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U.S. Army Corps of Engineers
Buffalo District

Building Strong®

December 2016

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 a 304-acre parcel within the undeveloped buffer zone of the former LOOW in the town of Porter. Area of Concern (AOC) 1 is a 425-foot by 325-foot area within the southwestern portion of the OCCP (Figure 1 on the next page).

Site History

Before development of LOOW, the undeveloped buffer zone was mixed agricultural land (e.g., forest, orchard, and farms, with some farmsteads and farm ponds). The undeveloped buffer zone, including the OCCP, was transferred to the General Services Administration in 1945 for conveyance to private landowners. Use and ownership of the OCCP between 1945 and 1975 is unknown. The Hooker Chemical and Plastics Corporation purchased the land from a private landowner in 1975 and later sold it to the current owner, the Occidental Chemical Corporation, 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. For risk assessment purposes, the Corps of Engineers investigated these anomalies. The Corps of Engineers determined that one anomaly, identified as AOC 1 and also known as Exposure Unit (EU) 8, contained contaminants that may cause risk to human health and the environment. AOC 1 was present in 1944 when the TNT plant was operational. It contains fill materials and an assumed burn area.

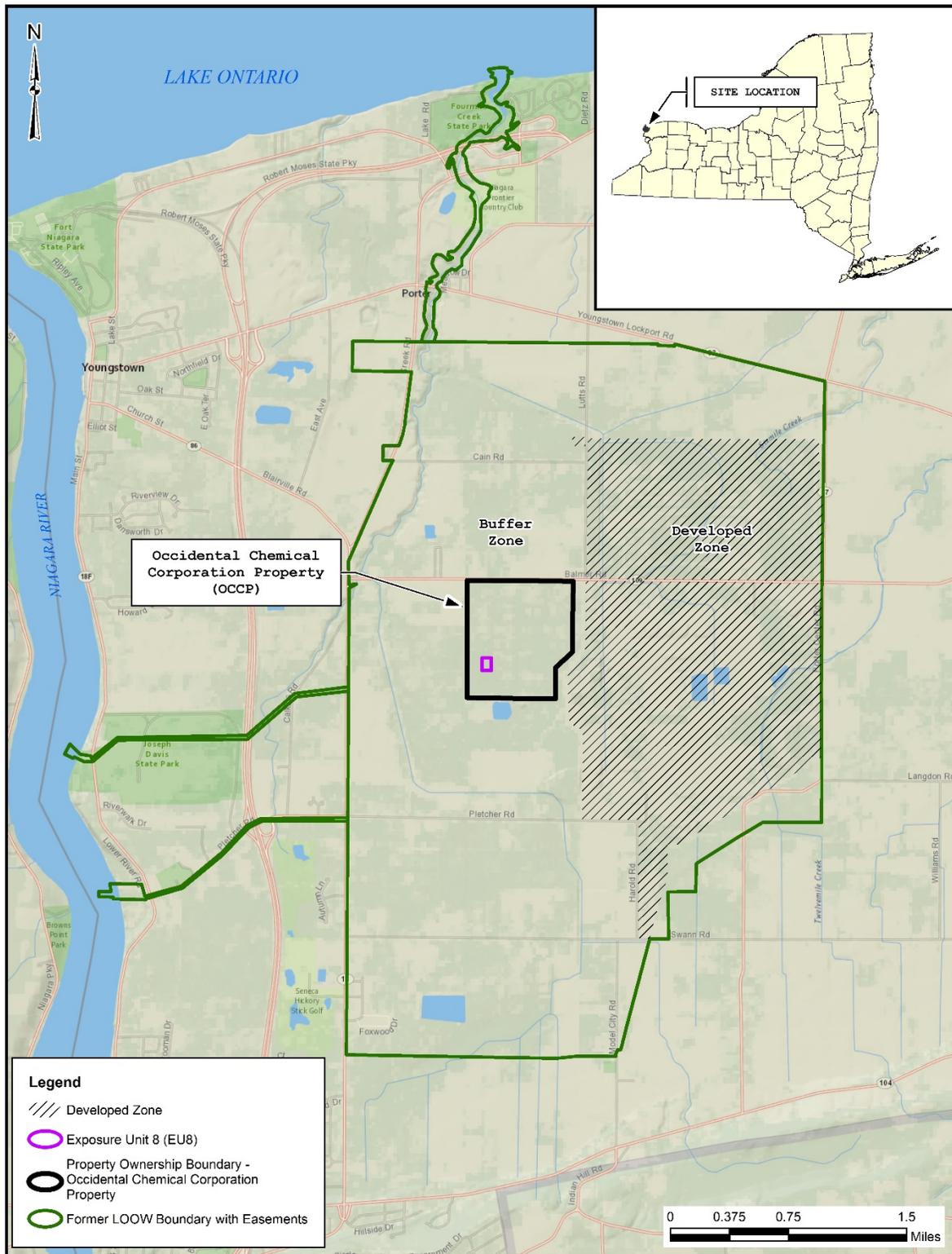


Figure 1: Former LOOW Site, Occidental Chemical Corporation Property and Area of Concern 1 (Exposure Unit 8)

Previous Investigations

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*
- *Final Human Health Risk Assessment of Selected Exposure Units (EU1–EU6, EU8, EU9, EU10) at the Former Lake Ontario Ordnance Works (LOOW), Niagara County, New York*
- *Final Screening Level Ecological Risk Assessment of Selected Exposure Units Within the Former Lake Ontario Ordnance Works (LOOW), Niagara County, New York*
- *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 Exposure Unit–Occidental Chemical Corporation Property at the Former Lake Ontario Ordnance Works Site, Niagara County, New York*

Feasibility Study

The feasibility study presents an evaluation of remedial action alternatives to address identified constituents of concern (COCs), TNT and lead, which pose potential unacceptable risk to human receptors at EU 8 within the OCCP.

Remedial Action Objective

The remedial action objective identified in the feasibility study for AOC 1 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 noncancer hazard index greater than 1. The human health PRGs were conservatively developed for potentially exposed resident adult and child receptors at AOC 1. The risk-based preliminary remediation goal for 2,4,6-TNT is 18 milligrams per kilogram. The PRG for lead is 400 milligrams per kilogram (6 New York Codes, Rules and Regulations Part 375-6(b)).

Remedial Alternatives

The five remedial alternatives below were identified in the feasibility study for screening and detailed analysis using criteria specified in the National Oil and Hazardous Substances Pollution Contingency Plan:

Alternative 1: No Action – This alternative is required under *40 Code of Federal Regulations 300: National Oil and Hazardous Substances Pollution Contingency Plan* as a baseline against which all other alternatives are compared. Under this alternative there would be no remedial response actions implemented to address 2, 4, 6-TNT and lead in total soil. Engineering and land-use controls would not be implemented. There would be no public awareness or education training about potential risks associated with the contaminated soil.

Alternative 2: Land-Use Controls – This alternative includes the implementation of land-use controls/institutional controls and engineering controls/access restrictions to prevent potential exposure to the COC-contaminated soil. The contaminated soil would not be treated or removed. This alternative would prohibit recreational use of and access to AOC 1. It limits land or resource use by providing information that helps modify, limit, or eliminate human contact on site. The institutional controls and engineering controls/access restrictions may include environmental easements, deed restrictions, deed notices, consent orders, groundwater use restrictions, fencing, access controls, and signage. This alternative includes long-term monitoring and maintenance with periodic (every five years) reviews for a minimum of 30 years.

Alternative 3: Landfill Cap – This alternative includes the placement of a low permeability cap over the contaminated soil to prevent human and ecological exposure to the contaminants. A Resource Conservation and Recovery Act Subtitle C-equivalent cap would be placed over the contaminated fill area and keyed into the underlying native clay. The cap would generally consist of an upper layer, a drainage layer, a low permeability layer, and a grading layer. This alternative includes land-use controls, long-term monitoring, and maintenance with periodic (every five years) reviews to assess effectiveness of the remedial action.

Alternative 4: Excavation and Off-Site Disposal – This alternative includes excavating and disposing off-site all impacted soil that contains 2,4,6-TNT and lead above the remediation goals. Excavated soil and comingled debris would be disposed of at a permitted transportation, storage, and disposal facility. Some pretreatment/stabilization of contaminated soil may be necessary to meet land-disposal restrictions if analytical data determines that the contaminated soil is Resource Conservation and Recovery Act hazardous waste in accordance with 40 Code of Federal Register Part 261. AOC 1 would be restored to a condition that allows for unlimited use and unrestricted exposure. Soil sampling would be performed to confirm that contaminated soil above the remediation goals has been removed.

Alternative 5: In situ Chemical Reduction/Oxidation and Stabilization – This alternative includes on-site treatment of contaminated soil using chemical reduction/oxidation to reduce the 2,4,6-TNT concentrations and stabilize lead in soil. Debris comingled with the contaminated soil would be removed prior to soil treatment. The removed debris would be disposed of at a permitted treatment, storage, and disposal facility. Contaminated soil would be treated on-site and would remain in AOC 1. Soil sampling would be performed to confirm that contaminated soil above the remediation goals has been treated. This alternative includes land-use controls, long-term monitoring, and maintenance with periodic (every five years) reviews to evaluate the effectiveness of the remedial action.

The table on the next page compares the alternatives based on seven of the nine criteria outlined in the Comprehensive Environmental Response, Compensation, and Liability Act (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.

The remaining two evaluation criteria, state and community acceptance, are based on comments received on the proposed plan, and will be addressed in a decision document.

Proposed Plan

The Corps of Engineers' preferred alternative put forth in the proposed plan is Alternative 4: Excavation and Off-Site Disposal, to address soil contamination at AOC 1 of the OCCP. Alternative 4 is considered protective in the long term because all contaminated soils exceeding the risk-based remediation goals will be removed from AOC 1. Alternative 4 also provides the best balance of long-term effectiveness, short-term effectiveness, and cost. It has the highest implementability rating of the evaluated alternatives. Other AOCs within OCCP (AOCs 2, 3, 4, 5, and 6) do not require any further action by the Department of Defense.

Next Step

The proposed plan and supporting documents are available in the Reports Section of the Buffalo District website at:
<http://www.lrb.usace.army.mil/Missions/HTRW/DERPFUDS/LakeOntarioOrdnanceWorks.aspx>
and have been placed in the administrative record file for LOOW (locations listed on the next page). The public is encouraged to review and comment on all the alternatives presented in the proposed plan. The public comment period for the proposed plan begins December 5, 2016, and ends February 7, 2017.

A public meeting will be conducted at the Town of Lewiston Senior Center, 4361 Lower River Road, Youngstown, New York 14171, on Wednesday, January 11, 2017, beginning at 6:30 p.m. A court recorder will be available to record verbal comments after the presentation. Written comments may be provided that evening, emailed to derpfuds@usace.army.mil, or mailed before the close of the comment period to the address below:

U.S. Army Corps of Engineers, Buffalo District
Attention: Environmental Project Management Team
1776 Niagara Street
Buffalo, New York 14207

The preferred alternative may be modified based on any new information acquired during the designated public comment period. Responses to comments received will be provided in the record of decision, which will identify the selected remedy to be implemented.

Comparative Analysis of Alternatives for COCs in Total Soil at OCCP – Area of Concern 1 (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 Dollars)		
							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 6: In Situ Chemical Reduction/Oxidation and Stabilization	●	●	●	●	●	●	\$6,370,882	\$1,435,354	\$4,935,528
<i>Legend: ARARs – applicable or relevant and appropriate requirements HH&E – human health and the environment RAOs – remedial action objectives</i>									
Ratings									
Factors	●		●			○			
Protection of HH&E	Protective		Moderate rating or not all factors addressed			Not protective			
Compliance with ARARs	Compliant or no ARARs were identified		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 LOOW contains CERCLA-related documentation used in the decision-making process for the site. Reports and documents in the administrative record file are available electronically at the following locations:

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

Youngstown Free Library
240 Lockport Street
Youngstown, New York 14174
Phone: (716) 745-3555

By appointment only

U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207
Phone: 800-833-6390 (Option 4)

**U.S. ARMY CORPS OF ENGINEERS – BUFFALO DISTRICT
ENVIRONMENTAL PROJECT MANAGEMENT TEAM**

1776 NIAGARA STREET, BUFFALO, NEW YORK 14207

Phone: 800-833-6390 (Option 4)

Email: derpfuds@usace.army.mil

Website: <http://www.lrb.usace.army.mil/Missions/HTRW/DERPFUDS/LakeOntarioOrdnanceWorks.aspx>

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