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

**Phase I Interim Removal Action
Components 1, 2, and 3
Former Lake Ontario Ordnance Works
Lewiston and Porter
Niagara County, New York**

Draft 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
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**PHASE I INTERIM REMOVAL ACTION
COMPONENTS 1, 2, AND 3
FORMER LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER
NIAGARA COUNTY, NEW YORK**

LONG-TERM MONITORING PLAN

SUPPLEMENT TO THE 60% DESIGN

Prepared for

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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
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 4 December 1997 to discuss the comments of the 60% Design and the status of the IRA funding. In attendance were representatives from CENAB, U.S. Army Corps of Engineers (USACE) New York District, New York State Department of Environmental Conservation (NYSDEC), and WESTON. At the meeting it was announced that in order to expedite the remediation using the currently available funds for this type of work, the work 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 address the technical issues discussed during this meeting in a Supplement to the 60% Design.

Therefore, this submittal of the Long-Term Monitoring (LTM) Plan is part of the Supplement to the 60% Design and addresses the comments received from CENAB on the 60% Design and the issues discussed at the 4 December 1977 meeting.

Due to current funding constraints it was proposed, at the 4 December 1977 meeting, that the remediation of Area A and Area B be postponed for subsequent phases of the IRA. Therefore, the remediation to be performed as part of the Phase I of the IRA under PRAC will include the TNT pipeline, chemical waste sewer, and the miscellaneous chemicals and loose asbestos on the Somerset property. The Supplement to the 60% Design submittal, including this submittal of the LTM Plan, shall exclude Area A and Area B for this phase of the IRA. The design submittals for Area A and Area B will be addressed when these subsequent phases are funded.

This submittal of the LTM Plan includes the areas under Component 1 (CWM property), Component 2 (Somerset property), and Component 3 (Town of Lewiston property) that will be remediated under the Phase I of the IRA. Although previous submittals of the LTM Plan for the IRA at LOOW were provided in separate documents for each of the components, this submittal combines the areas under these components into one single document.

1.2 OBJECTIVE AND SCOPE

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

The scope of the LTM Plan consists of evaluation of the results of the post-IRA samples to determine if LTM may be necessary.

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.

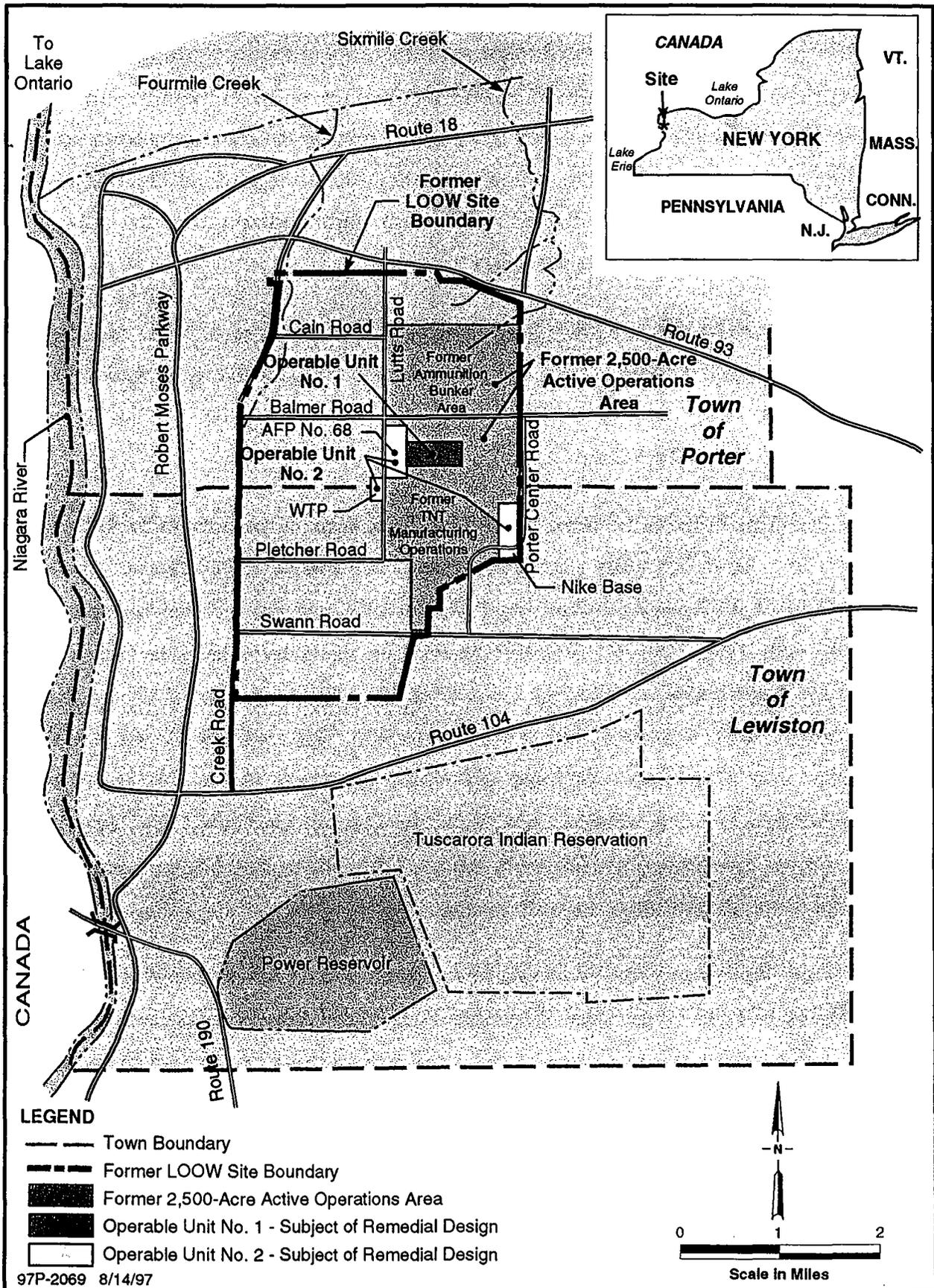


FIGURE 1-1 LOOW LOCATION MAP

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.

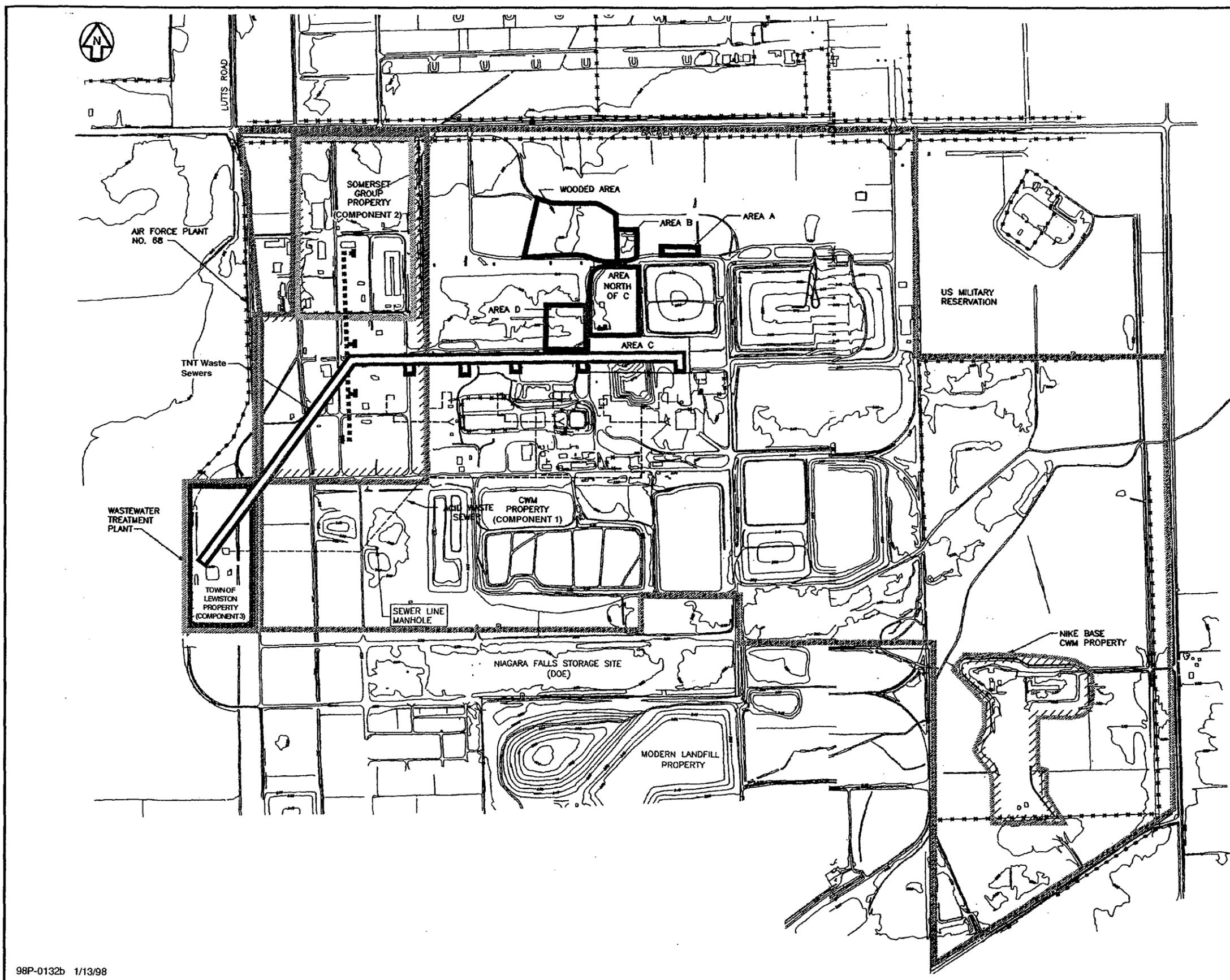
In 1972, Chem-Trol Pollution Services, Inc. (Chem-Trol) acquired portions of LOOW for the development of a hazardous waste treatment, storage, and disposal (TSD) facility. Chem-Trol was acquired by SCA Chemical Services, Inc. (SCA) in 1973, and was subsequently acquired by CWM in the early 1980s. In 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.

LEGEND

- LOOW RI/FS OPERABLE UNIT NO. 1
- LOOW RI/FS OPERABLE UNIT NO. 2
- CWM PROPERTY (COMPONENT 1)
- SOMERSET PROPERTY (COMPONENT 2)
- TOWN OF LEWISTON PROPERTY (COMPONENT 3)
- TNT WASTE PIPELINE
- CHEMICAL WASTE SEWER SYSTEM AND LIFT STATIONS

NOTE:
1. ALL LOCATIONS ARE APPROXIMATE.



LAKE ONTARIO ORDNANCE WORKS



FIGURE 1-2 LOOW STUDY AREA LOCATION MAP

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 the Phase I IRA are listed below:

- Component 1 (CWM Property)
 - Portions of the TNT pipelines.
 - Portions of the chemical waste sewer system sludges.
- Component 2 (Somerset Property)
 - Portions of the chemical waste sewer system sewage and sludges.
 - Loose asbestos-containing material (ACM).
 - Miscellaneous containers of liquids and oils.
- Component 3 (Town of Lewiston)
 - Portions of the TNT pipelines.

The removal actions related to the loose ACM and miscellaneous containers of hazardous liquids and oils do not require LTM activities since the materials of concern will be permanently removed from LOOW, and there are no activities that require post-remediation inspection (i.e., the ground will not be disturbed, etc.).

1.4 PROJECT SCHEDULE

Following issuance of the IRA report and completion of the risk assessment, the results of the post-IRA samples will be evaluated to determine the need for LTM activities. If performed, 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.

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

2. POST-REMEDATION 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.

The chemical waste sewer system located on both the CWM (Component 1) and Somerset (Component 2) properties consisting of the chemical waste lift stations (typically 10 ft by 10 ft by 10.5 ft) in Areas 4, 7, 8, 22, and 31, and adjacent to the oil/water separator in Area 24 North, and associated interconnecting sewer lines, are designated for removal actions. The former TNT pipeline located on CWM property and the Town of Lewiston (Component 3) property consists of two parallel vitreous clay pipes encased within concrete. Based on the results of the PRPI, portions of the TNT pipeline are designated for in-place closure. Portions of the pipeline that have been previously disturbed by site development and sampling activities will be excavated and removed with any associated contaminated soils and disposed of off-site.

Accumulated water and sludges will be removed from the chemical lift stations. The chemical lift stations, chemical sewer lines, and portions of the TNT pipeline that will be closed in-place will be cleaned by high-pressure water jets to remove any solids collected in the lift stations/pipelines. When power washing and removal operations have been completed, lift stations and manholes will be sealed to prevent unauthorized access into the lift stations. Portions of the TNT pipeline closed in-place will be sealed at the access points with cement grout to prevent any potential future migration.

For sewer lines and TNT lines closed in-place, it is anticipated that there is little need for LTM since contaminants will be removed by washing, and access to the lift stations and pipelines will be sealed; therefore, the need for LTM will be determined based on the risk assessment completed during the RI/FS process and based in part on the analytical results of the post-IRA wipe samples, which will be collected after the pipeline is power washed and inspected with a pipeline video camera.

In order to document the post-remediation conditions in the portions of the TNT pipeline closed in-place and the chemical waste sewer, wipe samples will be collected from the inside wall using a remote collection method. Samples will be collected at a rate of one sample per accessible location. For the closed portions of the TNT line, a minimum of one wipe sample per 250 ft of closed pipeline (estimated 32 total explosive samples and 16 total of the other compounds) will be collected. The wipe samples for the TNT pipeline will be analyzed at a USACE-approved laboratory for explosives and additionally for Target Compound List (TCL) semivolatiles and PCBs in the southern portion of the pipeline below Sta. 25+00 (15+80 on Design Drawings). Wipe samples collected from the chemical waste sewer will be analyzed for TCL semivolatiles and pesticides/PCBs. The samples will be collected by wiping a 10-centimeter (cm) x 10-cm area of the inside of the sewer/lift station using a remote sampler. The wipe sample will be collected using a dedicated clean gauze pad that has been premoistened with methanol and a clean stainless-steel or aluminum template. A clean pair of phthalate-free gloves will be used to collect each sample.

If constituents are detected in the post-IRA samples at concentrations that warrant evaluation, then the results will be used in the site risk assessment (to be performed under a separate program) to determine if there is need for LTM. This will be performed by a separate contractor designated by CENAB. If LTM is to be performed, examples of such activities that could be performed are provided in Subsection 2.2 of this document.

There is no need for LTM of the excavated pipeline areas, since confirmation sampling of the underlying soil 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 excavated areas will be filled with clean fill that 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. The Contractor will ensure that areas are restored in accordance with the specifications; therefore LTM is not required for these areas.

2.2 POTENTIAL MONITORING ACTIVITIES

There are several potential activities that could be maintained throughout the post-remediation period. These potential activities are:

- Inspections and maintenance of sealed access points.
- Review of results of the current groundwater monitoring program at LOOW to ensure that there are no post-IRA impacts to groundwater due to in-place closures.
- Depending on the results of the risk assessment, installation of approximately five shallow groundwater monitoring wells along the portions of the TNT pipeline left in-place to ensure that there are no post-IRA impacts to groundwater due to in-place closures. Groundwater samples would be collected two times per year from these shallow wells. Samples would be analyzed for explosives, volatile organic compounds, and semivolatile organic compounds. The results would be transmitted to CENAB on a biannual basis.

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 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.

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.
- Note condition of sealed lift stations and other pipeline access areas (including weathering or other physical damage or stress such as vandalism).

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 Components 1, 2, and 3 will be conducted in accordance with the monitoring requirements developed from the results of the risk assessment. If LTM is determined to be necessary, a SAP will be prepared. 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 will be prepared by the Contractor who will be performing the LTM and will be submitted to CENAB for approval. The SAP will be prepared in accordance with: *Chemical Data Quality Management for Hazardous Waste Remedial Activities*, USACE, ER 1110-1-263, October 1990 (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.

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.

4. SITE SAFETY AND HEALTH PLAN

If LTM activities are determined to be necessary based on the risk assessment they will be conducted in accordance with the procedures and protocols in the 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.