



**Lake Ontario Ordnance Works  
Exposure Unit 8 - Occidental Chemical Company  
Feasibility Study Fact Sheet  
Lewiston, New York**

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**U.S. Army Corps of Engineers  
Buffalo District  
September 2015<sup>1</sup>**

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### **Site Description**

The Defense Environmental Restoration Program for Formerly Used Defense Site (DERP-FUDS) Lake Ontario Ordnance Works (LOOW) is a 7,500-acre site formerly used as a World War II trinitrotoluene (TNT) manufacturing facility that is located in the towns of Lewiston and Porter, New York. The Occidental Chemical Corporation Property (OCCP) is an approximately 304-acre parcel located within the undeveloped buffer zone of the former LOOW in the town of Porter. Exposure Unit (EU) 8 is an approximately 425 foot by 325 foot area located within the southwestern portion of the OCCP (Figure 1 on the next page).

### **Site History**

The largely undeveloped buffer zone of the former LOOW was transferred to the General Services Administration in 1945 for conveyance to private landowners. The Hooker Chemical and Plastics Corporations purchased the land from a private landowner in 1975 and later sold it to the current owner, the Occidental Chemical Corporation. Prior to development of LOOW, the OCCP was mixed agricultural land (e.g., forest, orchard, and farms with some farmsteads and farm ponds).

The OCCP was transferred to private property owners in the mid-1940s. Use and ownership of the land for the period between 1945 and 1975 is unknown. In 1975, Hooker Chemicals and Plastics Corporation purchased this land from a private landowner and subsequently sold the property to Occidental, a wholly-owned subsidiary of Occidental Petroleum Corporation. There are no known impacts by Occidental on the property.

Numerous anomalies were noted on this parcel in photographs from 1944 and 1951. They were investigated by the Corps of Engineers and one anomaly, identified as Exposure Unit 8 (EU 8), was determined to contain contaminants that may cause risk to human health and the environment. EU 8 was present in 1944 when the TNT plant was operational. It contains fill materials and an assumed burn area.

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<sup>1</sup> This fact sheet replaces the June 2015 version in which the description of Alternative 5 on Page 4 was incorrectly described as *Ex situ Chemical Reduction/Oxidation*.

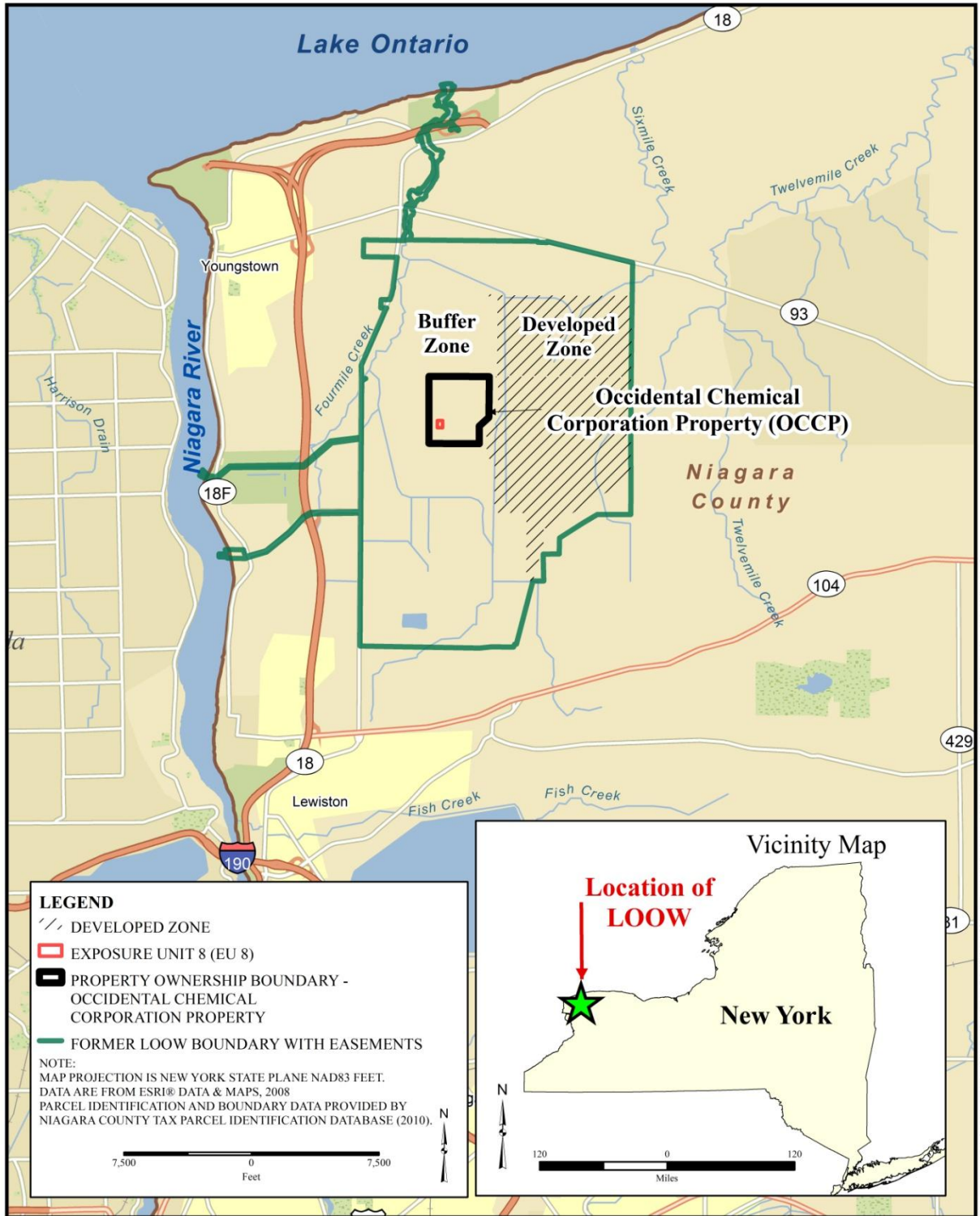


Figure 1: Former LOOW Site, Occidental Chemical Corporation Property and Exposure Unit 8

## Previous Investigations

The feasibility study (FS) for EU 8 of the OCCP is part of ongoing investigations and remediation activities at the former LOOW. Details of previous investigation activities at the former LOOW are available in the following documents:

- *Preliminary Contamination Assessment Report, Operable Unit No. 2, Volume I of II;*
- *Final Report of Results for the Phase I Remedial Investigation at the Lake Ontario Ordnance Works, Niagara County, New York;*
- *Final Report of Results for the Phase II Remedial Investigation at the Lake Ontario Ordnance Works, Niagara County, New York;*
- *Small-Bermed Clearing Supplemental Investigation Summary Report;*
- *Final Report of Results for the Phase III Remedial Investigation at the Lake Ontario Ordnance Works, Niagara County, New York;* and
- *Final Remedial Investigation Report for the Occidental Chemical Corporation Property at Formerly Used Defense Site Former Lake Ontario Ordnance Works, Niagara County, New York.*

## Feasibility Study

### Scope

The FS was prepared to evaluate remedial alternatives to address identified constituents of concern (COCs), TNT and lead, that pose potential unacceptable risk to human receptors at EU 8 within the OCCP. It is prepared as part of ongoing investigation and remediation activities at the former LOOW that are being conducted under the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS). The FS evaluated remedial technologies for COCs and debris identified in site surface and subsurface soil to ensure that the potential remedial alternatives will protect human health and the environment.

### Remedial Action Objective

The remedial action objective for the EU 8 FS is to prevent direct contact with COCs in total soil that may cause unacceptable risk to an exposed hypothetical residential receptor. Preliminary remediation goals (PRGs) were developed for COCs in total soil that contribute 10 percent or greater to cumulative estimated carcinogenic risks or have an estimated target organ specific non-cancer hazard index greater than 1. The human health PRGs were conservatively developed for potentially exposed resident adult and child receptors at EU 8. The risk-based preliminary remediation goal for 2,4,6 – TNT is 18 milligrams per kilogram. The preliminary remediation goal for lead is 400 milligrams per kilogram (6 New York Codes, Rules and Regulations Part 375-6(b)).

### Remedial Alternatives

Five remedial alternatives were identified for screening and detailed analysis using criteria specified in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 300): The five remedial alternatives below were identified in the feasibility study for screening and detailed analysis using criteria specified in the NCP:

a) *Alternative 1: No Action* - This alternative is required under the NCP as a baseline for the FS process. This alternative would not implement any active remedial actions, controls, or monitoring of potential risk. No public awareness or education/training would be initiated regarding potential risks associated with the contaminated soil. Existing limited land-use controls are not considered and would not be maintained.

b) *Alternative 2: Land-Use Controls* – This alternative includes the implementation of land-use controls/institutional controls and engineering controls/access restrictions preventing potential exposure to the COC-contaminated soil. The volume, toxicity, and mobility of the contaminants would not be addressed. Long-term monitoring and site close-out activities would be required.

c) *Alternative 3: Landfill Cap* – This alternative includes placement of a Resource Conservation and Recovery Act Subtitle C equivalent cap keyed into the underlying clay layer. The cap would reduce the mobility of the COC-contaminated soil and protect human health and the environment from exposure to the COCs. Land-use controls/institutional controls, long-term monitoring, and site close-out activities would be required.

d) *Alternative 4: Excavation and Off-site Disposal* – This alternative includes removal of contaminated soil and debris from EU 8. The debris would be screened from the contaminated soil and disposed at a municipal landfill. Contaminated materials would be placed in an off-site permitted treatment, storage, and disposal facility. Some pretreatment/stabilization of the contaminated soil may be necessary to meet land-disposal restrictions. EU 8 would be restored to a condition that allows for unlimited use/unrestricted exposure.

e) *Alternative 5: In situ Chemical Reduction/Oxidation and Stabilization* - This alternative involves on-site treatment of contaminated soil using a proprietary compound formulated to destroy organic explosives and stabilize metals in soil. Debris would be separated from the soil beforehand to enable adequate blending of the compound with the contaminated soil. Removed debris would be disposed off site at an appropriate treatment, storage, and disposal facility. Institutional controls would be implemented that include easements, deed restrictions, and informational devices (signs, state registries, and deed notices). Periodic reviews of established institutional controls would be required and updated if site conditions change.

The table on the next page compares the alternatives based on seven of the nine criteria outlined in CERCLA. The first two criteria are threshold criteria and must be met: overall protection of human health and the environment, and compliance with applicable or relevant and appropriate requirements. The next five criteria are considered balancing criteria and must be addressed: long-term effectiveness and permanence; short-term effectiveness; reduction of toxicity, mobility or volume through treatment; implementability; and cost.

**Comparative Analysis of Alternatives for COCs in Total Soil at OCCP – EU 8**

Alternative	Protection of HH&E	Compliance with ARARs	Short-Term Effectiveness	Long-Term Effectiveness	Reduction of Toxicity, Mobility, or Volume	Implementability	Costs (\$-2015)		
							Total	Capital	Operation, Maintenance, and Monitoring
Alternative 1: No Action	○	○	●	○	○	●	\$0	\$0	\$0
Alternative 2: Land-Use Controls	●	○	●	○	○	●	\$3,049,326	\$364,861	\$2,684,465
Alternative 3: Landfill Cap	●	●	●	●	●	●	\$5,510,363	\$574,836	\$4,935,528
Alternative 4: Excavation and Off-site Disposal	●	●	●	●	●	●	\$846,045	\$846,045	\$0
Alternative 5: In Situ Chemical Reduction/Oxidation and Stabilization	●	●	●	●	●	●	\$6,370,882	\$1,435,354	\$4,935,528

*Legend:*  
 ARARs – applicable or relevant and appropriate requirements    COC – constituent of concern    HH&E – human health and the environment

**Ratings**

Factors	●	●	○
Protection of HH&E	Protective	Moderate rating or not all factors addressed	Not protective
Compliance with ARARs	Compliant	Moderate rating or not all factors addressed	Non-compliant
Short-Term Effectiveness	Protective of the community and workers during the remedial action, low environmental impacts, low period of time to achieve RAOs	Moderate rating or not all factors addressed	Not protective of the community and workers during the remedial action, high environmental impacts, long period of time to achieve RAOs
Long-Term Effectiveness	Low residual risk, adequate and reliable controls	Moderate rating or not all factors addressed	High residual risk, inadequate and unreliable controls
Reduction of Toxicity, Mobility, or Volume	Will reduce toxicity, mobility, and volume through treatment	Moderate rating or not all factors addressed	Will not reduce toxicity, mobility, and volume through treatment
Implementability	Easy to implement, available services and materials, administratively feasible	Moderate rating or not all factors addressed	Difficult to implement, limited availability of services and materials, and low administrative feasibility

## **Administrative Record File**

The administrative record file for the former LOOW contains the FS report and other CERCLA-related documentation used to support the former LOOW FS. Reports and documents in the administrative record may be viewed at the following locations:

### Paper Version

US Army Corps of Engineers  
1776 Niagara Street  
Buffalo, New York 14207  
(by appointment)

### Electronic Version

Town of Lewiston Public Library  
305 South 8th Street  
Lewiston, NY 14092  
Phone: (716) 754-4720

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