CENAB-EN-HN

U.S. Army Corps of Engineers
Baltimore District

Interim Removal Action
Component 1 - Phases 2 and 3
Areas A and B
Former Lake Ontario Ordnance Works
Lewiston and Porter
Niagara County, New York

Long-Term Monitoring Plan

Supplement to the 60% Design

Contract Number DACA31-96-D-0006
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Prepared for:

U.S. ARMY CORPS OF ENGINEERS
Baltimore District
10 South Howard Street
Baltimore, Maryland 21201

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INTERIM REMOVAL ACTION
COMPONENT 1—PHASES 2 and 3
AREAS A and B
FORMER LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER
NIAGARA COUNTY, NEW YORK

LONG-TERM MONITORING PLAN

SUPPLEMENT TO THE 60% DESIGN

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LIST OF ACRONYMS

ACM	asbestos-containing material
AFP-68	Air Force Plant 68
CENAB	U.S. Army Corps of Engineers Baltimore District
Chem-Trol	Chem-Trol Pollution Services, Inc.
cm	centimeter
DAR	Design Analysis Report
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
EE/CA	engineering evaluation/cost analysis
IRA	Interim Removal Action
LOOW	Lake Ontario Ordnance Works
LTM	long-term monitoring
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health Administration
PRAC	Preplaced Remedial Action Contract
PRDI	Preliminary Remedial Design Investigation
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RI/FS	remedial investigation/feasibility study
SAP	Sampling and Analysis Plan
SCA	SCA Chemical Services, Inc.
SSHP	Site Safety and Health Plan
TCL	Target Compound List
TSD	treatment, storage, and disposal
USACE	U.S. Army Corps of Engineers
WESTON	Roy F. Weston, Inc.

1. INTRODUCTION

1.1 PROJECT DESCRIPTION

The U.S. Army Corps of Engineers Baltimore District (CENAB) has retained Roy F. Weston, Inc. (WESTON®) to develop the Remedial Design for Interim Removal Actions (IRAs) for Components 1, 2, and 3 (Chemical Waste Management [CWM] property, Somerset Group [Somerset] property, and Town of Lewiston property) at the former Lake Ontario Ordnance Works (LOOW) located in Niagara County, New York.

A meeting was held on 16 April 1998 to discuss the new phasing of the Interim Removal Action (IRA) due to funding constraints that resulted in further division of the remedial design according to the new phasing. In attendance were representatives from CENAB and WESTON. At the meeting it was announced that, in order to expedite the remediation using the currently available funds, the IRA will be performed in five separate phases. The first two phases include the removal of loose asbestos-containing materials and miscellaneous chemicals from the Somerset Property. The designs for these first two phases have been completed. The additional three phases include the TNT Pipeline and Chemical Waste Sewer (Phase 1, Component 1), Area A (Phase 2), and Area B (Phase 3). The work for the three phases of Component 1 will be performed under the Preplaced Remedial Action Contract (PRAC). This is a cost-plus contract that can be performed with an incomplete design. Field decisions are made on issues that have not been completely finalized in the design. CENAB directed WESTON to revise the previously submitted supplement to the 60% Design (dated January 1998) to conform with this new phasing and address comments on this previous submittal. A revised supplement to the 60% Design for Phase 1 of Component 1 was submitted to CENAB in August 1998. The August 1998 design submittal did not include Areas A and B (Phases 2 and 3) in accordance with the new IRA phasing.

This submittal of the Long-Term Monitoring (LTM) Plan, therefore, is part of the Supplement to the 60% Design for Phases 2 and 3 of Component 1, which supersedes the September 1997 LTM Plan and addresses the comments received on the September 1997 60% Design.

This submittal of the LTM Plan includes the areas that will be remediated under Phases 2 and 3 of Component 1 (CWM property) of the IRA, which includes remediation of Areas A and B.

1.2 OBJECTIVE AND SCOPE

The purpose of the LTM Plan is to ensure that there are no long-term adverse effects to the environment following the implementation of the remedial action.

The scope of the LTM Plan consists of the following activities:

- Biannual groundwater level measurements and collection and analysis of groundwater samples from existing monitor wells in Areas A and B. Samples will be analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and pesticides. The results will be transmitted to CENAB on a biannual basis.
- Review of results of the current groundwater monitoring program at the LOOW.
- Biannual post-remediation inspection of Areas A and B, chemical lift stations (on CWM property), former chemical waste sewer line (on CWM property), and TNT pipeline. Maintenance activities will be performed, as necessary, based on the results of the inspections.

1.3 GENERAL SITE BACKGROUND AND AREAS OF CONCERN

1.3.1 General Background

The former LOOW site is located within the Town of Lewiston and the Town of Porter in Niagara County, New York (Figure 1-1). The site is located approximately 10 miles north of the City of Niagara Falls, New York.

The original site encompassed approximately 7,500 acres with actual U.S. Department of Defense (DOD) site activities having occurred on 2,500 acres. During the early 1940s, the LOOW site was used as a manufacturing plant producing TNT for use in World War II. Once completed, the complex contained a power plant, hospital, fire department, a water supply system adequate for a population of 100,000, and water supply and wastewater treatment system of underground water, sewage, acid, and TNT pipelines.

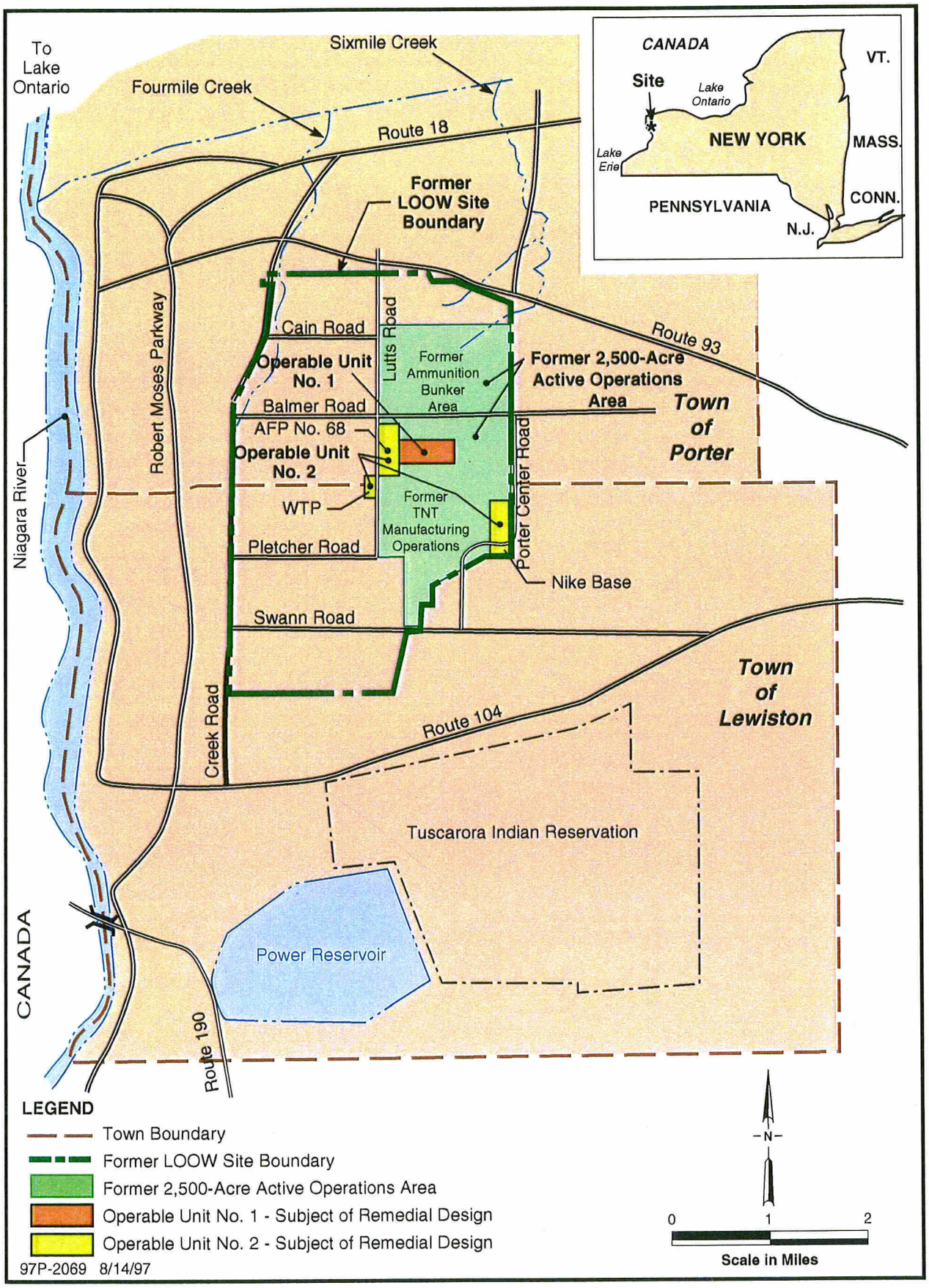


FIGURE 1-1 LOOW LOCATION MAP

Wastewater from the TNT manufacturing operation, as well as stormwater and sanitary sewage, was transferred through an underground sewer network to a wastewater treatment plant located in the western portion of the TNT plant. The TNT pipelines ran as one pair of east-west trending lines across the TNT production area before being routed south to the wastewater treatment plant at the west end of the production line. Following the decommissioning of the TNT plant in July 1943, the majority of the LOOW facility was sold to private citizens, with the government retaining the former active 2,500-acre portion of the site.

Portions of the LOOW site have since been used by several branches of DOD and the U.S. Department of Energy (DOE) for various manufacturing and storage activities, including the pilot production of high-energy fuels. In 1955, the Navy and Air Force acquired 360 and 200 acres, respectively, of the former TNT plant.

In 1972, Chem-Trol Pollution Services, Inc. (Chem-Trol) acquired portions of LOOW for the development of a hazardous waste treatment, storage, and disposal (TSD) facility. Chem-Trol was acquired by SCA Chemical Services, Inc. (SCA) in 1973, and was subsequently acquired by CWM in the early 1980s. In 1969, Somerset obtained an approximate 100-acre section of the former LOOW property that contained Air Force Plant 68 (AFP-68). Around 1979, the southern half of the former AFP-68 (about 50 acres) was sold to SCA. This section is currently owned by CWM. The portions of the former TNT and AFP-68 site specifically addressed by the PRDI are situated on property currently owned by CWM and the Town of Lewiston. CWM operates the site as a Resource Conservation and Recovery Act (RCRA) TSD facility. The portion of the site owned by the Town of Lewiston is currently unused.

The focus of the Preliminary Remedial Design Investigation (PRDI) was the sampling of the TNT pipelines (Figure 1-2) and two chemical lift stations (Area 22 and Area 24) of the former chemical waste sewer line, which are all located within the CWM property. A portion of the former chemical waste sewer line and one lift station are located on the Somerset property. A portion of the TNT pipelines located within the former wastewater treatment plant is owned by the Town of Lewiston.

An investigation of asbestos-containing materials was conducted at the northern portion of the former AFP-68 in January 1998.

1.3.2 Areas of Concern

The remedial investigation/feasibility study (RI/FS), engineering evaluation/cost analysis (EE/CA), PRDI Report, and Preliminary Design Analysis Report (DAR) for the LOOW site identified areas for non-time-critical removal actions for Components 1, 2, and 3 (Figures 1-1 and 1-2). The areas to be included in Component 1, Phases 2 and 3 of the Phase I IRA are listed below:

- Component 1 (CWM Property)
  - Area A—Buried drum trench.
  - Area B—Burn pit area (including depression area).

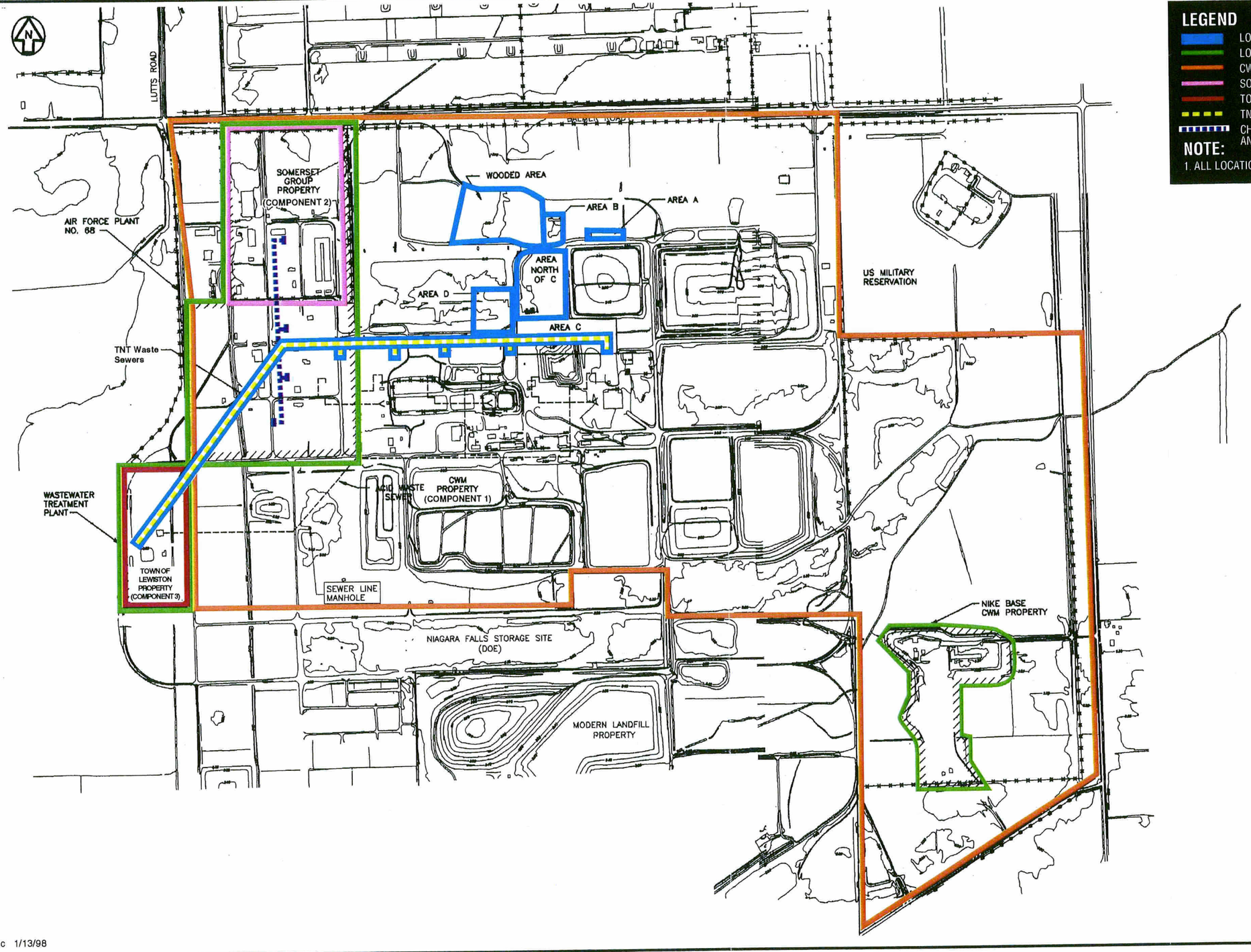
1.4 PROJECT SCHEDULE

LTM activities will be conducted on a biannual basis (i.e., two times per year). A summary report of activities conducted, which will include data and other findings, will be submitted to CENAB one time per year, no later than 3 months after the second monitoring event for that year. Following the first year, the results of the confirmation sampling from the IRM and the data from the LTM will be evaluated to determine if continued LTM activities are necessary.

1.5 DOCUMENT OUTLINE

This document has been organized as follows:

- Section 1—Introduction
- Section 2—Post-Remediation Monitoring Procedures
- Section 3—Sampling and Analysis Plan
- Section 4—Site Safety and Health Plan



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ACRES

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FIGURE 1-2 LOOW STUDY AREA LOCATION MAP

2. POST-REMEDIATION MONITORING PROCEDURES

2.1 BASIS FOR EVALUATION OF POTENTIAL MONITORING ACTIVITIES

This subsection presents a brief summary of the removal actions to be performed at LOOW to provide a basis for evaluating the need for LTM activities.

Areas A and B are located southeast of the intersection of Balmer Road and Lutts Road within OU No. 1 on the former LOOW site. The portion of Area A designated for removal actions is a trench with buried drums estimated at 220 ft long by 40 ft wide by 10 ft deep. The portions of Area B designated for removal actions includes a burn pit (formerly ponded area) and a surface depression (approximate dimensions of 100 ft long by 25 ft wide by 18 ft deep).

The removal action planned for Areas A and B is the removal and disposal of drums (Area A), pond water and sediments (Area B), contaminated berm material (Area B) and soils, and associated contaminated groundwater from within the areas/trench. Because confirmation sampling will be performed to ensure that cleanup levels are met and the excavated materials will be transported off-site for disposal at a permitted facility, the need for long-term monitoring is very limited; however, sampling and analysis of groundwater from monitor wells in the vicinity of the area will be conducted to ensure that there are no post-remediation impacts to groundwater.

The excavated areas will then be filled with clean fill, which will be graded to match adjacent topography and prevent ponding of surface water. An appropriate seed and mulch will be placed over the disturbed area. Upon germination and establishment of the vegetation, site erosion controls will be removed. Post-remediation inspections, and maintenance, if necessary, will be conducted to ensure that the new vegetation in the area remains intact and that no erosion or ponding occurs.

2.2 MONITORING ACTIVITIES

There are several activities that will be maintained throughout the post-remediation period. These activities are discussed in the following subsections and consist of:

- Collection and analysis of groundwater samples from existing monitor wells in Areas A and B to be conducted two times per year. Samples will be analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and pesticides. The results will be transmitted to CENAB on a biannual basis.

- Review of results of the current groundwater monitoring program at the LOOW.

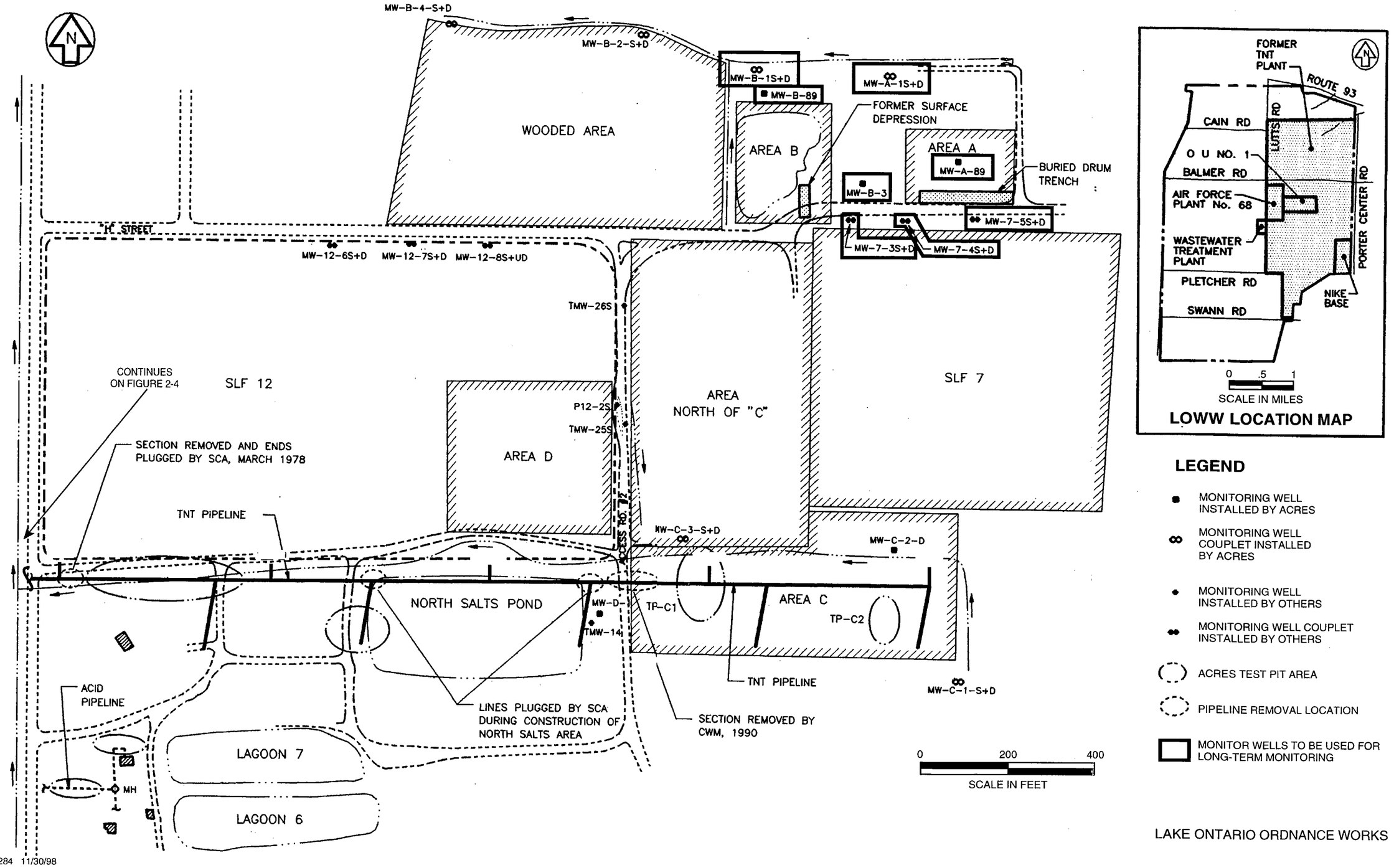
- Post-remediation inspection of Areas A and B, to be conducted two times per year (at the same time as the groundwater sampling). Maintenance activities will be performed, as necessary, based on the results of the inspections.

A sampling and analysis plan (SAP) and a site safety and health plan (SSHP) must be prepared prior to implementation of any LTM activities.

2.2.1 Water Quality Monitoring and Review of Data from Current Groundwater Monitoring

Water quality monitoring (including depth to water measurements) for Areas A and B will be performed two times per year throughout the designated post-remediation period. Groundwater samples will be collected from the existing monitor wells shown in Figure 2-1. Groundwater sampling and analysis will be undertaken, in accordance with the Sampling and Analysis Plan (SAP), to be submitted to CENAB for approval. The existing monitor wells will be inspected prior to sampling to verify that they will produce representative samples. In addition, the sampling of these wells will be coordinated with CWM's sampling of the wells to minimize cost and to provide consistency with CWM's historic data.

A summary of the constituents detected in subsurface soils in Area A is provided in Table 2-1. Table 2-2 presents the constituents detected in buried drums and test pit water in Area A. Constituents detected in soils and sediments in Area B are presented in Table 2-3. Maximum concentrations are presented in Tables 2-1, 2-2, and 2-3 based on the results presented in the Final March 1995 Engineering Evaluation/Cost Analysis (EE/CA). Tables 2-4 and 2-5 provide a summary of compounds detected in groundwater samples collected in monitor wells near Area B (EE/CA, 1995).



LOWW LOCATION MAP

LEGEND

- MONITORING WELL INSTALLED BY ACRES
- MONITORING WELL COUPLET INSTALLED BY ACRES
- MONITORING WELL INSTALLED BY OTHERS
- MONITORING WELL COUPLET INSTALLED BY OTHERS
- ACRES TEST PIT AREA
- PIPELINE REMOVAL LOCATION
- MONITOR WELLS TO BE USED FOR LONG-TERM MONITORING

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FIGURE 2-1 MONITOR WELL LOCATIONS AT AREAS A AND B

Table 2-1

Area A Constituents of Concern Detected in Subsurface Soils

Constituent	Maximum Concentration (mg/kg)
Volatile Organics	
Acetone	**.99**
1,2-Dichloroethene	0.012J
Benzene	0.011J
Toluene	0.150
Ethylbenzene	0.010J
Styrene	0.009J
Total Xylenes	0.046
Semivolatiles	
Phenol	**.086J**
4-Chloroaniline	.150J
2-Methylnaphthalene	.360J
Diethylphthalate	.052J
Pesticides/PCBs	
delta-BHC	**0.50**
Metals	
Arsenic	**10**
Barium	130
Boron	86.8
Chromium	**19**
Lead	16
Lithium	107
Nickel	**22**
Zinc	**71**

MDL = Method Detection Limit
J = Detected concentration is below the Contract Required Quantification Limit.

Table 2-2

Summary of Constituents Detected in Buried Drums and Test Pit Water in Area A

Constituent	Maximum Concentration Detected in Drum Samples (mg/kg)	Maximum Concentration Detected in Test Pit Water (µg/L)
Volatile Organics		
Vinyl Chloride	ND	12
Acetone	4.6E	1600E
1,1,-Dichloroethane	0.005J	31
1,2-Dichloroethene (Total)	0.012	110
Methylene Chloride	ND	ND
2-Butanone	0.079	130
Trichloroethene	0.001J	11
Benzene	0.010	32
cis-1,3-Dichloropropene	ND	7J
4-Methyl-2-Pentanone	ND	6J
Tetrachloroethene	0.003J	0.8J
Toluene	0.170	260E
Ethylbenzene	0.018	4J
Styrene	0.007	7J
Total Xylenes	0.033	16
Semivolatiles		
Phenol	ND	97
2-Methylphenol	ND	26
4-Methylphenol	ND	64
2,4-Dichlorophenol	ND	7J
Naphthalene	0.086J	25
2-Methylnaphthalene	0.370J	29
Acenaphthylene	0.009J	ND
Acenapthene	0.041J	ND
Diethylphthalate	0.100J	ND
N-Nitrosodiphenylamine (1)	0.330J	ND
Phenanthrene	1.500	5J

Table 2-2

Summary of Constituents Detected in Buried Drums and Test Pit Water in Area A (Continued)

Constituent	Maximum Concentration Detected in Drum Samples (mg/kg)	Maximum Concentration Detected in Test Pit Water (µg/L)
Anthracene	0.045J	ND
Fluoranthene	0.054J	ND
Di-n-Butylphthalate	ND	1J
Pyrene	0.300J	0.4J
Chrysene	0.054J	ND
Pesticides/PCBs		
delta-BHC	ND	ND
Heptachlor epoxide	0.002J	ND
Endosulfan I	0.029	ND
4,4'-DDE	0.019J	ND
4,4'-DDT	ND	ND
Metals		**(mg/L)**
Total Arsenic	19	0.012
Total Barium	110	0.14
Total Beryllium	0.63	ND
Total Boron	ND	120
Total Chromium	22	ND
Total Copper	44	0.015
Total Iron	46,690	7.7
Total Lead	21	0.010
Total Lithium	67	38
Total Nickel	21	0.16
Total Potassium	3,570	5.0
Total Silver	1.1	ND
Total Sodium	ND	65
Total Zinc	75	0.34

J = The detected concentration is below the Contract Required Quantification Limit (CRQL).
E = Compounds whose concentrations exceed the calibrated range of the GC/MS instrument for that specific analysis.
ND = Not detected.

Table 2-3

Area B Constituents of Concern

Constituent	Maximum Concentration (mg/kg)
Area B - Zone 1	
Volatile Organics	
Methylene Chloride	**6.5**
Benzene	**0.27**
Chlorobenzene	**1.8**
Ethylbenzene	**7.3**
Styrene	4.8
Total Xylenes	0.31
Semivolatile Organics	
1,2,4-Trichlorobenzene	0.35
1,4-Dichlorobenzene	5.9
2-Methylnapthalene	3.5
Pesticides	
Aldrin	**0.041**
alpha-BHC	**1.2**
Dieldrin	**0.93**
Heptachlor epoxide	**0.039**
Metals	
Arsenic	1.3
Barium	120
Boron	558.0
Chromium	**24**
Copper	**35**
Lithium	1,150.0
Lead	29
Mercury	**0.21**
Nickel	**16**
Zinc	**220**

Table 2-3

Area B Constituents of Concern (Continued)

Constituent	Maximum Concentration (mg/kg)
Area B - Zone 2	
Volatile Organics	
Acetone	**0.8**
Carbon Tetrachloride	**4.5**
Tetrachloroethene	**11**
Carbon Disulfide	0.026
Chloroform	0.110
Semivolatile Organics	
Hexachloroethane	9.0
Naphthalene	0.19J
2-Methylnaphthalene	0.58
Phenanthrene	0.53J
Metals	
Boron	84.9
Lithium	39.1

J = Detected concentration is below the Contract Required Quantification Limit (CRQL).

Table 2-4

Example Summary of Compounds Detected in CWM Wells Near Area B

Well I.D.	Date	Compound	Concentration (µg/L)
MW-7-3S	8/86	Carbon Tetrachloride	275
	8/86	Chloroform	463
	8/86	Methylene Chloride	844
	11/86	Carbon Tetrachloride	234
	11/86	Chloroform	382
	11/86	Methylene Chloride	22.9
	11/86	Toluene	58.8
	3/98	Carbon Tetrachloride	208
	3/87	Chloroform	249
	3/87	Methylene Chloride	16.0

Table 2-5

Analytical Results - Area B
Groundwater Samples
Acres, 1988

	MW-B-1S	MW-B-1D	MW-B-3
Organics (µg/kg)			
Chloroform	2J	-	1J
Bis(2-ethylhexyl)phthalate	-	2J	-
delta-BHC	-	0.005J	-
Metals (mg/L)			
Total Arsenic	0.080	0.0095	-
Total Barium	0.62	0.065	0.23
Total Boron	-	-	11
Total Chromium	0.12	-	-
Total Copper	0.21	0.012	0.006
Total Iron	140	3.2	0.36
Total Lead	0.042	0.046	-
Total Lithium	0.22	0.12	26
Total Manganese	-	-	-
Total Mercury	-	-	0.0007
Total Nickel	0.16	-	-
Total Potassium	19	14	13
Total Sodium	36	150	43
Total Zinc	0.42	0.13	0.037

Notes:

No data entry indicates compound not detected.

J indicates compound present, but below quantitation limit.

Based on the results of the first two rounds and the confirmation soil results, the list of analytical tests for particular monitor wells may be reduced or monitoring activities may cease upon agreement from CENAB.

The results will be compared to current New York regulations and guidance, consisting of the following: Table 1 of 6NYCRR Part 703.5 (Surface Water and Groundwater Quality Standards and Groundwater Effluent Standards) and NYS TOGs (Ambient Water Quality Standards and Guidance Values), or other criteria approved by CENAB. The data will also be compared to the results of ongoing groundwater monitoring at LOOW (not part of this plan); the results of the ongoing monitoring will be provided by CENAB. A report consisting of the Areas A and B groundwater data, a summary of the evaluation of results, and a review of ongoing monitoring data will be prepared in a letter report format and will be submitted to CENAB in accordance with Subsection 1.4 of this LTM Plan.

2.2.2 Sampling and Depth to Water Measurements of Shallow Groundwater Monitor Wells

Groundwater sampling will be conducted as follows:

- The area around the well will be scanned with an organic vapor analyzer (OVA), as specified in the SAP. The external air measurements will be recorded in the logbook. Downhole and ambient air quality will be monitored with an OVA, as specified in the Site Safety and Health Plan (SSHP), to adjust the level of personal protection, if necessary.
- The following well measurements will be recorded in the notebook (or as otherwise specified in the SAP):
  - Well identification and location (at the time of each sampling).
  - Well integrity.
  - Elevation of casing above mean sea level.
  - Downhole and ambient air reading detected with an OVA (at the time of each sampling).
  - Depth to water (ft) from top of casing (at the time of each sampling). Water level measurements will be taken to the nearest 0.01 ft with respect to the established

survey point on top of the well casing. All measuring devices used in the well will be washed with laboratory-grade detergent solution and thoroughly rinsed with distilled water prior to reuse. The depth to the top of the water will be subtracted from the total casing depth to determine the height and, subsequently, the volume of standing water in the casing.

- Total depth of well and depth to top of sediment layer, if present (ft).
- Total volume of standing water in the well.

- A minimum of three well volumes of water will be evacuated from the wells using a bailer, Johnson-Keck pump (or equivalent), or dedicated pump. The wells will be purged to dryness and sampled within 24 hours, as discussed below. If the well recharges fast enough during purging so that the water level is not drawn down or drawdown is slow, the pump intake will be placed just below the water level and lowered as needed. This will ensure that the water near the top of casing that will be sampled by the bailer is replaced. The volume of water removed and the elapsed time of purging will be recorded. The purge water will be containerized and disposed of appropriately, as specified in the SAP.

- If the well is evacuated completely during pumping or bailing and is not recovering at a sufficient rate (within 2 hr), the well will be sampled after purging one well volume. The recharge rates of all wells will be estimated and recorded in the field notebook.

- For each volume of water purged from a well, a groundwater sample will be collected for field testing of the pH, temperature, specific conductance, and turbidity, using the procedures described in the SAP.

- The well will be sampled after turbidity has stabilized and at least three well volumes have been purged or as discussed in above step about non-recovering wells.

- A decontaminated (as specified in ASTM D 5088-90), teflon, bottom-filling bailer will be used to obtain the sample. The bailer will be lowered into the well using a polyethylene cord. After the bailer is filled, the bailer will be retrieved, but not allowed to touch the ground. The bottles designated for volatile analysis will be filled first. These bottles should be free of air bubbles after filling and sealing. The remaining bottles may be filled in any order. The bailing process will be repeated until all sample bottles are filled.

- The bottles will be sealed and labeled. All pertinent information (color, odor, sheen, etc.) will be recorded in the field notebook.

- Field quality assurance/quality control (QA/QC) samples will be collected, as discussed in the SAP.

- Samples will be packed and shipped as environmental samples, as discussed in the SAP.

- The sampling and filtering equipment will be decontaminated, as needed, between wells to prevent cross-contamination, as detailed in the SAP.

2.2.3 Post-Remediation Inspections

Post-remediation inspections will be conducted for the purpose of monitoring site conditions and determining the need for maintenance activities at the site. A site inspection report will be completed after each inspection and will be maintained on file. The report will note the condition of the site and will identify areas of the site that may require additional maintenance work. The reports will be submitted with the groundwater monitoring report.

Post-remediation inspections will include, at a minimum, the following:

- Note condition of new vegetation in the remediated areas (damaged, stressed, sparse areas, intact, etc.).
- Note any soil settlement, erosion, or ponding.
- Note any weathering or damage to reconstructed roads/gravel areas.
- Note condition of fences, signs, gates, and locks, as applicable.

Maintenance activities (such as regrading, revegetation, or repairing areas disturbed by erosion, weathering, or vandalism), if deemed necessary, will be recommended in the inspection reports and will be conducted following approval by CENAB.

3. SAMPLING AND ANALYSIS PLAN

The LTM activities for Areas A and B (Component 1, Phases 2 and 3) will be conducted in accordance with the procedures in this LTM Plan, as well as those presented in the Sampling and Analysis Plan (SAP). The SAP provides the sampling protocols, sample handling, analytical methods, and related quality assurance/quality control (QA/QC) requirements, data reporting, and presentation associated with the above field activities. The SAP, which will be submitted to CENAB for approval, will be prepared by the Contractor who will be performing the LTM activity. The SAP will be prepared in accordance with *Requirements for the Preparation of Sampling and Analysis Plans,* USACE, EM 200-1-3, September 1994 (or most current edition); *Chemical Data Quality Management for Hazardous, Toxic, and Radioactive Waste Remedial Activities*, USACE, ER 1110-1-263, April 1996 (or most current edition); and *Hazardous, Toxic and Radioactive Waste Guidance for Civil Works Projects,* USACE, ER 1165-2-132, June 1992; or other document(s), as approved by CENAB.

The SAP will include, as a minimum, the following to cover all LTM activities, including work by subcontractors:

- A description of the QC organization, including a chart showing lines of authority.
- The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a project QA/QC function.
- Procedures for scheduling, reviewing, and managing documentation and submittals.
- Control, verification, and acceptance testing/laboratory procedures for each specific test/analysis to include the name and description of analysis, test frequency, and person responsible for each test. (Laboratory facilities will be approved by CENAB.)
- Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests, including documentation.
- Procedures for tracking deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.
- Reporting procedures, including proposed reporting formats.

- A description of work to be done.
- Data deliverable.
- Handling of investigative-derived waste (including purge water).

The following document may be used as a reference, where applicable, in preparation of the SAP: *Preliminary Remedial Design Investigation, Former Lake Ontario Ordnance Works, Lewiston and Porter, Niagara County, New York, Sampling and Analysis Plan*, prepared by WESTON for CENAB, October 1996. In addition, the approved CWM Chemical Services SAP should be reviewed.

4. SITE SAFETY AND HEALTH PLAN

The LTM activities for Areas A and B (Component 1, Phases 2 and 3) will be conducted in accordance with the procedures and protocols in the Site Safety and Health Plan (SSHP). The SSHP will be prepared by the Contractor who will be performing the LTM and will be submitted to CENAB for approval. The SSHP must comply with the following: *Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste Activities,* USACE, Department of the Army, ER 385-1-92, 18 March 1994 (or most current edition) and EM 385-1-1, 3 September 1996; USACE *Safety and Health Requirements Manual;* and applicable federal, state, and local safety and occupational health laws and regulations (including, but not limited to, Occupational Safety and Health Administration [OSHA] Standards, 29 CFR 1910, especially Section .120, *Hazardous Waste Site Operations and Emergency Response* and 29 CFR 1926, especially Section .65, *Hazardous Waste Site Operations and Emergency Response*).

The SSHP will cover on-site work to be performed by the Contractor and all subcontractors. The Contractor's Safety and Health Manager will be responsible for the development, implementation, and oversight of the SSHP. The SSHP will establish, in detail, the protocols necessary for the anticipation, recognition, evaluation, and control of hazards associated with each task performed as part of the LTM activities. The SSHP will address site-specific safety and health requirements and procedures based on site-specific conditions. The level of detail provided in the SSHP will be tailored to the type of work, complexity of operations to be performed, and hazards anticipated.

The following document may be used as a reference where appropriate: *Preliminary Remedial Design Investigation, Former Lake Ontario Ordnance Works, Lewiston and Porter, Niagara County, New York, Site Safety and Health Plan,* prepared by WESTON for CENAB, October 1996.