contamination above the cleanup standards. However, OxyChem will remove any PVC material from the floodplain and export it to Canada in the same manner as the PVC sludge in the earthen lagoons. Upon removal of the PVC material, the area will be replanted utilizing a shade tolerant wet meadow seed mix and appropriate tree and shrub species.

- After excavation and removal of any contaminated soils underneath and surrounding the PVC material and any contaminated coal fines, sampling and analysis of the remaining soils in the earthen lagoons will be conducted to determine whether the cleanup standards have been achieved.

- Since all material from OU-2 which exceeds the cleanup standards will be removed and disposed off-Site, no institutional controls will be required for OU2.

B. Modification to Cleanup Levels Required for Operable Unit 2

The ROD (at page 88) established that the lagoons would be cleaned up to background levels, based on the applicable Commonwealth of Pennsylvania regulations at that time. Subsequent to the issuance of the ROD, the Commonwealth of Pennsylvania signed into law the Land Recycling and Remediation Standards Act ("Act 2"), 35 Pa. Con. Stat. §§ 6026.101-6026.908. Pursuant to 35 Pa. Con. Stat. § 6026.303, the Commonwealth has promulgated standards for regulated substances for each environmental medium, including, but not limited to, soil. According to Act 2, remediation standards can be selected using; 1) Background standards, 2) Statewide health standards, 3) Site-specific standards, or a combination of these (35 Pa.Con. Stat. § 6026.301(3)). For this Site, a combination of Site-specific and Statewide health standards was used to determine the cleanup levels for OU2. The Site-specific standards were determined by using an EPA Soil Screening and Remediation Goals (SSRG) Tool. The EPA SSRG tool is consistent with the methodology outlined in Act 2 for developing site-specific standards. The soil-to-groundwater numbers developed by EPA were then compared to Act 2 statewide direct contact standards (found in Tables 3A of Act 2) and the more stringent value was selected as the cleanup level. Since the EPA SSRG tool did not have parameters for developing standards for inorganics and some organic compounds, the more stringent standard from Act 2 statewide

standards was selected between the standards in Tables 3A and 3B for organics and between 4A and 4B for inorganics. The statewide standards are found in 25 Pa. Code Chapter 25, Appendix A. The cleanup levels for all chemicals of concern for OU2 are set forth in Table 1.

EPA has determined that the Commonwealth's standards are relevant and appropriate to the remedy as modified by this Second ESD and are protective of human health and the environment. All soils underneath and surrounding the PVC material, as well as any coal fine layers in the earthen lagoons, that exceed the cleanup levels for the chemicals of concern shall be excavated and disposed of off-Site, as described above.

C. Modifications Do Not Fundamentally Alter Scope, Performance, or Cost of the Remedy for OU-2

The modifications to the ROD described above do not fundamentally alter the basic features of the selected remedy with respect to scope, performance, or cost. The most significant difference between the remedy selected for OU-2 in the ROD and the modified remedy set forth in this Second ESD involves the handling and disposition of the PVC material: none of the PVC material will be dried on-Site and recycled, but will instead be disposed of in an off-Site landfill. The remedy always contemplated land-filling residual PVC material, contaminated coal fines, and soils.

As stated above, the main objective of the remedy selected for OU-2 in the ROD was to prevent migration of chemicals from the earthen lagoons to groundwater or to surface water and to prevent direct contact with lagoon material. The remedy sought to achieve this objective by excavation and removal of the contaminated material from the earthen lagoons that poses a threat to human health and the environment. The scope (i.e., removal of all contaminated materials in and the re-grading of the lagoons) of the modified remedy remains the same.

In regard to cost, the ROD estimated that the remedy for OU-2 would cost $4,019,000. When adjusted for inflation and current conditions, if implemented today, that remedy would cost approximately $7.9 million. As described in the FFS Final Report, the estimated cost of the modified remedy will be $7,771,000.

IV. ANALYSIS OF MODIFICATIONS

Section 121 of CERCLA, 42 U.S.C. § 9621, requires that the remedy must at least satisfy the following two threshold criteria:

1. **Overall Protection of Human Health and the Environment**. This criterion addresses whether or not a remedy provides adequate protection and describes how risks posed by the contaminated material are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with Applicable or Relevant and Appropriate Requirements.** This criterion addresses whether or not a remedy meets all of the federal and state

environmental standards that are applicable or relevant and appropriate requirements ("ARARs").

As described below, the modifications for OU-2 fully meet these criteria.

A. Overall Protection of Human Health and the Environment

The removal of all the PVC material, as well as any coal fines and soil underneath and surrounding the PVC material, which exhibit levels of the chemicals of concern that are above the cleanup levels in Table 1, will eliminate the potential for migration of contamination to groundwater. The modified remedy will result in the removal and off-site disposal of all contaminated media from the floodplain which will address a concern raised by the local community. The modified remedy can also be implemented at a much lower cost and much more quickly than some of the other alternatives evaluated in the FFS.

B. Compliance with ARARs

Except as described below, the modified remedy shall comply with all ARARs identified in the ROD (see p. 93-94) for the remedy selected for OU-2.

Instead of complying with the applicable portions of the PADER Ground Water Quality Protection Strategy, which prohibits continued groundwater quality degradation and required clean-up of the earthen lagoons to background levels for the chemicals of concern, the modified remedy shall comply with the following ARAR:

<u>Chemical-Specific</u>

Commonwealth of Pennsylvania Standards, 25 PA Code Chapter 250, 250.606, and 250.301-312 (Appendix A, Tables 3B, 4A and 4B).

C. Compliance With Other Laws

All off-Site disposal activities shall be conducted in compliance with all local, state, and federal laws that are applicable at the time of the activities. Page 94 of the ROD lists some of the other laws that shall be complied with. Additionally, the export of the PVC material and any other waste from the Site shall be in accordance with Section 3017 of the Solid Waste Disposal Act, 42 U.S.C. § 6938, and 40 C.F.R. Part 262, Subpart E.

V. SUPPORT AGENCY COMMENTS

In accordance with 40 C.F.R. § 300.435(c)(2), EPA has notified PADEP of the modification to the selected remedy for OU-2 described in this ESD. PADEP concurs with the issuance of this ESD.

VI. AFFIRMATION OF STATUTORY DETERMINATIONS

EPA has determined that the modified remedy described in this Second ESD complies with the statutory requirements of Section 121 of CERCLA, 42 U.S.C. § 9621. EPA believes that the remedy, as modified by this Second ESD, will remain protective of human health and the environment, complies with all Federal and State requirements that are applicable or relevant and appropriate, and is cost-effective.

VII. COMMUNITY INVOLVEMENT

In accordance with Section 117(d) of CECLA and Section 300.435 of the NCP, EPA will publish a notice of availability of this ESD in the *The Pottstown Mercury*. In addition, EPA will hold a public availability session on this ESD to provide the local community with an opportunity to meet with EPA officials to respond to any questions regarding the modified remedy for the Site.

This Second ESD will be incorporated in the Administrative Record maintained for the Site. The Administrative Record includes all documents that form the basis for EPA's selected remedy for the Site. The Administrative Record is available for public review at the following locations:

EPA Region III
1650 Arch Street
Philadelphia, PA 19103-2029
(215) 814-3157
or
Pottstown Library
500 High Street
Pottstown, PA 19464
(610) 970-6551

or
on the Internet at
http://loggerhead.epa.gov/arweb/public/advanced_search.jsp.

Signature on File (4/09/08)

_____ _____

James J. Burke, Director Date
Hazardous Site Cleanup Division