

**FINAL**  
**GROUNDWATER MONITORING WELL**  
**DECOMMISSIONING WORK PLAN**

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**Former Lake Ontario Ordnance Works Sites, Niagara County,  
New York**

*Prepared for:*



**US Army Corps  
of Engineers®**  
*BUILDING STRONG®*

**U.S. Army Corps of Engineers  
Baltimore District**

**Contract No.: W912DR-06-D-0002  
Delivery Order: 0009  
FUDS Project No.: C02NY0025**

*Prepared by:*

**ERT, Inc.  
Laurel, Maryland 20707  
(301) 361-0620**

**January 2013**

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### COMPLETION OF SENIOR TECHNICAL REVIEW

This document has been produced within the framework of the ERT, Inc. (ERT) total quality management system. As such, a senior technical review, as defined in the Quality Control Plan (QCP) for this project, has been conducted. This included review of the overall design addressed within the document, proposed or utilized technologies and alternatives and their applications with respect to project objectives and framework of U.S. Army Corps of Engineers regulatory constraints under the current Defense Environmental Restoration Program for Formerly Used Defense Site No.: C02NY0025 project, within which this work has been completed. Comments and concerns resulting from review of the document have been addressed and corrected as necessary.



13 December 2012

Date

Senior Technical Reviewer, ERT

### COMPLETION OF INDEPENDENT TECHNICAL REVIEW

This document has been produced within the framework of ERT's total quality management system. As such, an independent technical review, appropriate to the level of risk and complexity inherent in the project as defined in the QCP for this project, has been conducted. This included review of assumptions (methods, procedures, and material used in analyses), alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product accomplishes the stated project objectives. Comments and concerns resulting from review of the document have been addressed and corrected as necessary.



15 December 2012

Date

Independent Technical Reviewer, ERT

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## ACRONYMS AND ABBREVIATIONS

AEC	Atomic Energy Commission
AFP	Air Force Plant
bgs	below ground surface
CELRB	U.S. Army Corps of Engineers, Buffalo District
CWM	CWM Chemical Services, LLC
DERP	Defense Environmental Restoration Program
DOE	Department of Energy
ERDA	Energy Research and Development Administration
ERT	ERT, Inc.
ft	foot or feet
FUDS	Formerly Used Defense Sites
FUSRAP	Formerly Utilized Sites Remedial Action Program
GPS	global positioning system
ID	identification
IDW	investigative derived waste
LOOW	Lake Ontario Ordnance Works
MW	monitoring well
NFSS	Niagara Falls Storage Site
No.	number
NYSDEC	New York State Department of Environmental Conservation
PVC	polyvinyl chloride
Somerset	Somerset Group, Inc.
SOW	statement of work
TNT	trinitrotoluene
USACE	U.S. Army Corps of Engineers
VP	Vicinity Property

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## 1.0 INTRODUCTION

This Work Plan has been prepared by ERT, Inc. (ERT) in accordance with the Statement of Work (SOW) for Delivery Order 0008 for Architectural/Engineering Services at the former Lake Ontario Ordnance Works (LOOW), Niagara County, New York, under the Hazardous, Toxic, and Radioactive Waste Indefinite Delivery/Indefinite Quantity Contract W912-QR-08-D-0012. This SOW was issued by the U.S. Army Corps of Engineers, Buffalo District (CELRB) on 17 August 2011 (U.S. Army Corps of Engineers [USACE], 2011) under the Defense Environmental Restoration Program-Formerly Used Defense Sites (DERP-FUDS) Project Number C02NY0025.

This Work Plan presents the procedures that will be implemented to decommission 24 monitoring wells (MWs) at the former LOOW, hereinafter referred to as “the site.” **Figure 1-1**, the Site Location, depicts the general locality and orientation of the site. Additionally, this Work Plan presents selection and implementation procedures for the decommissioning of MWs that are consistent with the New York State Department of Environmental Conservation (NYSDEC) guidance document, *CP-43: Groundwater Monitoring Well Decommission Policy* (NYSDEC, 2009).

### 1.1 Purpose, Scope, and Objectives

The purpose of this Work Plan is to present MWs identified for decommissioning, the methodology selected for decommissioning, the implementation procedures, and documentation process for the proper abandonment in accordance with NYSDEC guidance (NYSDEC, 2009). NYSDEC guidance recommends that any MW that is unneeded and/or unsuited for reuse be decommissioned.

There are currently 56 MWs at the site, 24 of which have been identified by CELRB as unneeded and/or unsuited for reuse at this time, and as such, satisfy the recommendation for decommissioning (**Figure 1-2**). The 24 MWs to be decommissioned are located on properties owned by CWM Chemical Services, LLC (CWM) and Somerset Group, Inc. (Somerset). **Figure 1-3** through **Figure 1-5** provide detailed aerial views of MW locations selected for decommissioning. This Work Plan presents the procedures that will be implemented to decommission the 24 MWs satisfying the criteria for decommissioning.

The scope of activities that will be performed under this Work Plan includes the following:

- decommissioning selected MWs using the grout-in-place methodology;
- completing applicable site restoration activities; and
- properly documenting the decommissioning effort.

The overall objective of this decommissioning effort is to remove any potential for adverse environmental effects due to unprotected, neglected, and/or improperly abandoned MWs. The primary reason for decommissioning is to remove any potential preferential pathway to groundwater. Proper MW decommissioning will:

- significantly reduce the potential for contamination to be introduced to the subsurface;
- prevents any unprotected and/or neglected MW from contributing to the unwanted mixing of groundwater and/or degradation of water quality within an aquifer; and

- removes MW construction materials to prevent interference with potential future construction and/or excavation activities that may occur at the site.

## 1.2 Site Background Information

In 1942, the War Department obtained a 7,500-acre parcel of land in northwestern Niagara County, New York for the construction of a trinitrotoluene (TNT) production facility, designated as the Lake Ontario Ordnance Works (**Figure 1-2**). Production operations, production support, and facility storage occupied 2,500 acres of the eastern portion of the LOOW. The remaining 5,000 acres were left undeveloped, to serve as a buffer zone for the TNT production facility, and to allow for the possible expansion of TNT production. Expansion of the facility never occurred, and in 1943, after nine months of operation, the LOOW was decommissioned due to excess TNT production at other War Department facilities. The eastern 2,500 acres, which comprised the TNT production area, were subsequently used by other agencies of the Department of Defense, including the U.S. Air Force and U.S. Navy, for manufacturing plants (i.e., U.S. Air Force Plant 38 [AFP-38], AFP-68, and the U.S. Navy Interim Production Pilot Plant) to produce high-efficiency boron fuels. The U.S. Army subsequently used the acreage for the construction of a Nike Missile Base.

In the mid-1940s, 1,500 acres of the southern portion of the former LOOW were transferred to the USACE Manhattan Engineer District. The Manhattan Engineer District later gave rise to the U. S. Atomic Energy Commission (AEC). In 1974, the AEC was replaced by the Energy Research and Development Administration (ERDA) and the U.S. Nuclear Regulatory Commission. In 1977, ERDA became the U.S. Department of Energy (DOE). While under operation by the Manhattan Engineer District, radioactive materials were stored on portions of the southern 1,500 acres of the former LOOW. However, between the 1950s and 1980s, radioactive materials housed on the acreage were consolidated, removed, and transferred to the current 191-acre Niagara Falls Storage Site (NFSS). During consolidation, the acreage surrounding the NFSS, formerly used by AEC and its predecessor, was designated as “Vicinity Properties” (VPs) to facilitate the DOE environmental cleanup and closure. The NFSS and the VPs that remain open are currently being addressed under the Formerly Utilized Sites Remedial Action Program (FUSRAP). The acreage comprising the former Wastewater Treatment Plant property is located north and adjacent to the northwestern corner of NFSS and was designated VP X.

In the subsequent years, numerous investigations have been undertaken to document the environmental quality at the site. During these investigation activities, a total of 56 groundwater MWs were advanced and completed within the footprint of the site to investigate groundwater quality. **Appendix B** includes a complete list of MWs at the site with their respective construction details and associated stratigraphy.

## 1.3 Organization of Work Plan

Each section of this Work Plan provides information specific to the purpose, scope, and objectives of this task. This Work Plan includes the following sections and subject material:

- Section 1.0 provides project objectives, historical information regarding the site, and the Work Plan organizational structure;
- Section 2.0 details the determinations to be made prior to decommissioning of the MWs, and the MWs selected for decommissioning;

- Section 3.0 presents methodology for selecting and implementing decommissioning procedures;
- Section 4.0 details field activity documentation forms and items to be included in the post-decommissioning close-out report; and
- Section 5.0 provides the Work Plan references.

**Table 1-1. Summary of Installation History for MWs Identified for Decommissioning**

<b>Well ID</b>	<b>Property Owner</b>	<b>Associated Investigation</b>	<b>Construct Start Date</b>	<b>Construct End Date</b>	<b>Reference Figure*</b>
MW-B-1S	CWM	Acres RI	1988	1988	Figure 1-3
MW-B-1D	CWM	Acres RI	1988	1988	Figure 1-3
MW-C-1S	CWM	Acres RI	1988	1988	Figure 1-4
MW-C-1D	CWM	Acres RI	1988	1988	Figure 1-4
MW-C-2D	CWM	Acres RI	1988	1988	Figure 1-4
MW-C-3S	CWM	Acres RI	1988	1988	Figure 1-4
MW-C-3D	CWM	Acres RI	1988	1988	Figure 1-4
MW-D-1	CWM	Acres RI	1988	1988	Figure 1-4
MWS-1S	Somerset	Acres PCA	11/22/1991	11/22/1991	Figure 1-5
MWS-1I	Somerset	Acres PCA	12/13/1991	12/17/1991	Figure 1-5
MWS-1D	Somerset	Acres PCA	11/25/1991	12/4/1991	Figure 1-5
MWS-2I	Somerset	Acres PCA	12/11/1991	12/13/1991	Figure 1-5
MWS-2D	Somerset	Acres PCA	12/5/1991	12/13/1991	Figure 1-5
MWS-3S	Somerset	Acres PCA	12/27/1991	12/27/1991	Figure 1-5
MWS-3I	Somerset	Acres PCA	12/27/1991	12/31/1991	Figure 1-5
MWS-3D	Somerset	Acres PCA	12/17/1991	12/31/1991	Figure 1-5
MWS-4I	Somerset	Acres PCA	1/6/1992	1/9/1992	Figure 1-5
MWS-4D	Somerset	Acres PCA	1/3/1992	1/9/1992	Figure 1-5
C2-3-BP5	Somerset	Phase II RI	11/7/2000	11/7/2000	Figure 1-5
C2-3-BP7	Somerset	Phase II RI	11/27/2000	11/27/2000	Figure 1-5
C2-5-BP4	Somerset	Phase II RI	8/9/2000	8/9/2000	Figure 1-5
C2-5-BP5	Somerset	Phase II RI	11/7/2000	11/7/2000	Figure 1-5
C2-5-E200	Somerset	Phase II RI	8/9/2000	8/9/2000	Figure 1-5
C2-6-BP1	Somerset	Phase II RI	11/6/2000	11/6/2000	Figure 1-5

*Legend:*  
 CWM = CWM Chemical Services, LLC  
 Somerset = Somerset Group, Inc.  
 \* = reference figure in this Monitoring Well Decommissioning Work Plan

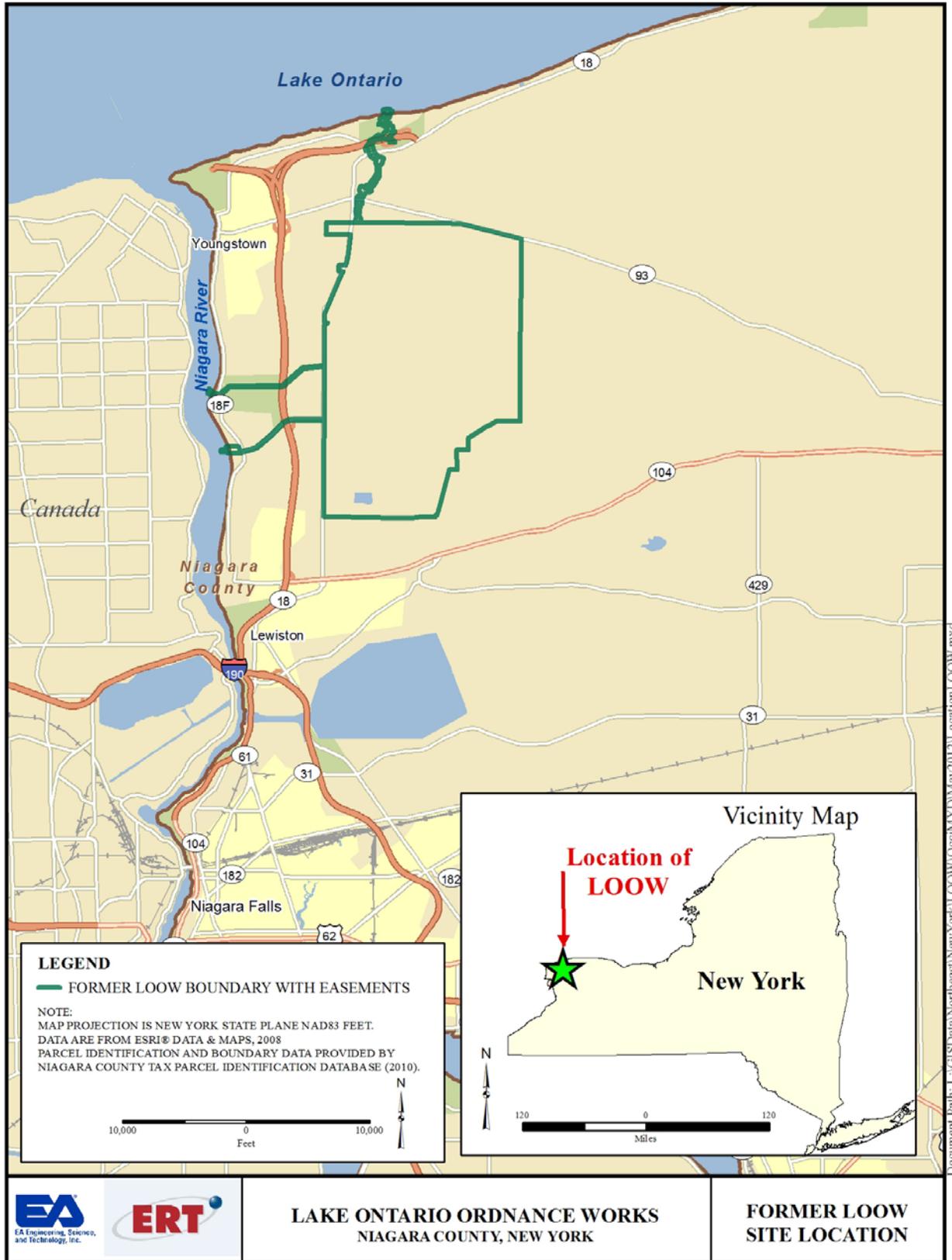
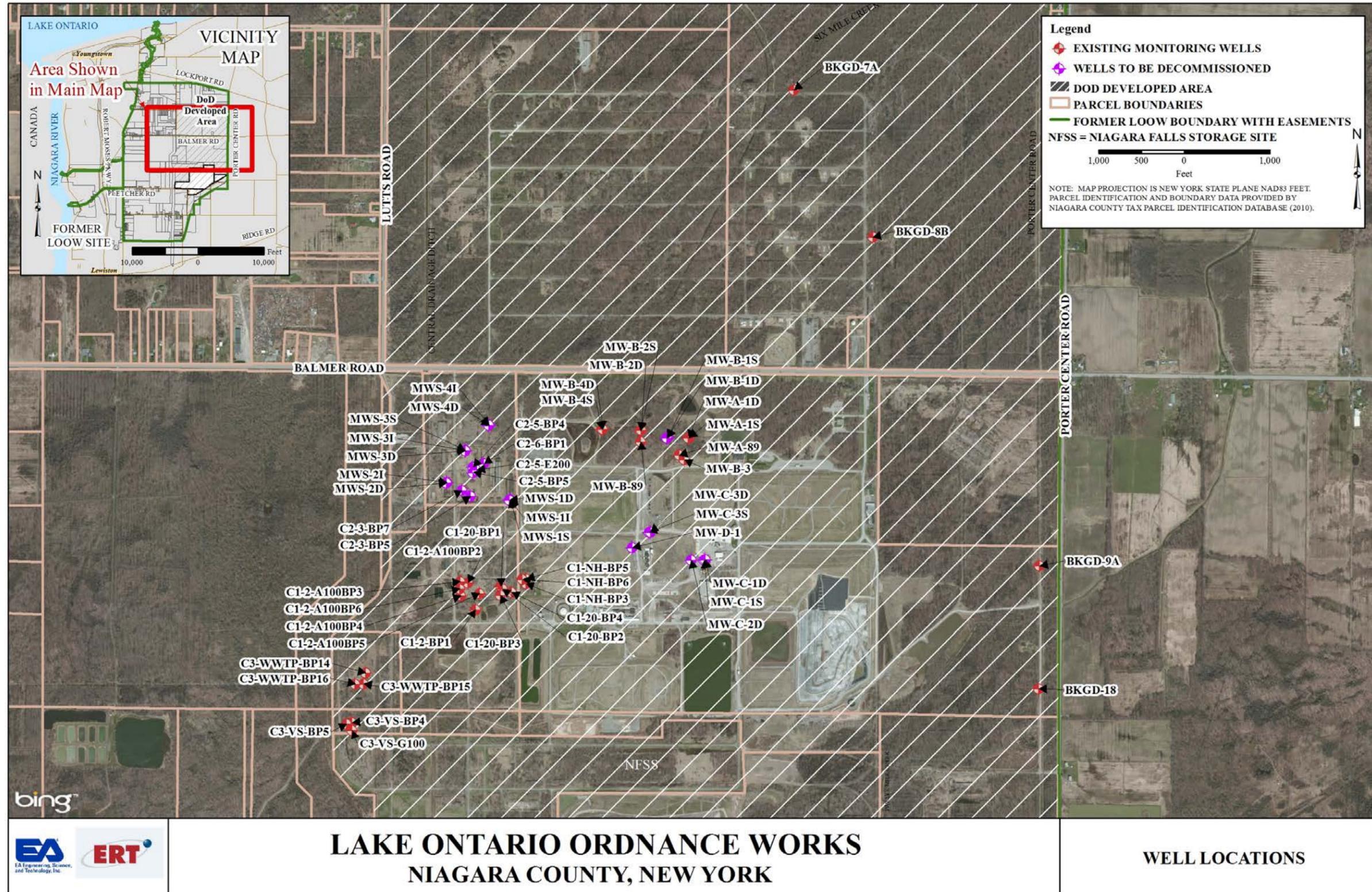


Figure 1-1: Site Location

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**LAKE ONTARIO ORDNANCE WORKS  
NIAGARA COUNTY, NEW YORK**

**WELL LOCATIONS**

Figure 1-2: Groundwater MWs at LOOW

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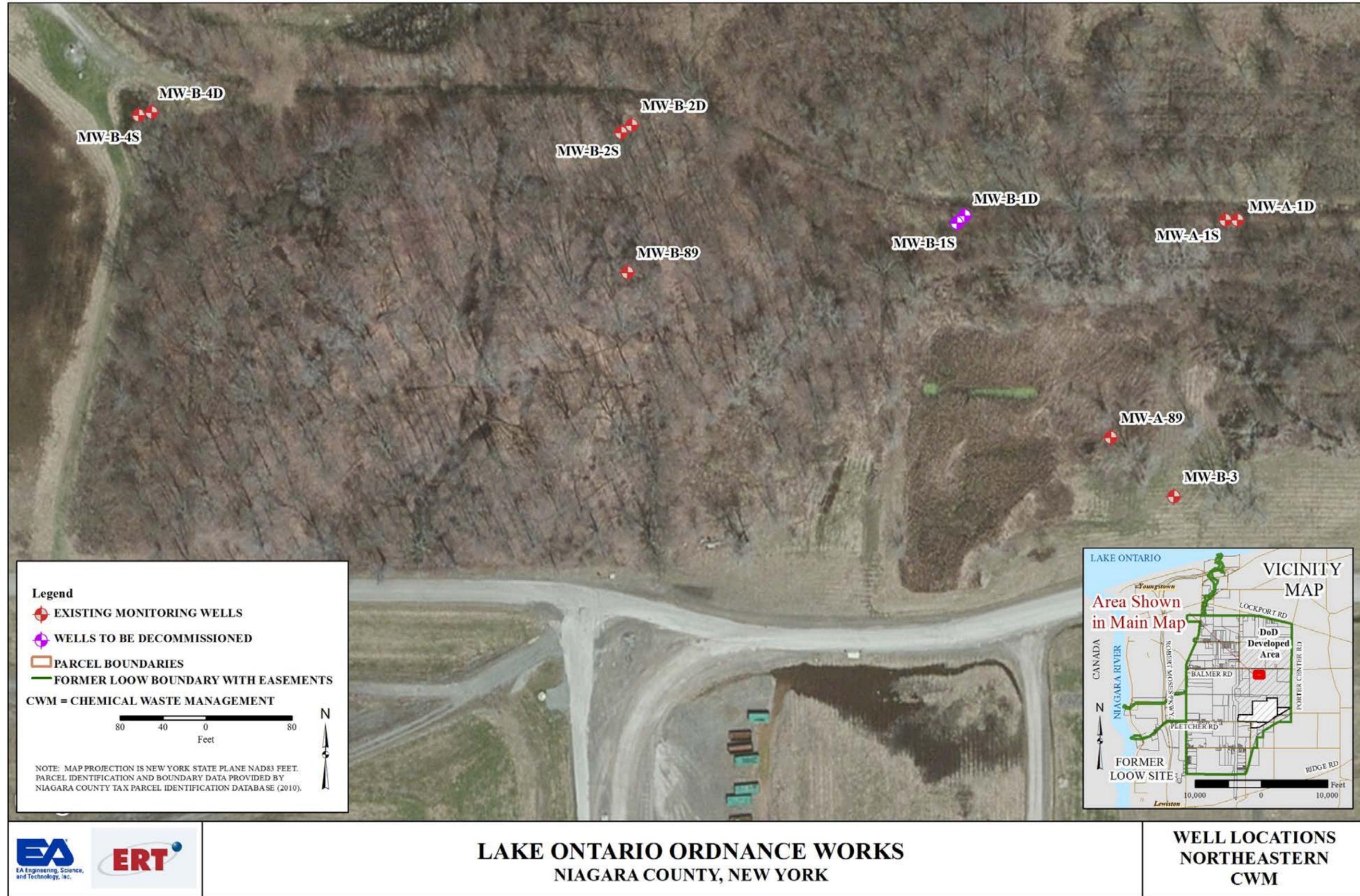


Figure 1-3: Northeastern CWM MW Locations Identified for Decommissioning

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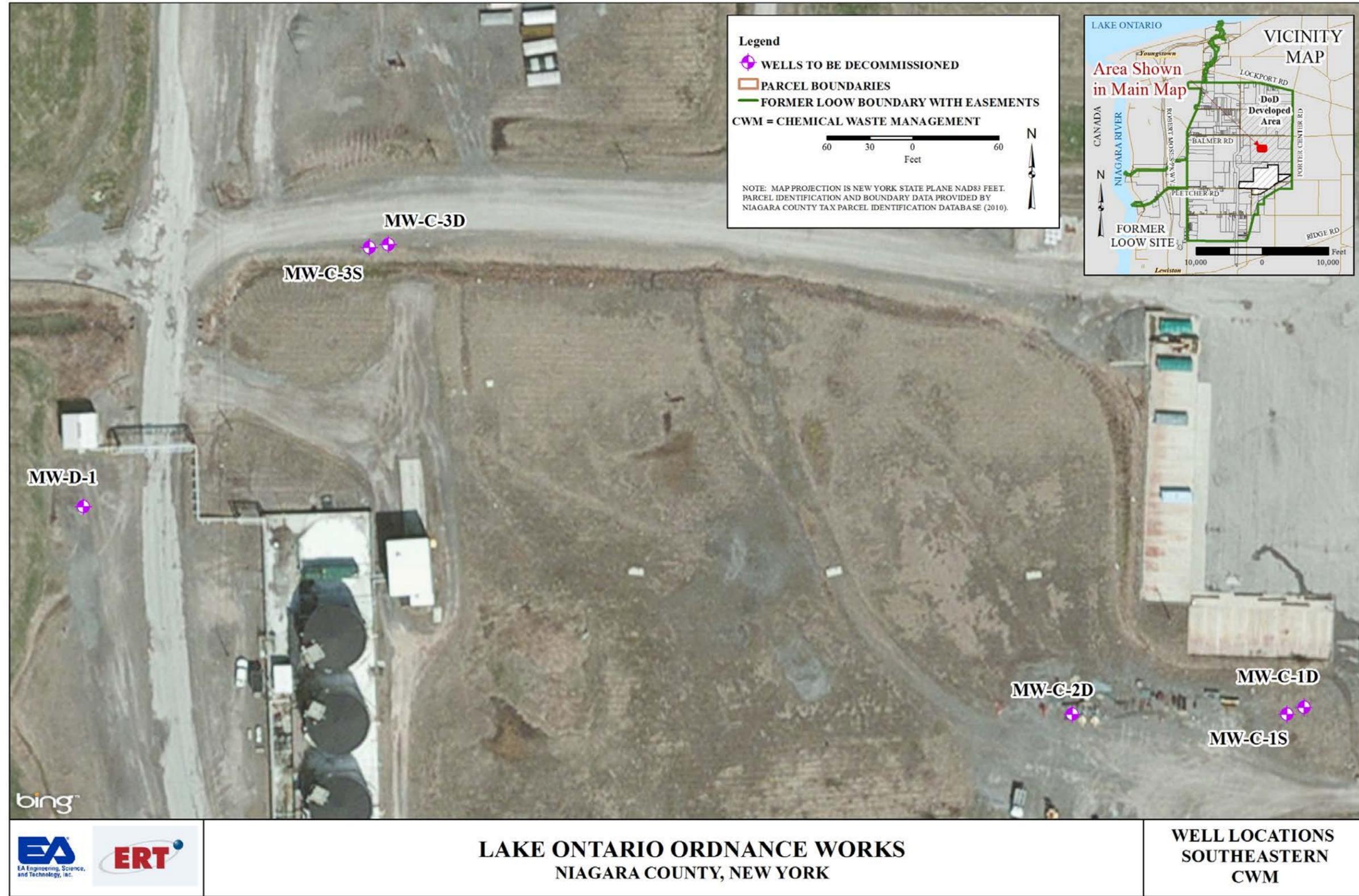


Figure 1-4: Southeastern CWM MW Locations Identified for Decommissioning

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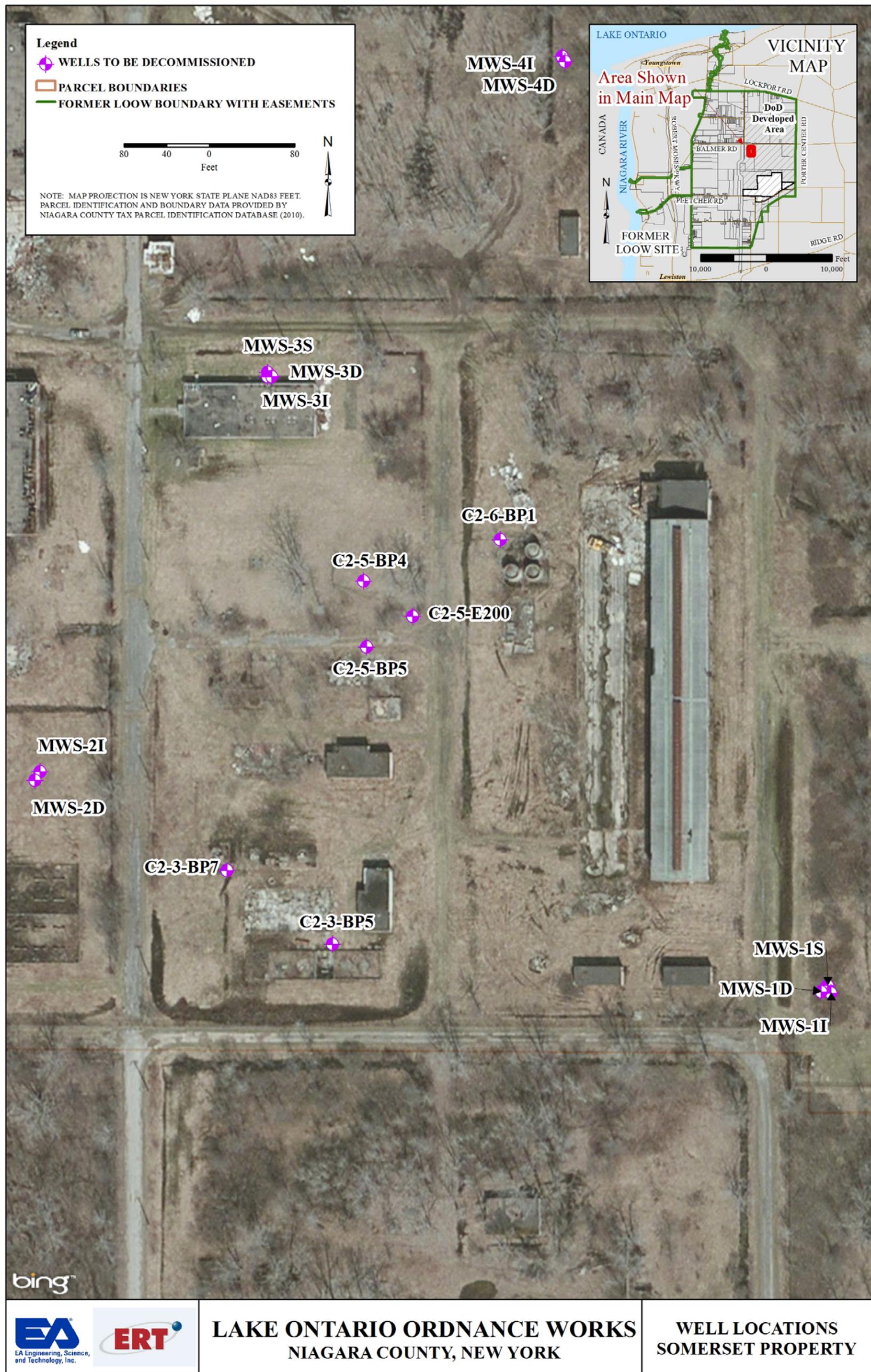


Figure 1-5: Somerset MW Locations Identified for Decommissioning

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## 2.0 PREPARATION

### 2.1 Compilation of Information

Prior to commencement of field activities related to the decommissioning, pertinent information regarding MW construction was reviewed and compiled. Pertinent MW information includes, but is not limited to, total depth, construction details, and global positioning system (GPS) coordinates. Following the compilation and review of information, a MW inspection was performed to verify construction details and the current condition of each MW identified for decommissioning.

The following MW details were verified during the information review and field inspection of each MW to be decommissioned:

- Is the well a single stem riser (all one diameter)?
- Is the well a simple overburden well (no penetration into bedrock)?
- Does the well riser consist of telescoping diameters of pipe which decrease with depth?
- Is the well seal compromised (leaking, inadequate or damaged)?
- If the well is polyvinyl chloride (PVC), is it 25 feet (ft) or shallower and not grouted into rock?
- Can the riser be pulled and is removal of the well desired?
- Is the well a bedrock well?
- If the MW is a bedrock well, does it have an open boring?
- Is there a well assembly (riser and screen) installed within the bedrock hole?
- Is the soil contaminated?
- Does the well penetrate a confining layer?
- If the well penetrates a confining layer, might over-drilling or pulling the casing cause contamination to travel up or down through a break in the confining layer?
- Does the screened interval cross multiple water-bearing zones?

### 2.2 Monitoring Well Inspections

In accordance with *CP-43: Groundwater Monitoring Well Decommission Policy* (NYSDEC, 2009), site reconnaissance was previously performed to confirm the location and condition of each MW to be decommissioned. *Monitoring Well Field Inspection Logs* are included as **Appendix A**.

### 2.3 MWs Selected for Decommissioning

**Table 2-1** presents a summary of the 24 MWs identified for decommissioning, including property owner and construction details. **Appendix B** includes a complete list of MWs at the site with their respective construction details and associated stratigraphy. **Appendix C** includes a photo log of all 56 MWs currently constructed at the site, compiled during the previous MW inspection activities.

**Table 2-1. Summary of Construction Details for MWs Identified for Decommissioning**

No.	Well ID	Property Owner	Total Depth (ft)	Screen Length (ft)	Well Type
1	MW-B-1S	CWM	22	10	Overburden
2	MW-B-1D	CWM	47	10	Overburden/Telescoping
3	MW-C-1S*	CWM	20	10	Overburden
4	MW-C-1D	CWM	39.5	8	Overburden/Telescoping
5	MW-C-2D*	CWM	34.5	10	Overburden/Telescoping
6	MW-C-3S	CWM	20	10	Overburden
7	MW-C-3D	CWM	34	8	Overburden/Telescoping
8	MW-D-1	CWM	35.5	10	Overburden/Telescoping
9	MWS-1S	Somerset	14	5	Overburden
10	MWS-1I	Somerset	35	5	Overburden
11	MWS-1D	Somerset	54	10	Overburden/Telescoping
12	MWS-2I	Somerset	49	12	Overburden
13	MWS-2D	Somerset	62	4.6	Overburden/Telescoping
14	MWS-3S	Somerset	10	5	Overburden
15	MWS-3I	Somerset	37	5	Overburden
16	MWS-3D	Somerset	66	20	Overburden/Telescoping
17	MWS-4I	Somerset	42	10	Overburden
18	MWS-4D	Somerset	56	5	Overburden
19	C2-3-BP5	Somerset	14	10	Overburden
20	C2-3-BP7	Somerset	20	10	Overburden
21	C2-5-BP4	Somerset	13	5	Overburden
22	C2-5-BP5	Somerset	12	8	Overburden
23	C2-5-E200	Somerset	13	5	Overburden
24	C2-6-BP1	Somerset	14.5	10	Overburden

**Legend:**

CWM = CWM Chemical Services, LLC

ft = feet

ID = identification

No. = number

Somerset = Somerset Group, Inc.

\* = monitoring well was unable to be located during field reconnaissance

### 3.0 METHODOLOGY

During decommissioning activities, the process train depicted in the *CP-43: Groundwater Monitoring Well Decommissioning Policy* (NYSDEC, 2009) will be followed. In accordance with *CP-43: Groundwater Monitoring Well Decommissioning Policy* (NYSDEC, 2009), criteria for selection of an appropriate decommissioning method include:

- geologic and hydrologic conditions at the site of the MW;
- presence or absence of contamination in the groundwater; and
- original well construction details.

The four primary NYSDEC-approved MW decommissioning methods include:

- Grouting in-place;
- Perforating the casing, followed by grouting in-place;
- Grouting in-place, followed by casing pulling; and
- Over-drilling and grouting, with or without a temporary casing.

Based on a review of the criteria for selecting appropriate decommissioning methods, review of MW construction details and the visual inspection of MW conditions, grouting in-place is the selected method of decommissioning MWs at the site. Should field conditions indicate another method is required for any of the identified MWs, CELRB will be consulted to determine the appropriate method of decommissioning.

Grouting in-place is the simplest and most frequently used MW decommissioning method, and grouting is an essential component of all decommissioning methods. Grout seals the borehole and any portion of the MW that is not removed (further discussed in Section 3.4). This method is specified for the decommissioning of small-diameter cased MWs, such as those identified at the site for decommissioning under this Work Plan.

Grouting in-place involves filling the casing with grout to a level of five ft below ground surface (bgs), cutting the MW casing at the five-ft depth, and removing the top portion of the casing and associated MW materials from the ground (e.g., stick up riser, protective casing, protective bollards and MW pad). The casing will be grouted according to the procedures provided in Section 3.4.4 of this Work Plan. In addition, the upper five ft of the borehole will be filled to the ground surface and restored using materials and procedures described in Section 3.5 of this Work Plan. If excessive grout is noted as being lost down-hole, grouting should be conducted in stages to reduce the pressure caused by the height of the grout column.

The well seal is defined as the bentonite seal above the sand pack in the annular space around the well. If the well seal is not compromised, and there is no confining layer present, a single-stem, 2-inch PVC MW can be satisfactorily decommissioned by grouting in-place. If the seal is compromised, casing perforation may be more applicable.

### 3.1 Selection Process and Implementation

For overburden MWs, the first factor in determining the decommissioning method is whether the overburden portion of the MW exhibits contamination, as determined through historical groundwater and/or soil sampling results. If the overburden is uncontaminated, the next criterion to consider is whether the MW penetrates a confining layer.

Of the 24 MWs identified for decommissioning, 8 MWs (MW-B-1D, MW-C-1D, MW-C-2D, MW-C-3D, MW-D-1, MWS-1D, MWS-2D and MWS-3D) penetrate a confining glaciolacustrine clay layer and 16 MWs (MW-B-1S, MW-C-1S, MW-C-3S, MWS-1S, MWS-1I, MWS-2I, MWS-3S, MWS-3I, MWS-4I, MWS-4D, C2-3-BP5, C2-3-BP7, C2-5-BP4, C2-5-BP5, C2-5-E200, and C2-6-BP1) do not penetrate a confining layer. At each of the 24 MWs identified for decommissioning, the casing will be tremie grouted and left in place. As a general rule, PVC wells greater than 25-feet deep should not be pulled unless site-specific conditions or other factors indicate that the MW can be pulled without breaking. If the MW cannot be pulled, the MW should be grouted in-place.

Prior to grouting, the depth of the well will be measured to determine if any silt or debris has plugged the well. If plugging has occurred, all reasonable attempts to clear it will be made before grouting. The borehole will then be tremie grouted (further detailed in Section 3.5) from the bottom of the well to the top of bedrock to ensure a continuous grout column.

### 3.2 Locating and Setting Up on Monitoring Wells

During the previous site reconnaissance, 22 of the 24 MWs to be decommissioned were located. Two MWs selected for decommissioning on the CWM property, MW-C-1S and MW-C-2D, could not be located during the site reconnaissance (**Figure 1-4**). These locations were likely previously buried under gravel, as a parking lot and equipment storage area currently exist at the locations where these MWs should exist based on their known GPS coordinates.

A subsurface investigation will be completed to locate MW-C-1S and MW-C-2D during decommissioning activities. A magnetometer (e.g., Schonstedt GA-52Cx) and/or light excavation equipment (e.g., rubber wheel back-hoe) will be utilized to locate and inspect the condition of these MWs. Once located, MW-C-1S and MW-C-2D will be decommissioned along with the other 22 MWs.

### 3.3 Removing the Protective Casing

All MWs identified for decommissioning at the site were completed as stick-up MWs and finished with an elevated, protective casing (steel guard pipe), and a concrete pad. For stick-up MWs, the riser pipe may be bonded to the guard pipe and/or concrete pad. When the protective casing and concrete pad of a stick-up MW are removed, a PVC riser will typically break off at the bottom of the guard pipe several ft bgs. Once this happens, it may become impossible to center a drill rig upon the well should an over-drilling method be required. The riser may become splintered and structurally unstable for pulling if attempted. Unless grouted first, the well may fill with dirt. Therefore, if it is determined based on field conditions that a MW requires case-pulling or over-drilling, each location will be grouted in-place before the additional MW decommissioning activities occur. This effort will ensure that the MW is properly sealed, regardless of potential problems later with removing the protective casing.

The specific procedure for removing the protective casing at each MW will depend on the casing construction and the selected decommissioning method. The variety of protective casings available precludes developing a universal removal procedure; however, it is preferred to simply break up the concrete seal surrounding the casing and jack or hoist the protective casing. Steel MW casings will be removed approximately five ft bgs, below the frost line and any subsequent shallow digging. Waste handling and disposal will be consistent with the methods and procedures outlined in Section 3.6 of this Work Plan.

### **3.4 Selecting Mixing and Placing Grout**

For each MW identified in **Table 2-1**, successful decommissioning depends on the proper grout mixture and placement in order to eliminate the potential for groundwater to travel within the volumes of the former MW and its boring. Grout mixtures will use Type 1 Portland cement and 4 percent bentonite by weight, as specified by the NYSDEC well decommissioning policy (NYSDEC, 2009).

#### **3.4.1 Standard Grout Mixture**

A standard grout mixture will be administered at MWs identified for decommissioning at the site. To produce a standard grout mixture with a bentonite content of 4 percent by weight, the mixture will be formulated according to the following recipe:

- One 94-pound bag of Type I Portland cement
- 3.9 pounds of powdered bentonite
- 7.8 gallons of potable water

None of the 24 MWs identified for decommissioning were constructed with screens that transect multiple groundwater zones. However, if a MW with this construction is encountered, more water may be used to penetrate the sand pack of the MW. A standard grout mixture will be used unless MW construction and/or subsurface conditions warrant use of a special grout mixture.

#### **3.4.2 Special Grout Mixture**

The boring logs and monitoring well construction information do not indicate that a special grout mixture will be required to prevent the loss of excessive amounts of grout. However, the well decommissioning contractor will be prepared to use a quick-setting grout mixture if a large amount of grout is lost to the subsurface during decommissioning with a standard grout mixture. To produce a special grout mixture with a bentonite content of 4 percent by weight, the mixture will be formulated according to the following recipe:

- One 94-pound bag of Type I Portland cement
- 3.9 pounds of powdered bentonite
- 1 pound calcium chloride
- 6.0 to 7.8 gallons of water (depending on desired thickness)

#### **3.4.3 Grout Mixing Procedure**

Prior to mixing, for either a standard or special grout mixture, the required volume of grout to fill the borehole will be calculated by the subcontractor performing the decommissioning. The grout will be mixed either manually or mechanically until a smooth, homogenous mixture is achieved.

### **3.4.4 Grout Placement**

Grout will be pumped into the MW from the bottom to the top by use of a tremie. The tremie will be a pipe, hose, or tube that extends from the grout supply to the bottom of the MW, to ensure the grout is delivered through the water column, without mixing with the water column. Each MW identified for decommissioning at the site is two inches or greater in diameter, and therefore, each MW will use a tremie of no less than one inch in diameter for grout placement. Grout will be pumped through the tremie from the bottom of the MW until the grout appears at grade.

Withdrawal of the tremie will occur during or after filling of the MW with grout. If groundwater that is suspected to be contaminated, based upon historic sampling results, is displaced during the grouting process, the groundwater will be containerized for characterization sampling and proper disposal. Based on historical information, it is not anticipated that contaminated water will be encountered. Non-contaminated groundwater will be discharged to the ground surface.

After grouting is complete, it will be monitored to determine if settling has occurred and if additional applications of grout are necessary. Should enough settling occur that the grout does not reach at least five ft bgs, more grout will be added. Grout will be added, as needed, as each section of down-hole tooling is removed in order to keep the level between zero and five ft bgs. Grout may also be placed in stages to allow for it to partially cure before adding additional grout. If the grout level drops excessively below grade, the selected grouting method will be reevaluated.

As previously described, where necessary, the outer protective stick-up portion of a well will be removed only after the well has been filled with grout, in order to ensure that the MW is properly sealed. If it is determined due to site conditions that casing pulling or over-drilling are required at any MW, the MW will first be grouted. Pulling or over-drilling should be performed before the grout is allowed to dry. The grout level at each location will be approximately five ft bgs. After decommissioning is complete, MW coordinates will be captured with a GPS unit. Additionally, ferrous metal marker and a fabricated utility marking will be installed at grade at all 24 wells following decommissioning for visibility and identification purposes.

### **3.5 Backfilling and Site Restoration**

During backfilling and restoration activities, the uppermost five ft at each MW location will be restored to grade with gravel, sand and/or native soils surrounding the decommissioned MW location. The ground surface at each location will be restored to the condition of the area surrounding the decommissioned MW. Surface materials, such as concrete and asphalt, will be patched with concrete or asphalt of the same type and thickness. Grassed areas will be seeded, and topsoil will be used in woody areas. All solid waste materials generated during the decommissioning process will be disposed of offsite.

### **3.6 Waste Management**

All waste generated during decommissioning activities will be collected for disposal offsite. Assumed debris to be generated from decommissioning activities includes protective stick-up casings, PVC MW casings, concrete MW pads, and protective bollards. All types and quantities of generated waste material will be documented.

Should investigative derived waste (IDW) be generated during well decommissioning activities, it will be placed in Department of Transportation approved 55-gallon steel drums. Each drum

containing IDW will be properly labeled according to the matrix, location, and date of generation as applicable. IDW will be sampled and analyzed prior to offsite disposal, as required by the receiving disposal facility. Staging of IDW will be in an area coordinated by CELRB. CELRB will be responsible for signing manifests and/or bills of lading associated offsite disposal of IDW drums.

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## 4.0 DOCUMENTATION

### 4.1 Field Documentation

The procedures and activities outlined above will be appropriately documented in accordance with *CP-43: Groundwater Monitoring Well Decommission Policy* (NYSDEC, 2009). Field observations and data collected at each location, including MW condition, selected decommissioning method, quantities of materials employed, restoration activities, and GPS coordinates will be compiled in a MW Decommissioning Close-out Report.

For each well a Monitoring Well Decommissioning Log (included in **Appendix D**) will be generated. For each day of decommissioning activities, a Daily Report will be generated by the Team Field Leader. For any problem identified or corrective measure implemented during field activities, the following records will be generated (included in **Appendix D**):

- Problem Identification Report
- Corrective Measures Report

### 4.2 Close-out Report

Upon completion of field activities, a MW Decommissioning Close-out Report will be prepared. At minimum, the close-out report will include the following information:

- list of the MWs decommissioned, their GPS coordinates, rationale for decommissioning, and MW-specific decommissioning method used;
- field measurements and field screening results;
- documentation of backfilling and site restoration activities;
- completed MW field inspection logs;
- completed MW decommissioning records;
- waste material inventory and any characterization results;
- discussion of waste material handling and disposal activities;
- final waste shipping documentation, and certificates of disposal and all waste manifests (if applicable);
- applicable State and Federal reporting forms;
- incident reports (if applicable); and
- quantity of all waste materials loaded, transported, and disposed of, included the method of transportation (if applicable).

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## 5.0 REFERENCES

- New York State Department of Environmental Conservation (NYSDEC), 2009. *CP-43: Groundwater Monitoring Well Decommissioning Policy*. November.
- U.S. Army Corps of Engineers (USACE), 1990. *PD-8 Final Remedial Investigation Report RI/FS Former Lake Ontario Ordnance Works Lewiston/Porter, Niagara County, New York*. August.
- USACE, 1992. *Preliminary Contamination Assessment Report Operable Unit No. 2 RI/FS Former Lake Ontario Ordnance Works Lewiston/Porter, Niagara County, New York*. December.
- USACE, 2002. *Report of the Results for the Phase II Remedial Investigation at the Lake Ontario Ordnance Works (LOOW) Niagara County, New York*. February.
- USACE, 2011. *Scope of Work for Environmental Engineering Support Former Lake Ontario Ordnance Works Site, Niagara County, New York*. August.

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## *Appendix A*

### *Monitoring Well Field Inspection Logs*

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# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 14:25

Well ID: C2-3-BP5

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... N

Surface seal competent? (Y/N) If damaged, describe below..... Y

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup, 1.5'

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 14

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No over

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: Located in grassy area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: Well located on north side of a building on the southern edge of the Somerset property. Large pieces of concrete in vicinity may make access with the rig difficult unless moved.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.): None observed.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 14:32

Well ID: C2-3-BP7

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... Y

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... 7

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below. .... Y

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup. 1

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 20

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No overhead

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required:     

Grassy area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary:     

Located on SE portion of somerset property, west of gravel road, near SE corner of foundation of old building. Soft ground at time of visit.

Possible rig access issues if wet weather.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None observed.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 14:15

Well ID: C2-5-BP4

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... Y

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... 4

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below..... Y

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 13

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No over

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: Located in a grassy area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: Located north of two small buildings, approx. 150 ft west of large warehouse-like building. Gravel road south of well. Potentially soft ground if wet.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.): None visible.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 14:10

Well ID: C2-5-BP5

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below..... Y

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 12

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No over

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required:     

Located in a grassy area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary:     

Located north of two small buildings, approx. 150 ft west of large warehouse-like building. Gravel road adjacent to well.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 14:19

Well ID: C2-5-E200

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... Y

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... 2

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below..... Y

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 13

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No over

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: Located in a grassy area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: Located north/northeast of two small buildings, approx. 150 ft west of large warehouse-like building. Gravel road just south of the well. Possible brush clearing required.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.): None visible.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 14:39

Well ID: C2-6-BP1

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below..... Y

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup. 2'

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 14.5

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No over

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: \_\_\_\_\_

Grassy area, topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: \_\_\_\_\_

Well located on north central portion of Somerset property. Approx. 25' east of a gravel road and 100' west of large warehouse-like building.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None observed.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 09:59

Well ID: MW-B-1D

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below..... N

Protective casing in good condition? (Y/N) If damaged, describe below. .... N

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... stickup

Protective casing material type ..... steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... Y

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 47

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 4

Well casing material ..... Sch 80 PVC

Physical condition of visible well casing..... N/A

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No overhead

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required:     

Located in a wooded area. Restore using surrounding native soil.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: Brush cutting required for rig to access well

location. Possibly cut down small tree.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Protective casing dented. Concrete seal cracked. Well was not opened during inspection (no PID, DTW, ID of protective casing)



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 09:58

Well ID: MW-B-1S

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below..... Y

Protective casing in good condition? (Y/N) If damaged, describe below. .... N

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... stickup

Protective casing material type ..... steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... N

Lock functional? (Y/N)..... N/A

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... N

Well depth (ft.)..... 17.7

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 4

Well casing material ..... Sch 80 PVC

Physical condition of visible well casing..... Poor

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No overhead

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: \_\_\_\_\_

Well is located in a wooded area. Restore area with surrounding native soil.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: Brush clearing required to access well location.

Possibly cut down a small tree.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Protective casing smashed and dented. Well was not opened during inspection (no PID, DTW, ID of protective casing)



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 10:38

Well ID: MW-C-1D

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... Y

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... MW-C-1D

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below. .... Y

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... stickup

Protective casing material type ..... steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 39.5

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 4

Well casing material ..... Sch 80 PVC

Physical condition of visible well casing..... N/A

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No overhead

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: Well located on a grassy area, adjacent to a gravel parking lot/equipment storage area. Restore using topsoil and grass seed.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: No access issues for rig.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.): None visible.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing)



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 10:35

Well ID: MW-C-1S

Well visible? (Y/N)..... N

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Unknown

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... N/A

Surface seal competent? (Y/N) If damaged, describe below. .... N/A

Protective casing in good condition? (Y/N) If damaged, describe below. .... N/A

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... N/A

Protective casing material type ..... N/A

Inner diameter of protective casing..... N/A

Lock present? (Y/N) ..... N/A

Lock functional? (Y/N)..... N/A

Did you replace lock? (Y/N)..... N/A

Evidence the well is double cased? (Y/N) If yes, describe below ..... N/A

Well measuring point visible? (Y/N)..... N/A

Well depth (ft.)..... 20 (in records)

Depth to water (ft.)..... N/A

Well diameter (in.) ..... 4

Well casing material ..... Sch 80 pvc

Physical condition of visible well casing..... N/A

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No overhead

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: \_\_\_\_\_

Well supposedly located in a gravel parking lot/equipment storage area. Restore using gravel moved to access well.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: No access restrictions.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None identified.

Comments: Well unable to be located, assumed buried under gravel for parking lot. Construction details pulled from records.



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 10:40

Well ID: MW-C-2D

Well visible? (Y/N)..... N

Well ID visible? (Y/N)..... N/A

Well location match site map? (Y/N) ..... N/A

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... N/A

Surface seal competent? (Y/N) If damaged, describe below. .... N/A

Protective casing in good condition? (Y/N) If damaged, describe below. .... N/A

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... N/A

Protective casing material type ..... N/A

Inner diameter of protective casing..... N/A

Lock present? (Y/N) ..... N/A

Lock functional? (Y/N)..... N/A

Did you replace lock? (Y/N)..... N/A

Evidence the well is double cased? (Y/N) If yes, describe below ..... N/A

Well measuring point visible? (Y/N)..... N/A

Well depth (ft.)..... 34.5

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 4

Well casing material ..... Sch 80 PVC

Physical condition of visible well casing..... N/A

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No Overhead

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: \_\_\_\_\_

Adjacent to gravel parking lot/equipment storage area. Restore using topsoil and grass seed.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: \_\_\_\_\_

No accessibility issues for rig.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Well assumed to be buried. Construction details taken from records.



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 10:26

Well ID: MW-C-3D

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... Y

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... MW-C-3D

Surface seal present? (Y/N) ..... N

Surface seal competent? (Y/N) If damaged, describe below. .... N/A

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... N/A

Well depth (ft.)..... 34

Depth to water (ft.)..... N/A

Well diameter (in.) ..... 4

Well casing material ..... Sch 80 PVC

Physical condition of visible well casing..... N/A

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No overhead

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: \_\_\_\_\_

Well located in a grassy area, adjacent to a gravel road. Topsoil and grass seed needed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: \_\_\_\_\_

Well located on a slope, no other obstructions for rig.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 10:26

Well ID: MW-C-3S

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... N

Surface seal competent? (Y/N) If damaged, describe below. .... N/A

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... N

Lock functional? (Y/N)..... N/A

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... N

Well depth (ft.)..... 20

Depth to water (ft.)..... N/A

Well diameter (in.) ..... 4

Well casing material ..... Sch 80 PVC

Physical condition of visible well casing..... Fair

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No overhead

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: \_\_\_\_\_

Located in grassy area adjacent to gravel road. Topsoil and grass seed needed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: \_\_\_\_\_

Well on a slope. Otherwise, no access issues.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None identified.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12,

Well ID: MW-D-1

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... Y

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... MW-D-1

Surface seal present? (Y/N) ..... N

Surface seal competent? (Y/N) If damaged, describe below. .... N/A

Protective casing in good condition? (Y/N) If damaged, describe below. .... N

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... N

Lock functional? (Y/N)..... N/A

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... Yes

Well measuring point visible? (Y/N)..... N

Well depth (ft.)..... 35.5

Depth to water (ft.)..... N/A

Well diameter (in.) ..... 4

Well casing material ..... Sch 80 PVC

Physical condition of visible well casing..... N/A

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No overhead

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: \_\_\_\_\_

Located adjacent to gravel road in grassy area. A large concrete block sits immediately adjacent to the well.

Restore using topsoil and grass seed.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: \_\_\_\_\_

Aside from concrete block possibly impeding decommissioning activities, no access issues.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Protective casing bent. Double casing visible. Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 13:38

Well ID: MWS-1D

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below..... Y

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... N/A

Well depth (ft.)..... 54

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... None

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: \_\_\_\_\_

Located in a rocky and grassy area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: \_\_\_\_\_

Well located on a mound, potentially soft, wet ground in the vicinity.

Brush clearing may be required for rig access. Located SE of large warehouse-like building, and east of two smaller buildings.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

\_\_\_\_\_

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 13:36

Well ID: MWS-11

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below. .... Y

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... N/A

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... N/A

Well depth (ft.)..... 35

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... None

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: \_\_\_\_\_

Located in a grassy and rocky area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: \_\_\_\_\_

Located SE of a large warehouse-type building, east of two smaller buildings. Well located on a mound.

Potentially soft, wet ground in the vicinity. Brush clearing may be required.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12,13:30

Well ID: MWS-1S

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... MWS-1S

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... N

Surface seal competent? (Y/N) If damaged, describe below. .... N/A

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... N/A

Well depth (ft.)..... 14

Depth to water (ft.)..... N/A

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... N/A

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... None

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: Located in rocky and grassy area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: Brush clearing may be required for rig access. Located SE of large warehouse-like building, and east of two smaller buildings.  
Well located on a mound, potentially soft, wet ground in vicinity.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.): None visible.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 13:53

Well ID: MWS-2D

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... N

Surface seal competent? (Y/N) If damaged, describe below. .... N/A

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... N/A

Well depth (ft.)..... 62

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No Over

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required:     

Located in a field. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary:     

Possible soft ground if wet. Well located west of gravel road. Drainage ditches surround it on three sides, and a fence on one side.

A crossing point exists over the ditches for a rig.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 13:50

Well ID: MWS-21

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... N

Surface seal competent? (Y/N) If damaged, describe below. .... N/A

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... N/A

Well depth (ft.)..... 49

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No Over

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required:     

Located in a field. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary:     

Possible soft ground if wet. Well located west of gravel road. Drainage ditches surround it on three sides, and a fence on one side.

A crossing point exists over the ditches for a rig.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 13:49

Well ID: MWS-3D

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below. .... N

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup, 2.4'

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 66

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... Overhead

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: \_\_\_\_\_

Located in a grassy area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: \_\_\_\_\_

Located just north of a building. Overhead lines in the vicinity exist, including a damaged, low-hanging line.

Possible underground utilities in the area.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Surface seal cracked and broken from heaving. Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 13:48

Well ID: MWS-3I

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below. .... N

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup, 2.5'

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 37

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... Overhead

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required:           

Located in a grassy area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary:           

Located just north of a building. Overhead lines in the vicinity exist, including a damaged, low-hanging line.

Possible underground utilities in the area.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Surface seal cracked and broken from heaving. Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 13:45

Well ID: MWS-3S

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below..... N

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup, 2.4'

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 10

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... Overhead

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required:     

Located in a grassy area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary:     

Located just north of a building. Overhead lines in the vicinity exist, including a damaged, low-hanging line.

Possible underground utilities in the area.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Surface seal cracked and broken from heaving. Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 13:57

Well ID: MWS-4D

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below..... Y

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 56

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No Over

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required:     

Located in a field/woody area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary:     

Well located approx. 100 feet north of a small building on northern part of Somerset property. Brush clearing likely required for rig access.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.):

None visible.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).



# Monitoring Well Field Inspection Form

Site ID: Former Lake Ontario Ordnance Works

Inspector: CELRB

Date and Time: 11/14/12, 13:55

Well ID: MWS-4I

Well visible? (Y/N)..... Y

Well ID visible? (Y/N)..... N

Well location match site map? (Y/N) ..... Y

Well ID as it appears on the well? ..... N/A

Surface seal present? (Y/N) ..... Y

Surface seal competent? (Y/N) If damaged, describe below..... Y

Protective casing in good condition? (Y/N) If damaged, describe below. .... Y

Headspace reading and instrument used ..... N/A

Type of protective casing and height of stickup, if applicable ..... Stickup

Protective casing material type ..... Steel

Inner diameter of protective casing..... Unknown

Lock present? (Y/N) ..... Y

Lock functional? (Y/N)..... Unknown

Did you replace lock? (Y/N)..... N

Evidence the well is double cased? (Y/N) If yes, describe below ..... N

Well measuring point visible? (Y/N)..... Unknown

Well depth (ft.)..... 42

Depth to water (ft.)..... Unknown

Well diameter (in.) ..... 2

Well casing material ..... Sch 40 PVC

Physical condition of visible well casing..... Unknown

Attach ID marker (if well ID is confirmed) and identify marker type.....

Proximity to underground or overhead utilities ..... No Over

Describe Well Setting (e.g. located in a field, parking lot, etc.) and type of restoration required: Located in a field/woody area. Topsoil and grass seed for restoration.

Describe access to well, include accessibility to rig, natural obstructions, overhead lines, permanent structures, etc.; add a sketch on back, if necessary: Well located approx. 100 feet north of a small building on northern part of Somerset property. Brush clearing likely required for rig access.

Identify any nearby potential sources of contamination, if present (e.g. gas station, salt pile, etc.): None visible.

Comments: Well was not opened during inspection (no PID, DTW, ID of protective casing).

## *Appendix B*

### *Table of Monitoring Wells at the former LOOW*

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LOOW Monitoring Wells

Monitoring Wells Installed by Acres

Well ID	Property Owner	Site	Location		Elevation (ft AMSL) <sup>(2)</sup>		Stick-up (ft ags)	Total Depth (ft bgs)	Well Screen or Intake			Annulus Backfill			Stratigraphy (depth to top of layer - ft bgs)						Construct Start Date	Construct End Date	Notes		
			Easting <sup>(4)</sup> (ft)	Northing <sup>(4)</sup> (ft)	Top of Casing <sup>(3)</sup>	Ground Surface			Depth (ft bgs)		Length (ft)	Elev (ft AMSL)		Depth (ft bgs)		Type	Upper Clay	Mid Silt Till	Lower Clay	Silt/Sand				Red Till	Bedrock
									Top	Bottom		Top	Bottom	Top	Bottom										
1	MW-A-1S	CWM	1044107.00	1176733.00	315.05	313.1	1.95	20	8.3	18.3	10	304.8	294.8	5 3	20 5	sand bentonite	15.8	---	---	---	---	---	1988	1988	#10 slot 4" dia screen, sch 80 pvc
2	MW-A-1D	CWM	1044096.00	1176733.00	315.02	313.1	1.92	39.1	27.2	37.2	10	285.9	275.9	25.2 21	39.1 25.2	sand bentonite	18	24.5	30	32.5	---	---	1988	1988	#10 slot 4" dia screen, sch 80 pvc 8" dia steel casing set into aquitard
3	MW-A-89	CWM	Area A	1043989.00	1176531.00	316.48	314.2	2.28	18	8	17	306.2	297.2	7 4	18 7	sand bentonite	---	---	---	---	---	---	12/13/1989	12/13/1989	#6 slot 2" dia screen, sch 304 SS
4	MW-B-1S	CWM	1043853.00	1176737.00	313.80	312.0	1.8	22	7.7	17.7	10	304.3	294.3	6 2.5	22 6	sand bentonite	17.4	---	---	---	---	---	1988	1988	#10 slot 4" dia screen, sch 80 pvc
5	MW-B-1D	CWM	1043846.00	1176730.00	314.60	312.8	1.8	47	34.9	44.9	10	277.9	267.9	32 30	34.9 32	sand bentonite	18.3	33.5	---	---	45	---	1988	1988	#10 slot 4" dia screen, sch 80 pvc 8" dia steel casing set into aquitard
6	MW-B-2S	CWM	1043533.00	1176814.00	311.83	310.2	1.63	15	5.8	14.8	9	304.4	295.4	3.4 0.5	15 3.4	sand bentonite	---	---	---	---	---	---	1988	1988	#10 slot 4" dia screen, sch 80 pvc
7	MW-B-2D	CWM	1043543.00	1176821.00	312.18	310.3	1.88	49.8	24.2	48	23.8	286.1	262.3	22.2 18.9	49.8 22.2	sand bentonite	14.4	20.3	---	29.5	---	49.4	1988	1988	#10 slot 4" dia screen, sch 80 pvc 8" dia steel casing set into aquitard
8	MW-B-3	CWM	1044048.00	1176476.00	316.41	314.7	1.71	18.0	7.5	17.5	10	307.2	297.2	4 1	18 4	sand bentonite	16.4	---	---	---	---	---	1988	1988	#10 slot 4" dia screen, sch 80 pvc
9	MW-B-4S	CWM	1043084.00	1176830.00	313.19	311.1	2.09	13.5	5	12	7	306.1	299.1	3 0.3	13.5 3	sand bentonite	---	---	---	---	---	---	1988	1988	#10 slot 4" dia screen, sch 80 pvc
10	MW-B-4D	CWM	1043096.00	1176833.00	313.16	311.4	1.76	54.9	27.1	53.1	26	284.3	258.3	22.5 18.3	54.9 22.5	sand bentonite	14.9	20.3	---	22.8	53	54.9	1988	1988	#10 slot 4" dia screen, sch 80 pvc 8" dia steel casing set into aquitard
11	MW-B-89	CWM	Area B	1043539.00	1176684.00	314.3	298.0	2.30	14	6.3	11.3	291.7	286.7	5.3 2.3	14 5	sand bentonite	---	---	---	---	---	---	12/12/1989	12/12/1989	#6 slot 2" dia screen, sch 304 SS
12	MW-C-1S	CWM	1044281.00	1175305.00	319.34	317.4	1.94	20	5.8	15.8	10	311.6	301.6	3.5 0.5	20 3.5	sand bentonite	15.2	---	---	---	---	---	1988	1988	#10 slot 4" dia screen, sch 80 pvc
13	MW-C-1D	CWM	1044293.00	1175310.00	319.13	317.3	1.83	39.5	30	38	8	287.3	279.3	27.9 22.8	39.5 27.9	sand bentonite	13.8	---	---	27.3	37.3	39.5	1988	1988	#10 slot 4" dia screen, sch 80 pvc 8" dia steel casing set into aquitard
14	MW-C-2D	CWM	1044131.00	1175305.00	315.50	312.9	2.6	34.5	22.9	32.9	10	290	280	21 19	34.5 21	sand bentonite	10	---	---	22.5	33.5	35	1988	1988	#10 slot 4" dia screen, sch 80 pvc 8" dia steel casing set into aquitard
15	MW-C-3S	CWM	1043640.00	1175631.00	313.17	311.5	1.67	20	5.8	15.8	10	305.7	295.7	3.5 0.5	20 3.5	sand bentonite	15.2	---	---	---	---	---	1988	1988	#10 slot 4" dia screen, sch 80 pvc
16	MW-C-3D	CWM	1043653.00	1175633.00	314.10	311.7	2.4	34.0	21	29	8	290.7	282.7	18.5 15.5	34 18.5	sand bentonite	15.5	23.4	24	16	28.7	34	1988	1988	#10 slot 4" dia screen, sch 80 pvc 8" dia steel casing set into aquitard
17	MW-D-1	CWM	1043440.00	1175450.00	315.23	313.5	1.73	35.5	23	33	10	290.5	280.5	21 8	35.5 21	sand bentonite	7	10	14.9	21.3	31.8	35.5	1988	1988	#10 slot 4" dia screen, sch 80 pvc
18	MWS-1S	Somerset	1042013.00	1176011.00	316	313.3	2.7	14	3.8	8.8	5	309.5	304.5	2.7 1	9.7 2.7	sand bentonite	---	---	---	---	---	---	11/22/1991	11/22/1991	#10 slot 2" dia screen, sch 40 pvc
19	MWS-1I	Somerset	AFP-68	1042016.00	1176004.00	315.9	313.3	2.6	35	29.4	34.4	283.9	278.9	27.2 25.4	35 27.2	sand bentonite	---	---	---	---	---	---	12/13/1991	12/17/1991	#10 slot 2" dia screen, sch 40 pvc
20	MWS-1D	Somerset	AFP-68	1042007.00	1176005.00	316.2	313.3	2.9	54	39	49	274.3	264.3	37 35	50.7 37	sand bentonite	18	28.5	34.8	37.5	50.7	---	11/25/1991	12/4/1991	#10 slot 2" dia screen, sch 40 pvc
21	MWS-2I	Somerset	AFP-68	1041275.00	1176212.00	313.8	310.8	3	49	34.5	46.5	276.3	264.3	32.1 30	47 32.1	sand bentonite	18.1	31.6	---	---	---	---	12/11/1991	12/13/1991	#10 slot 2" dia screen, sch 40 pvc
22	MWS-2D	Somerset	AFP-68	1041270.00	1176204.00	313.4	310.8	2.6	62	54.9	59.5	255.9	251.3	52.2 50.1	61 52.2	sand bentonite	18.1	31.5	48.5	52.3	60.8	---	12/5/1991	12/13/1991	#10 slot 2" dia screen, sch 40 pvc
23	MWS-3S	Somerset	AFP-68	1041488.00	1176587.00	312.8	310.4	2.4	10	5	10	305.4	300.4	3.9 2	10 3.9	sand bentonite	---	---	---	---	---	---	12/27/1991	12/27/1991	#10 slot 2" dia screen, sch 40 pvc
24	MWS-3I	Somerset	AFP-68	1041488.00	1176583.00	312.9	310.4	2.5	37	30	35	280.4	275.4	28 25	35 28	sand bentonite	22	29.5	36	---	---	---	12/27/1991	12/31/1991	#10 slot 2" dia screen, sch 40 pvc
25	MWS-3D	Somerset	AFP-68	1041492.00	1176583.00	312.8	310.4	2.4	66	42.2	62.2	268.2	248.2	40.2 37.6	63.5 40.2	sand bentonite	23.5	31.5	35.6	39.1	64	---	12/17/1991	12/31/1991	#10 slot 2" dia screen, sch 40 pvc
26	MWS-4I	Somerset	AFP-68	1041764.00	1176884.00	312.2	309.2	3	42	29.6	39.6	279.6	269.6	27.6 25.7	40 27.6	sand bentonite	23.2	31.5	40.4	---	---	---	1/6/1992	1/9/1992	#10 slot 2" dia screen, sch 40 pvc
27	MWS-4D	Somerset	AFP-68	1041767.00	1176879.00	312.2	309.2	3	56	50	55	259.2	254.2	48.3 46.3	56 48.3	sand bentonite	23.2	31.5	45.5	48.9	53.3	---	1/3/1992	1/9/1992	#10 slot 2" dia screen, sch 40 pvc

**LOOW Monitoring Wells**

**Monitoring Wells Installed by EA Engineering Science**

Well ID	Property Owner	Site	Location		Elevation (ft AMSL) <sup>(5)</sup>		Stick-up (ft ags) <sup>(3)</sup>	Total Depth (ft bgs)	Well Screen or Intake			Annulus Backfill			Stratigraphy (depth to top of layer - ft bgs)						Construct Start Date	Construct End Date	Notes			
			Easting <sup>(4)</sup> (ft)	Northing <sup>(4)</sup> (ft)	Top of Casing <sup>(3)</sup>	Ground Surface			Depth (ft bgs)		Length (ft)	Elev (ft AMSL)		Depth (ft bgs)		Type	Upper Clay	Mid Silt Till	Lower Clay	Silt/Sand				Red Till	Bedrock	
									Top	Bottom		Top	Bottom	Top	Bottom											
28	BKGD-7A	DoD (YLTA)	background	1045328	1180787	309.59	308.59	1	20	9	19	10	299.59	289.59	7 4	20 7	sand bentonite	---	---	---	---	---	---	12/12/2000	12/12/2000	#20 slot 2" dia screen, sch 40 pvc
29	BKGD-8B	DoD (YLTA)	background	1046253	1179072	313.51	310.51	3	13	4	12	8	306.51	298.51	2 1	13 2	sand bentonite	---	---	---	---	---	---	12/11/2000	12/11/2000	#20 slot 2" dia screen, sch 40 pvc
30	BKGD-9A	CWM	background	1048202	1175240	Not shown in well completion log	Not shown in well completion log	2	21	10	20	10			8 6	21 8	sand bentonite	---	---	---	---	---	---	12/11/2000	12/11/2000	#20 slot 2" dia screen, sch 40 pvc
31	BKGD-18	CWM	background	1048189	1173808	Not shown in well completion log	Not shown in well completion log	1	20	9	19	10			7 5	20 7	sand bentonite	---	---	---	---	---	---	12/13/2000	12/13/2000	#20 slot 2" dia screen, sch 40 pvc
32	C1-20-BP1	CWM	Area C20	1041903	1175003	316.93	314.93	2	15	4.6	14.6	10	310.33	300.33	2.6 1.6	15 2.6	sand bentonite	---	---	---	---	---	---	11/28/2000	11/28/2000	#20 slot 2" dia screen, sch 40 pvc
33	C1-20-BP2	CWM	Area C20	1041926	1174970	316.64	314.24	2.4	14.6	4	14	10	310.24	300.24	2 1	14.6 2	sand bentonite	---	---	---	---	---	---	11/28/2000	11/28/2000	#20 slot 2" dia screen, sch 40 pvc
34	C1-20-BP3	CWM	Area C20	1041900	1174895	317.28	314.78	2.5	12.5	2.5	12.5	10	312.28	302.28	2 1	12.5 2	sand bentonite	---	---	---	---	---	---	11/28/2000	11/28/2000	#20 slot 2" dia screen, sch 40 pvc
35	C1-20-BP4	CWM	Area C20	1042028	1174931	316.96	313.96	3	15	4.5	14.5	10	309.46	299.46	2.5 1.5	15 2.5	sand bentonite	---	---	---	---	---	---	11/28/2000	11/28/2000	#20 slot 2" dia screen, sch 40 pvc
36	C1-2-A100BP2	CWM	Area C2	1041519	1175043	316.4	314.4	2	18.5	8	18	10	306.4	296.4	5 3	18.5 5	sand bentonite	---	---	---	---	---	---	11/29/2000	11/29/2000	#20 slot 2" dia screen, sch 40 pvc
37	C1-2-A100BP3	CWM	Area C2	1041430	1175056	316.06	313.56	2.5	13.5	4	13	9	309.56	300.56	3 2	13.5 8	sand bentonite	---	---	---	---	---	---	11/30/2000	11/30/2000	#20 slot 2" dia screen, sch 40 pvc
38	C1-2-A100BP4	CWM	Area C2	1041437	1174892	316.69	314.19	2.5	15.5	4.7	14.7	10	309.49	299.49	2.8 1.5	15.5 2.8	sand bentonite	---	---	---	---	---	---	11/30/2000	11/30/2000	#20 slot 2" dia screen, sch 40 pvc
39	C1-2-A100BP5	CWM	Area C2	1041657	1174918	316.21	313.71	2.5	17.5	6	16	10	307.71	297.71	3.5 2	17.5 3.5	sand bentonite	---	---	---	---	---	---	11/30/2000	12/1/2000	#20 slot 2" dia screen, sch 40 pvc
40	C1-2-A100BP6	CWM	Area C2	1041424	1174970	315.9	313.9	2	18.5	8	18	10	305.9	295.9	6 4.7	18.5 6	sand bentonite	---	---	---	---	---	---	12/1/2000	12/1/2000	#20 slot 2" dia screen, sch 40 pvc
41	C1-2-BP1	CWM	Area C2	1041608	1174727	316.88	314.88	2	18.5	8	18	10	306.88	296.88	5.5 3.25	18.5 5.5	sand bentonite	---	---	---	---	---	---	11/29/2000	11/29/2000	#20 slot 2" dia screen, sch 40 pvc
42	C1-NH-BP3	CWM	Nitration House	1042198	1175033	318.28	315.88	2.4	13	7	12	5	308.88	303.88	5 3	13 5	sand bentonite	---	---	---	---	---	---	8/8/2000	8/8/2000	#20 slot 2" dia screen, sch 40 pvc
43	C1-NH-BP5	CWM	Nitration House	1042201	1175085	318.02	316.02	2	13	7	12	5	309.02	304.02	5 3	13 5	sand bentonite	---	---	---	---	---	---	8/9/2000	8/9/2000	#20 slot 2" dia screen, sch 40 pvc
44	C1-NH-BP6	CWM	Nitration House	1042156	1175082	320.32	318.32	2	19	8	18	10	310.32	300.32	5 3	19 5	sand bentonite	---	---	---	---	---	---	8/9/2000	8/9/2000	#20 slot 2" dia screen, sch 40 pvc
45	C2-3-BP5	Somerset	Area C3	1041549	1176050	312.73	311.23	1.5	14	3	13	10	308.23	298.23	1.5 0.5	14 1.5	sand bentonite	---	---	---	---	---	---	11/7/2000	11/7/2000	#20 slot 2" dia screen, sch 40 pvc
46	C2-3-BP7	Somerset	Area C3	1041450	1176119	312.11	311.11	1	20	9	19	10	302.11	292.11	7 5	20 7	sand bentonite	---	---	---	---	---	---	11/27/2000	11/27/2000	#20 slot 2" dia screen, sch 40 pvc
47	C2-5-BP4	Somerset	Area C5	1041578	1176391	311.87	309.87	2	13	7	12	5	302.87	297.87	5 3	13 5	sand bentonite	---	---	---	---	---	---	8/9/2000	8/9/2000	#20 slot 2" dia screen, sch 40 pvc
48	C2-5-BP5	Somerset	Area C5	1041581	1176329	312.93	309.93	3	12	4	12	8	305.93	297.93	2 1	12 2	sand bentonite	---	---	---	---	---	---	11/7/2000	11/7/2000	#20 slot 2" dia screen, sch 40 pvc
49	C2-5-E200	Somerset	Area C5	1041624	1176358	312.65	310.65	2	13	7	12	5	303.65	298.65	5 3	13 5	sand bentonite	---	---	---	---	---	---	8/9/2000	8/9/2000	#20 slot 2" dia screen, sch 40 pvc
50	C2-6-BP1	Somerset	Area C6	1041706	1176430	313.25	311.25	2	14.5	4.5	14.5	10	306.75	296.75	2.5 1.5	14.5 2.5	sand bentonite	---	---	---	---	---	---	11/6/2000	11/6/2000	#20 slot 2" dia screen, sch 40 pvc
51	C3-VS-BP4	NFSS (USACE)	Vicinity Shops	1040167	1173411	317.34	315.34	2	19	8	18	10	307.34	297.34	5 3	19 5	sand bentonite	---	---	---	---	---	---	8/8/2000	8/8/2000	#20 slot 2" dia screen, sch 40 pvc
52	C3-VS-BP5	NFSS (USACE)	Vicinity Shops	1040101	1173399	317.78	315.38	2.4	19	8	18	10	307.38	297.38	5 3	19 5	sand bentonite	---	---	---	---	---	---	8/8/2000	8/8/2000	#20 slot 2" dia screen, sch 40 pvc
53	C3-VS-G100	NFSS (USACE)	Vicinity Shops	1040166	1173320	318.26	316.26	2	19	8	18	10	308.26	298.26	5 3	19 5	sand bentonite	---	---	---	---	---	---	8/7/2000	8/7/2000	#20 slot 2" dia screen, sch 40 pvc

**Monitoring Wells Installed by ERT**

Well ID	Property Owner	Site	Location		Elevation (ft AMSL) <sup>(5)</sup>		Stick-up (ft ags) <sup>(3)</sup>	Total Depth (ft bgs)	Well Screen or Intake			Annulus Backfill			Stratigraphy (depth to top of layer - ft bgs)						Construct Start Date	Construct End Date	Notes			
			Easting <sup>(4)</sup> (ft)	Northing <sup>(4)</sup> (ft)	Top of Casing <sup>(3,6)</sup>	Ground Surface <sup>(6)</sup>			Depth (ft bgs)		Length (ft)	Elev (ft AMSL)		Depth (ft bgs)		Type	Upper Clay	Mid Silt Till	Lower Clay	Silt/Sand				Red Till	Bedrock	
									Top	Bottom		Top	Bottom	Top	Bottom											
54	C3-WWTP-BP14	Town Lewiston	WWTP	1040324.164	1173990.994	317.06	315.56	1.5	22.5	12	22	10			10 8	22.5 10	sand bentonite	---	---	---	---	---	---	10/22/2009	10/22/2009	#10 slot 2" dia screen, sch 40 pvc
55	C3-WWTP-BP15	Town Lewiston	WWTP	1040301.627	1173862.405	319.54	318.39	1.15	23	12	22	10.0			10 8	23 10	sand bentonite	---	---	---	---	---	---	10/22/2009	10/22/2009	#10 slot 2" dia screen, sch 40 pvc
56	C3-WWTP-BP16	Town Lewiston	WWTP	1040201.628	1173863.759	320.06	318.71	1.35	23	12	22	10			10 8	23 10	sand bentonite	---	---	---	---	---	---	10/22/2009	10/22/2009	#10 slot 2" dia screen, sch 40 pvc

**Notes:**

- 1 CWM grid system (Ref. Acres Table 5-1, 1990)
- 2 CWM datum (Ref. Acres Table 5-1, 1990)
- 3 Top of PVC Riser
- 4 NYS NAD 83
- 5 NY NAVD 88
- 6 Data acquired via GPS and is accurate to within 1 foot

## *Appendix C*

### *Photo Log of Monitoring Wells at the former LOOW*

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**Photograph 1. MW-B-3**



**Photograph 2. MW-A-89**



**Photograph 3. MW-A-1D**



**Photograph 4. MW-A-1S**



**Photograph 5. MW-B-1D\***



**Photograph 6. MW-B-1S\***



**Photograph 7. MW-B-89**



**Photograph 8. MW-B-2D**



**Photograph 9. MW-B-2S**



**Photograph 10. MW-B-4D**



**Photograph 11. MW-B-4S**



**Photograph 12. MW-C-3D\***



**Photograph 13. MW-C-3S\***



**Photograph 14. MW-D-1\***

Unable to locate well.

**Photograph 15. MW-C-2D\***



**Photograph 16. MW-C-1D\***

Unable to locate well.

**Photograph 17. MW-C-1S\***



**Photograph 18. C1-NH-BP3**



**Photograph 19. C1-NH-BP5**



**Photograph 20. C1-NH-BP6**



**Photograph 21. C1-20-BP1**



**Photograph 22. C1-20-BP2**



**Photograph 23. C1-20-BP3**



**Photograph 24. C1-20-BP4**



**Photograph 25. C1-2-A100BP5**



**Photograph 26. C1-2-A100BP2**



**Photograph 27. C1-2-A100BP3**



**Photograph 28. C1-2-A100BP4**



**Photograph 29. C1-2-A100BP6**



**Photograph 30. BKGD-9A**



**Photograph 31. BKGD-18**



**Photograph 32. C3-WWTP-BP14**



**Photograph 33. C3-WWTP-BP15**



**Photograph 34. C3-WWTP-BP16**



**Photograph 35. C3-VS-BP4**



**Photograph 36. C3-VS-BP-5**



**Photograph 37. C3-VS-G100**



**Photograph 38. BKGD-7A**



**Photograph 39. BKGD-8B**



**Photograph 40. MWS-4I\***



**Photograph 41. MWS-4D\***



**Photograph 42. MWS-3S\***



**Photograph 43. MWS-3I\***



**Photograph 44. MWS-3D\***



**Photograph 45. C2-6-BP1\***



**Photograph 46. C2-5-BP4\***



**Photograph 47. C2-5-E200\***



**Photograph 48. C2-3-BP5\***



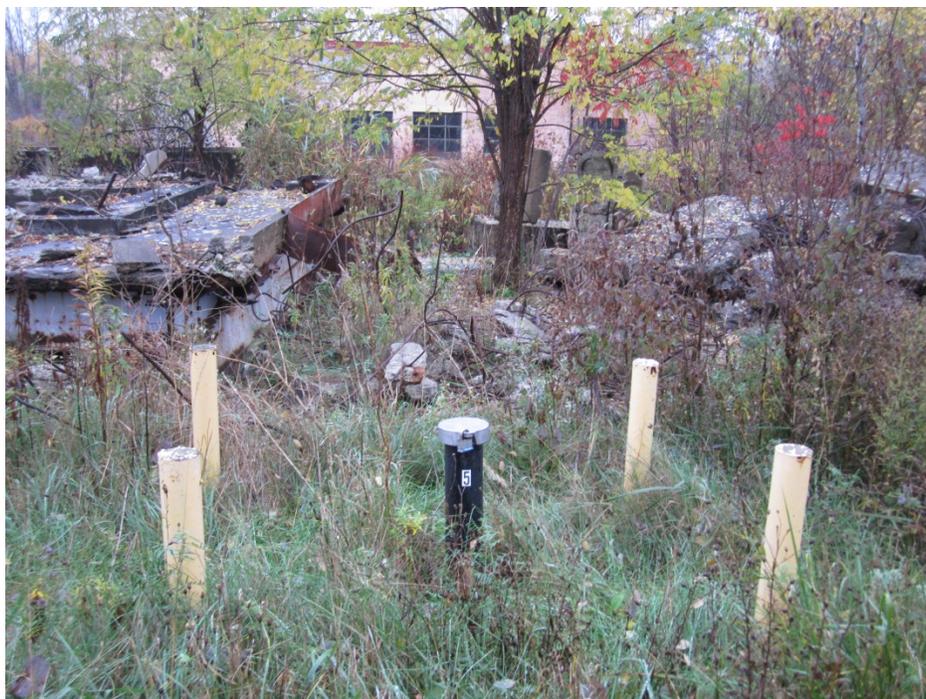
**Photograph 49. MWS-2I\***



**Photograph 50. MWS-2D\***



**Photograph 51. C2-3-BP7\***



**Photograph 52. C2-5-BP5\***



**Photograph 53. MWS-1S\***



**Photograph 54. MWS-1D\***



**Photograph 55. MWS-11\***



**Photograph 56. C1-2-BP1**

*Note: \* = Well selected for decommissioning*

## *Appendix D*

### *Field Forms*

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# Monitoring Well Decommissioning Log

Site Name:	Well I.D.:
Site Location:	Driller:
Drilling Co.:	Inspector:

Date: \_\_\_\_\_

Decommissioning Data  
(Fill in all that apply)

### Well Schematic

*Sketch in all relevant decommissioning data: interval overdrilled, interval grouted, casing left in hole, stickup height, etc.*

#### Overdrilling

Interval drilled \_\_\_\_\_

Drilling method(s) \_\_\_\_\_

Borehole Dia. (in.) \_\_\_\_\_

Temporary casing installed? \_\_\_\_\_

Depth temp. casing installed? \_\_\_\_\_

Casing type/dia. (in.) \_\_\_\_\_

Method of installation \_\_\_\_\_

#### Casing Pulling

Method employed \_\_\_\_\_

Casing retrieved (ft.) \_\_\_\_\_

Casing type/dia. (in.) \_\_\_\_\_

#### Casing Perforating

Equipment used \_\_\_\_\_

Number of perforations/ft \_\_\_\_\_

Size of perforations \_\_\_\_\_

Interval perforated \_\_\_\_\_

#### Grouting

Interval grouted (FBLS) \_\_\_\_\_

# of batches prepared \_\_\_\_\_

For each batch record:

Qty. of water used (gal.) \_\_\_\_\_

Qty. of cement used (lbs.) \_\_\_\_\_

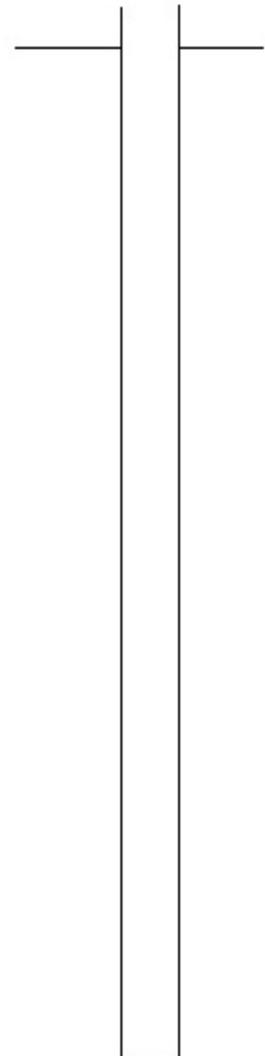
Cement type \_\_\_\_\_

Qty. of bentonite used (lbs.) \_\_\_\_\_

Qty. of calcium chloride used (lbs.) \_\_\_\_\_

Vol. of grout prepared (gal.) \_\_\_\_\_

Vol. of grout used (gal.) \_\_\_\_\_



Comments: \_\_\_\_\_

Signature - Driller

License #

Date

# PROBLEM IDENTIFICATION REPORT

Date \_\_\_\_\_

Project \_\_\_\_\_ Job Number \_\_\_\_\_

Contractor \_\_\_\_\_

Subject \_\_\_\_\_

Day 

Su	M	T	W	Th	F	Sa
----	---	---	---	----	---	----

Sky/Precip.	Clear	Partly Cloudy	Cloudy	Rainy	Snow
TEMP.	<32F	32-40F	40-70F	70-80F	80-90F
WIND	No	Light	Strong		
HUMIDITY	Dry	Mod.	Humid		

<b>PROBLEM DESCRIPTION</b> Reference Daily Report Number 1: _____     
<b>PROBLEM LOCATION - REFERENCE TEST RESULTS AND LOCATION</b> (Note: Use sketches on back of form as appropriate):      
<b>PROBABLE CAUSES:</b> _____     
<b>SUGGESTED CORRECTIVE MEASURES:</b> _____     
<b>APPROVALS:</b>  <b>QA ENGINEER:</b> _____   <b>PROJECT MANAGER:</b> _____

- Distribution:**
1. Project Manager
  2. Field Office
  3. File
  4. Owner

**QA Personnel**  
**Signature:** \_\_\_\_\_



# CORRECTIVE MEASURES REPORT

Date \_\_\_\_\_

Project \_\_\_\_\_ Job Number \_\_\_\_\_

Contractor \_\_\_\_\_

Subject \_\_\_\_\_

Day	Su	M	T	W	Th	F	Sa
-----	----	---	---	---	----	---	----

Sky/Precip.	Clear	Partly Cloudy	Cloudy	Rainy	Snow
TEMP.	<32F	32-40F	40-70F	70-80F	80-90F
WIND	No	Light	Strong		
HUMIDITY	Dry	Mod.	Humid		

**CORRECTIVE MEASURES TAKEN (Reference Problem Identification Report No.):** \_\_\_\_\_

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**RETESTING LOCATION:** \_\_\_\_\_

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**SUGGESTED METHOD OF MINIMIZING RE-OCCURRENCE:** \_\_\_\_\_

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---

**SUGGESTED CORRECTIVE MEASURES:** \_\_\_\_\_

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**APPROVALS:**

**QA ENGINEER:** \_\_\_\_\_

**PROJECT MANAGER:** \_\_\_\_\_

- Distribution:**
1. Project Manager
  2. Field Office
  3. File
  4. Owner

**QA Personnel Signature:** \_\_\_\_\_