

# Technical Memorandum No. 2

## Occidental Chemical Corporation Property – Screening-Level Ecological Risk Assessment Work Plan Addendum

To: Mick Senus, Project Manager, USACE-Buffalo

From: Earth Resources Technology, Inc./EA Engineering, Science, and Technology, Inc.

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Subject: Final Screening-Level Ecological Risk Assessment Work Plan Addendum

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The U.S. Army Corps of Engineers, Baltimore District (USACE–Baltimore District) has retained Earth Resources Technology, Inc. (ERT), under Contract No. W912QR-08-D-0012 to conduct a screening-level ecological risk assessment (SLERA) for the Occidental Chemical Corporation Property (OCCP) of the former Lake Ontario Ordnance Works (LOOW), located in Niagara County, New York. ERT has subcontracted EA Engineering, Science, and Technology, Inc. (EA), to prepare this SLERA Work Plan Addendum and perform the SLERA. In support of the SLERA, a Work Plan is needed to identify the appropriate risk assessment guidance, methodology, toxicity values, and exposure parameters that will be used in the SLERA.

Previous SLERAs have been performed on various other exposure units (EUs) located within the former LOOW following approved SLERA work plans. Because there are existing approved work plans, and methodologies proposed for the OCCP SLERA do not differ significantly from those plans, a separate work plan for the OCCP SLERA will not be required. Instead, the OCCP SLERA will follow the procedures set forth in the June 2009 SLERA Work Plan (USACE 2009). This Work Plan Addendum was prepared to identify changes in approach, screening values, exposure values, or toxicity values from the 2009 SLERA Work Plan that will be incorporated into the SLERA for the OCCP.

The SLERA will include new data collected in the vicinity of the Occidental ground scar (previously identified Exposure Unit [EU] 8), as well as other recently investigated areas of interest, including anomalous aerial photographic features identified adjacent to the property access road and suspect disposal areas identified during site reconnaissance. Samples located within the OCCP ground scar will be assessed separately from the other recently investigated areas of interest with a goal of potential separation of any risks associated with the different locations. Based on the results of the initial separation of areas it may be determined that the separation is appropriate, or that combining locations

may be valid. Any subsequent combination of locations will be explained in the SLERA. Surface water and sediment results will be screened against criteria used in the investigation of the Southwest Drainage Ditch (USACE 2011). For analytes not reported during that investigation, criteria from the original sources used during the investigation (MacDonald and Ingersoll 2002 for sediment and USACE 2007 prepared by SAIC for surface water) will be used (see Table 1). The assessment will remain qualitative in nature, as assessment of such a limited data set (i.e., two surface water and sediment samples) is not typically recommended. A brief discussion of receptors that may inhabit the pond(s) and how the pond(s) relates to other surface water bodies will be included in the SLERA.

The matrix of primary concern to be addressed in the OCCP SLERA is surface soil, consistent with the matrix addressed in the 2009 Phase IV Work Plan.

The SLERA methodology has not changed since that proposed in 2009 SLERA Work Plan. In addition, ecological risk screening levels for soil have not changed since 2009; consequently the screening values shown in Tables 2-1 and 2-2 of the 2009 SLERA Work Plan remain valid. Finally, toxicity reference values (TRVs), documented in Table 3-1 have not changed or been updated since presented in the 2009 SLERA Work Plan and remain valid.

There have been no changes to the approach, screening values, exposure values, or toxicity values as presented in the 2009 SLERA Work Plan. With the exception of screening detected concentrations in pond sediment and surface water and a qualitative discussion of pond receptors as discussed above, the OCCP SLERA will follow the 2009 SLERA Work Plan with no proposed amendments.

## References

- MacDonald, D.D. and C.G. Ingersoll. 2002. *A Guidance Manual to Support the Assessment of Contaminated Sediments in Freshwater Ecosystems*. EPA-905-B02-001-C. December.
- United States Army Corps of Engineers (USACE). 2007. *Baseline Risk Assessment Report for the Niagara Falls Storage Site*. Prepared by SAIC. December.
- USACE. 2009. *Final Screening-Level Ecological Risk Assessment Work Plan for Phase IV Remedial Investigation/Feasibility Study at the Former Lake Ontario Ordnance Works (LOOW) Niagara County, New York, Addendum to the Screening-Level Ecological Risk Assessment At Selected Exposure Units Within the Former Lake Ontario Ordnance Works (LOOW) Niagara County, New York Work Plan*. June.
- USACE. 2011. *Final Site Inspection Report for the Lewiston-Porter Central School District at the Former Lake Ontario Ordnance Works (LOOW) Niagara County, New York*. March.

TABLE 1. ECOLOGICAL SCREENING VALUES FOR DETECTED POND ANALYTES

Detected Analyte	Surface Water Screening Value	Units	Sediment Screening Value	Units
<b>Semivolatile Organic Compounds</b>				
2-methylphenol	13	µg/L	ND	µg/kg
4-methylphenol	NSA	µg/L	ND	µg/kg
Diethyl phthalate	210	µg/L	ND	µg/kg
Fluoranthene	ND		423	µg/kg
Naphthalene	ND		176	µg/kg
Phenol	5	µg/L	ND	µg/kg
<b>Radionuclides</b>				
Alpha	NSA	pci/L	NSA	pci/g
Beta	NSA	pci/L	NSA	pci/g
Lead-212	ND		NSA	pci/g
Lead-214	ND		NSA	pci/g
Potassium-40	ND		NSA	pci/g
Protactinium-234	ND		NSA	pci/g
Radium-226	ND		NSA	pci/g
Radium-228	ND		NSA	pci/g
Thallium-208	ND		NSA	pci/g
<b>Volatile Organic Compounds</b>				
1,2,4-trichlorobenzene	ND		NSA	µg/kg
1,3,5-trimethylbenzene	ND		NSA	µg/kg
1,3-dichlorobenzene	ND		NSA	µg/kg
1,4-dichlorobenzene	ND		NSA	µg/kg
2-butanone	14000	µg/L	NSA	µg/kg
4-chlorotoluene	ND		NSA	µg/kg
Acetone	ND		NSA	µg/kg
Carbon disulfide	0.92	µg/L	NSA	µg/kg
Chloromethane	NSA	µg/L	ND	µg/kg
N-propylbenzene	ND		NSA	µg/kg
Toluene	100	µg/L	ND	µg/kg
<b>Explosives</b>				
3-nitrotoluene	NSA	µg/L	ND	µg/kg
RDX	NSA	µg/L	ND	µg/kg
<b>Total Metals</b>				
Aluminum	100	µg/L	NSA	mg/kg
Arsenic	150	µg/L	9.79	mg/kg
Barium	4	µg/L	NSA	mg/kg
Beryllium	1100	µg/L	NSA	mg/kg
Cadmium	2.09	µg/L	0.99	mg/kg
Calcium	116400	µg/L	NSA	mg/kg
Chromium	74.11	µg/L	43.4	mg/kg
Cobalt	5	µg/L	NSA	mg/kg
Copper	8.96	µg/L	31.6	mg/kg
Iron	300	µg/L	NSA	mg/kg
Lead	3.78	µg/L	35.8	mg/kg

TABLE 1. ECOLOGICAL SCREENING VALUES FOR DETECTED POND ANALYTES

Detected Analyte	Surface Water Screening Value	Units	Sediment Screening Value	Units
Lithium	14	µg/L	NSA	mg/kg
Magnesium	82000	µg/L	NSA	mg/kg
Manganese	120	µg/L	NSA	mg/kg
Nickel	52	µg/L	22.7	mg/kg
Potassium	53000	µg/L	NSA	mg/kg
Selenium	ND	µg/L	NSA	mg/kg
Silver	0.1	µg/L	NSA	mg/kg
Thallium	ND	µg/L	NSA	mg/kg
Vanadium	14	µg/L	NSA	mg/kg
Zinc	58.91	µg/L	121	mg/kg

Surface water values from USACE (2007).

Sediment screening values consensus-based threshold effect concentrations from MacDondald and Ingersoll (2002).

NSA = No screening level available.

ND = Not Detected in this medium.