

**EXPLOSIVE SAFETY SUBMISSION
FOR SURFACE REMOVAL OF
TNT AT THE LAKE ONTARIO ORDNANCE WORKS (LOOW) SITE 2002
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November 21, 2002

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1. Reason for OE:

1.1 The Former Lake Ontario Ordnance Works site is located in the towns of Lewiston and Porter in Niagara County, New York. The site originally encompassed approximately 7,500 acres with actual U.S. Department of Defense 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 during WWII.

1.2 The manufacturing portion of the plant was situated in the central southwestern section of the LOOW site, south of Balmer Road. Wastewater from the TNT manufacturing operation, as well as storm water 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 water treatment plant at the west end of the production line.

1.3 An overestimation of the need for TNT during WWII resulted in the closure of the TNT plant in July 1943, after only 9 months of operation. Following the decontamination of the TNT plant, 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.

1.4 The Phase 1 Component 1 of this Interim Removal Action (IRA) required flushing and removal of the TNT pipeline. Test site excavations to date have indicated that the pipelines comprising the LOOW TNT pipeline waste sewer system are concrete encased with approximate outside dimensions of 2-ft wide by 3-ft high (including the concrete encasement). The pipelines encased within the concrete are vitreous clay pipe and range in diameter from 10 to 18 inches.

1.5 Initial remediation of the TNT pipeline was performed by Radian International from April 1999 until December 1999. Work stopped and the contract was terminated due to funding constraints. During this time, Radian removed approximately 1600 feet of pipe, and power washed and grouted the ends of approximately 1900 feet of pipe.

1.6 A new contract was awarded to Severson Environmental Services, Inc. in the spring of 2000 to complete the remediation of the TNT pipeline. From the previous years work, it had been determined that it was more cost effective to power wash, video and grout the entire line rather than remove and dispose of the pipeline.

1.7 To that date, 4,500 feet of pipe had been power washed, videotaped and grouted. Since all but one of our preliminary testing of the overburden soils, subsurface soils and test pit samples of the pipe came back with levels of TNT well below the 10% limit, an Explosive Safety Submission (ESS) report was not submitted for this work. One sample (TP #11) was 16.5% TNT. Two years ago ISSI finalized the ESS Report for TP #11. After approval of ESS Report, Severson (ISSI) remediated TP #11.

1.8 During this period it was discovered that the Phase I operations had inadvertently dumped pipe contents in a location adjacent to the 1999 remediation. A thorough investigation and search of the area involved in the Phase 1 operations was undertaken. This search revealed an additional two areas where the contents of the pipe had been dumped leaving the surface and some piles of debris contaminated with crystalline TNT. Using emergency removal authority the observable surface TNT contamination was gathered and with proper local authority approval it was destroyed by burning. The three areas were marked and fencing installed to limit access to the area pending disposition of the remaining contamination.

1.9 This Removal Action (RA) is being conducted to remove any obvious TNT that may exist on the surface in the following four locations:

1.9.1 *Area Alpha*

1.9.2 *Area Bravo*

1.9.3 *Area Charlie*

1.9.4 *CMSA Area*

1.10 A Remedial Investigation (RI) is being conducted on the entire LOOW site. Then a Risk Assessment (RA), Feasibility Study (FS), Proposed Plan (PP) and a Record of Decision (ROD) will be prepared. The four sites listed above will be addressed in those documents and a final course of action will be selected. This will be coordinated with the regulators and stakeholders. An explosive safety submission detailing plans for any other explosives hazards will also be prepared after these decisions are made.

2. Maps:

2.1 Regional Map – LOOW is located in Western New York in Niagara County. The installation lies approximately 10 miles north of Niagara Falls, New York. Refer to Figure 1.

2.2 Site Map - A map showing details of the project site is illustrated in Figure 2. The site map reflects the areas of concern that will be involved in the removal action. The following areas shown on the site map are the areas involved in the removal action. All the areas are located on Chemical Waste Management property.

2.2.1 **AREA ALPHA:** This area contains TNT deposited on the surface with debris from the Phase 1 IRA. The area is approximately 20' by 60' in size. It is located adjacent to the former TNT Waste pipelines at between Station Number 13+00 and Station Number 13+50. Refer to Map Figure 3.

2.2.2 **AREA BRAVO:** This area contains TNT deposited on the surface with debris from the Phase 1 IRA. The area is approximately 20' by 40' in size. It is located adjacent to the former TNT Waste pipelines at between Station Number 18+50 and Station Number 19+00. Refer to Map Figure 4.

2.2.3 **AREA CHARLIE:** This area contains TNT deposited on the surface with debris from the Phase 1 IRA. The area is approximately 100' by 100' in size. It is located adjacent to the former TNT Waste pipelines at between Station Number 24+00 and Station Number 27+50. Refer to Figure 5.

2.2.4 **CONTAMINATED MATERIAL STORAGE AREA (CMSA) PAD:** This area contains TNT deposited inadvertently on the surface of the pad during pipeline removal operations. The area is approximately 200' by 200' in size. It is located at the junction of Cedar and M Streets, south of the former TNT Waste pipelines. Refer to Figure 6.

2.2.5 **Removal Depth:** This action will be limited to a surface walkover of the four areas and observable TNT will be removed.

2.2.6 **Location of Magazines:** Magazines will not be employed for this removal action.

2.2.7 **OB Area:** Area Charlie will be used for the OB area should burning of the recovered TNT be required for some unforeseen circumstance. Refer to appendix C for the procedures.

2.2.8 **Current and Planned Land Use:** Chemical Waste Management is the site owner and uses the site for a RCRA TSD facility. The areas of concern are currently not used except as part of the internal road system. Future land use is not going to change in the foreseeable future.

2.3 Q-D Maps:

2.3.1 **Area A, B, and CMSA:** The MSD for is 346 feet. This distance is based on a conservative approach of using the Q-D distances in Table C2.T1, DOD 6055.9-STD and limiting the amount of TNT collected to not more than two pounds at a time.

2.3.2 **Area C:** The MSD is 474 feet. This distance is based on a conservative approach of using the Q-D distances in Table C2.T1, DOD 6055.9-STD and limiting the amount of TNT blending operations to not more than ten pounds at a time.

2.3.3 **Magazines:** Not applicable

2.3.4 **OB Area/Area C:** The MSD is 474 feet. This distance is based on a conservative approach of using the Q-D distances in Table C2.T1, DOD 6055.9-STD and limiting the amount of TNT being burned to not more than ten pounds at a time.

3. **Amount and Type of OE.** This removal is for the sole purpose of removing any exposed TNT from the surface of the areas of concern. This effort is not expected to result in the collection of more than 10 pounds of TNT total.

4. **Start Date:** The removal action is scheduled to start on 1 Mar 2003.

5. **Frost Line:** The frost line for this area is 59 inches. Frost action is not expected to move TNT from the subsurface to the surface prior to the RI/FS being completed and the final remedy for the site selected and implemented.

6. Clearance Techniques:

6.1 Walkover and Removal of TNT in Areas of Concern:

6.1.1 The removal of the TNT from the areas of concern will be accomplished by the a two person UXO team consisting of a Senior UXO Supervisor and UXO Technician III. Each of the four TNT contaminated areas will be divided into three (3) foot wide lanes. A second series of lanes will be established 90 degrees from the original lanes thereby making a grid. This grid will also be drawn on graph paper and identification letters and numbers assigned to each grid.

6.1.2 Once the grid layout is in place the walkover and inspection will begin. Each UXO Technician will walk the individual lanes and look for exposed TNT. Once suspected TNT is located it will be treated with EXSPRAY Explosive Test Spray to confirm the presence of TNT. If the test is positive the TNT will be marked with a red pin flag adjacent to the TNT. The location will also be annotated on the Grid Map for that area.

6.1.3 Recovered TNT will be placed in a five gallon plastic bucket containing approximately 3 inches of mineral oil. The recovering will continue until no more than 2 pounds are collected. The recovered TNT will be transported to the TNT blending area in Area C.

6.1.4 No more than 10 pounds of TNT will be allowed to accumulate in Area C before blending takes place. If 10 pounds is not collected by the afternoon of the work day, then the amount collected that day will be blended so that collected TNT will not be left in Area C over night.

6.2 TNT Nugget Processing: This process will take place in Area Charlie and will be completed prior to blending taking place.

6.2.1 Remove TNT nuggets from the 5 gallon bucket one at a time and measure their diameters.

6.2.1.1 If the diameter is $\frac{1}{2}$ " or less, place them in the Plastic holding container containing mineral oil.

6.2.1.2 If the TNT nugget measures over ½" in diameter, the nugget will be submerged and gently broken by hand into smaller pieces.

6.2.1.3 When the pieces are found to be hard and cannot be broken by hand, it will be placed in a mineral oil soak bath until it softens, and then gently broken.

6.2.1.4. Repeat process until all TNT nuggets have been resized.

6.3 **Blending Operation :**

6.3.1 Clean sand, will be utilized in the blending operation. The resized TNT will be carefully distributed through the sand, by hand, to insure maximum dispersion and to reach a ratio of 5 % or less. Mixing of the TNT and sand will be accomplished with non-sparking tools. Mixing will be accomplished by hand utilizing plastic shovels and plastic rakes.

6.3.2 Upon completion of all mixing operations an EnSys TNT Soil Test System Kit will be utilized to insure that the explosive content of the sand is 5% or less.

6.4 **QC/QA:**

6.4.1 QC for this effort will be conducted by a visual inspection of 10% of the grids by the QC Specialist designated for the project. A failure will be the finding of TNT on the surface of the ground in a grid. A failure will result in the grid being reinspected for visible TNT by the contractor.

6.4.2 QA for this effort will be conducted by a visual inspection of 10% of grids by the government OESS designated for the project. A failure will be the finding of TNT on the surface of the ground in a grid. A failure will result in the grid being reinspected for visible TNT by the contractor.

7. **Off-site disposal:** After all bending has taken place, the soil will be sampled to ensure the concentration is below 5 percent and then containerized for transport to an approved permitted facility for materials that contain TNT in the concentration below the cleanup criteria. The approved facility is Modern Land Fill located adjacent to the site.

8. **Quantity Distance:** The Q-D for the areas during all operations are discussed in paragraph 2.3 above.

9. **Technical Support:** Technical support from other organizations is not anticipated for this effort.

10. **Land use restrictions:** No land use restrictions are anticipated at the end of this effort.

11. **Public Involvement:** Public involvement is carried out by the Buffalo District through the RAB and public meetings.

12. **After Action Report:** An AAR will be prepared and submitted through the approval chain at the close of this effort.

13. **Amendments and corrections:** Should explosive hazards not addressed in this ESS be encountered, an amendment to this submission will be prepared and submitted for approval.

APPENDIX A
PROCEDURE FOR BURNING
RECOVERED TNT

TNT BURING PROCEDURE

A-1 The burning of TNT will occur in 2 burn trays, consisting of a 55-gallon drum cut in half and placed on the ground. Each tray will be spaced a minimum scaled distance of K11 (25 feet) measured from the outer edge of the trays to prevent the promulgation should an unintentional detonation occur during the burning operation and a minimum of 200 foot radius of noncombustible material will exist from the edge of the burn trays.

A-2 A maximum of 10 pounds will be placed in each burn tray for burning. All TNT nuggets will be 1 inch diameter or smaller and will be placed within the trays in layers not to exceed 3 inches in thickness. Approximately 2 gallons of fuel oil (diesel or kerosene) will be poured over the TNT within each tray. The trays will be ignited remotely with the use of electric squibs and smokeless powder in sequence.

A-3 The burn will be considered complete one hour after the last smoke is seen rising from the trays. The trays will not be inspected nor disturbed for an additional 12 hours. After 12 hours, the trays will be reloaded for another burn if necessary. The procedures will be repeated until all recovered TNT is disposed of.

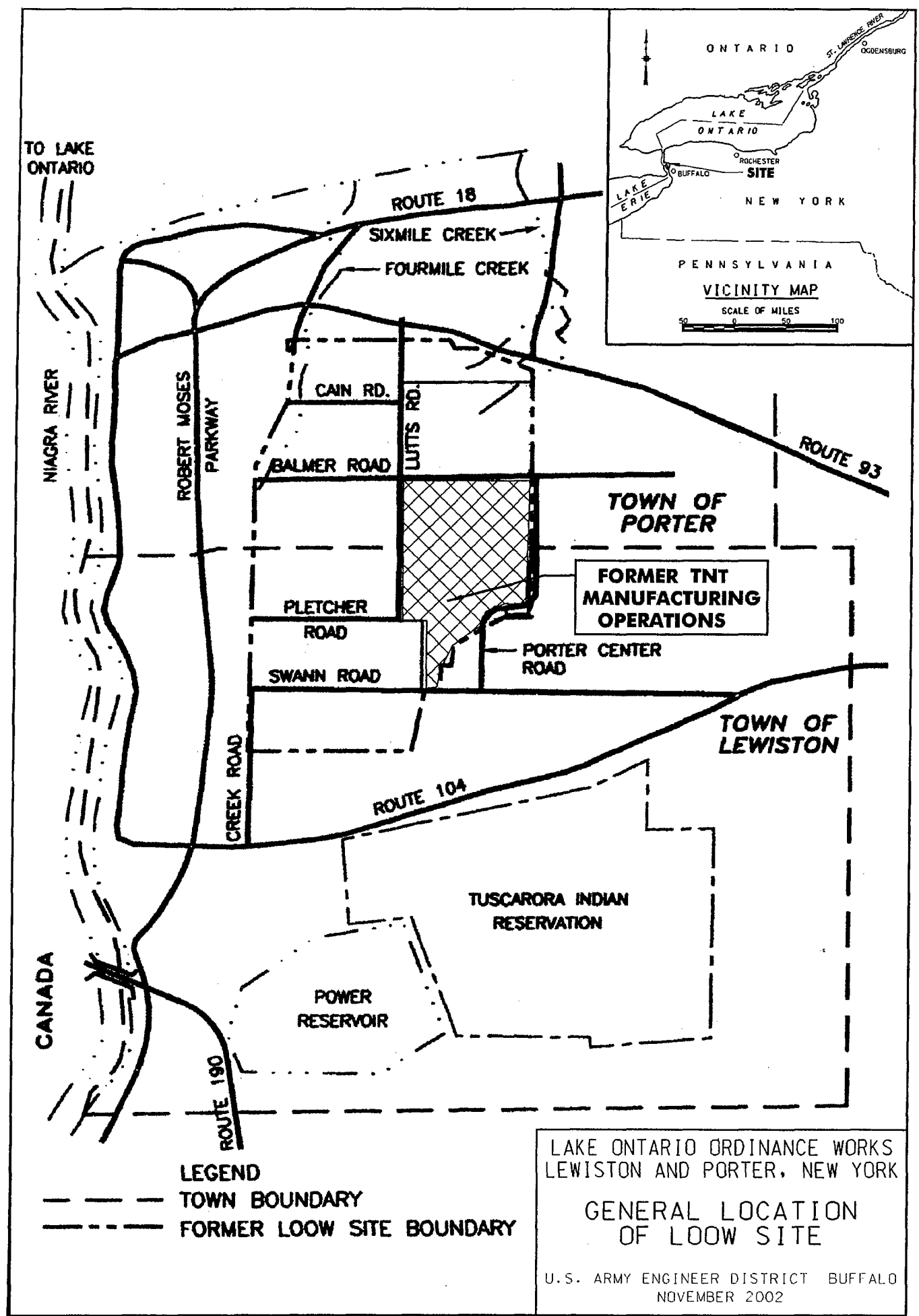
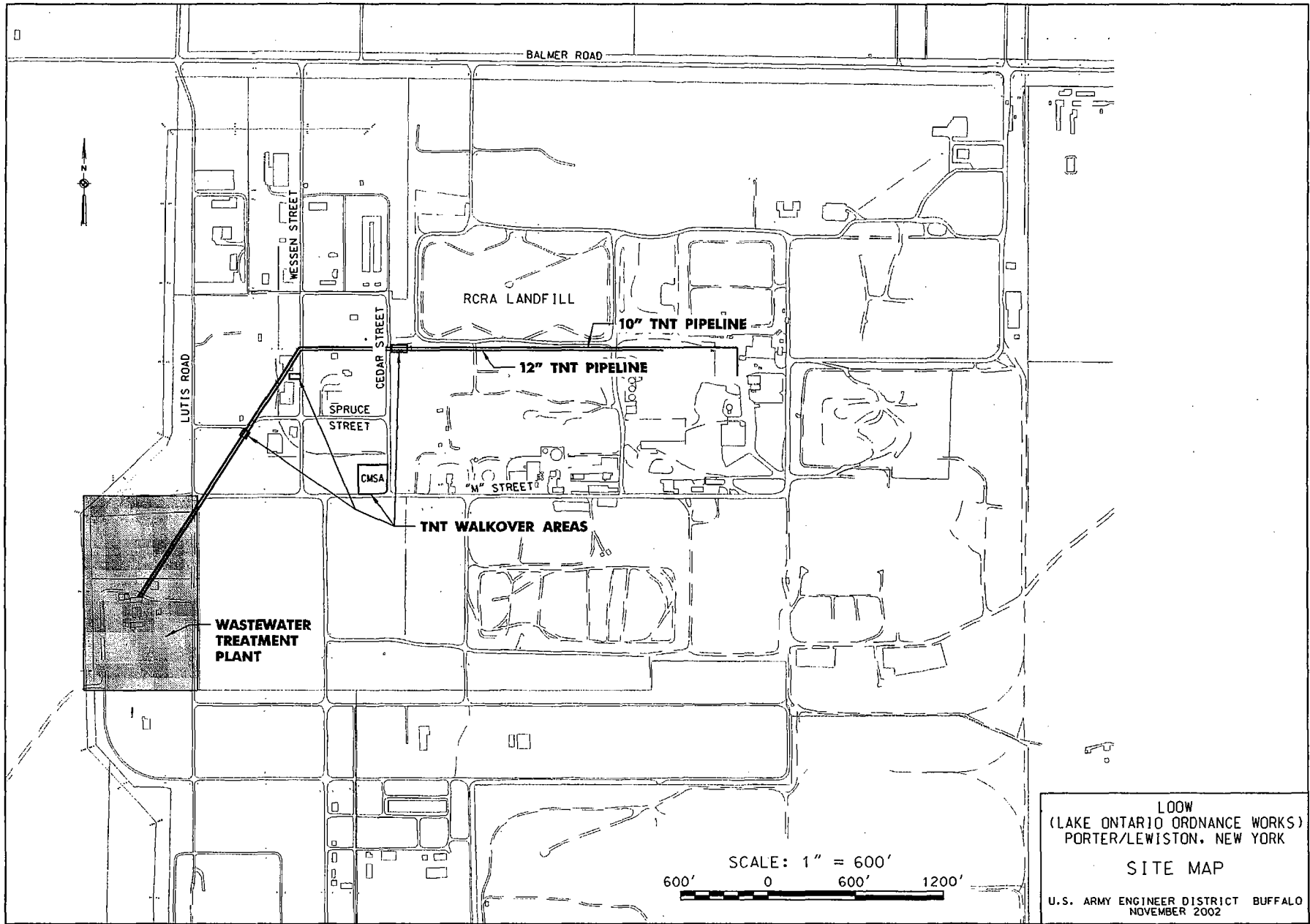
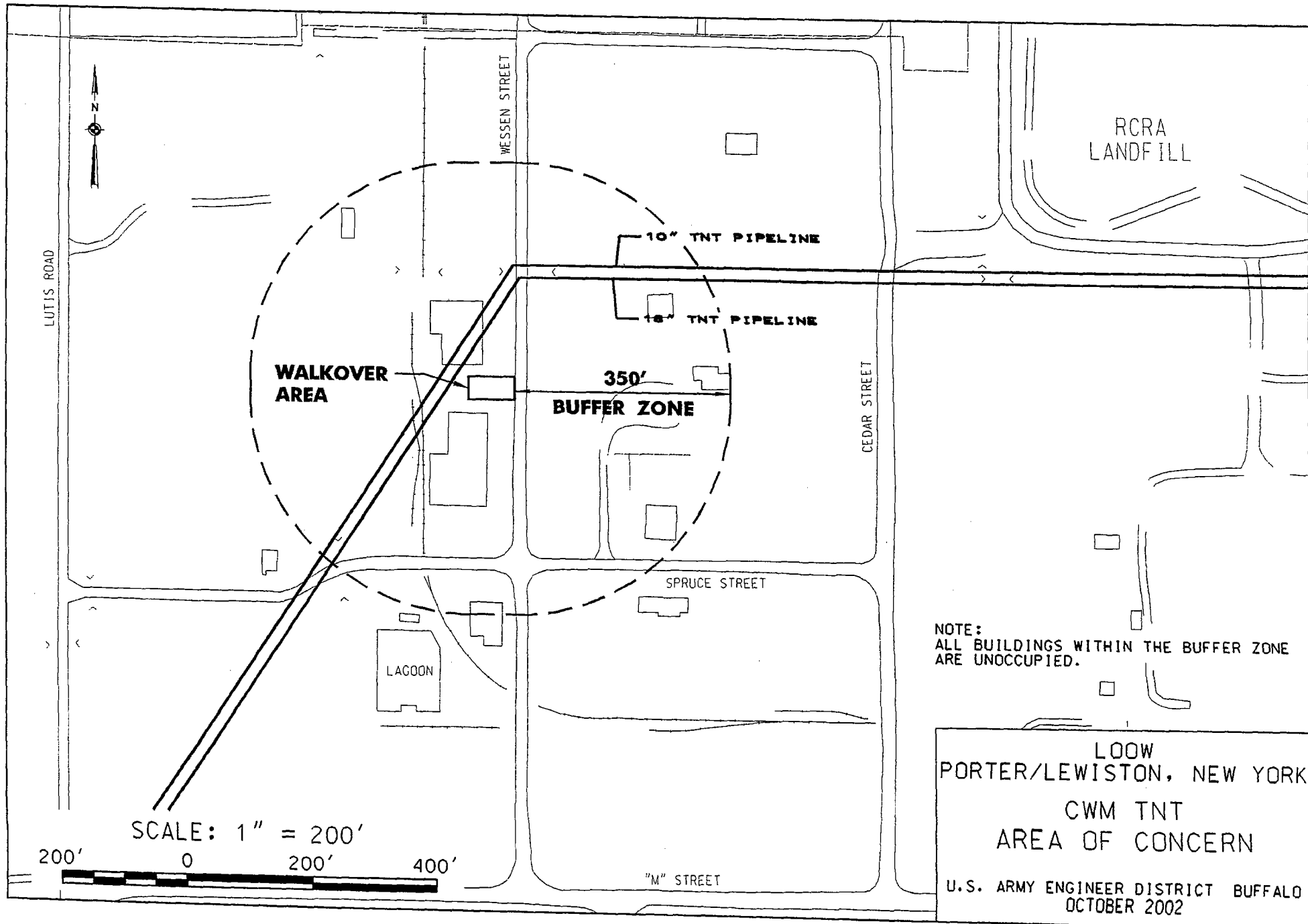


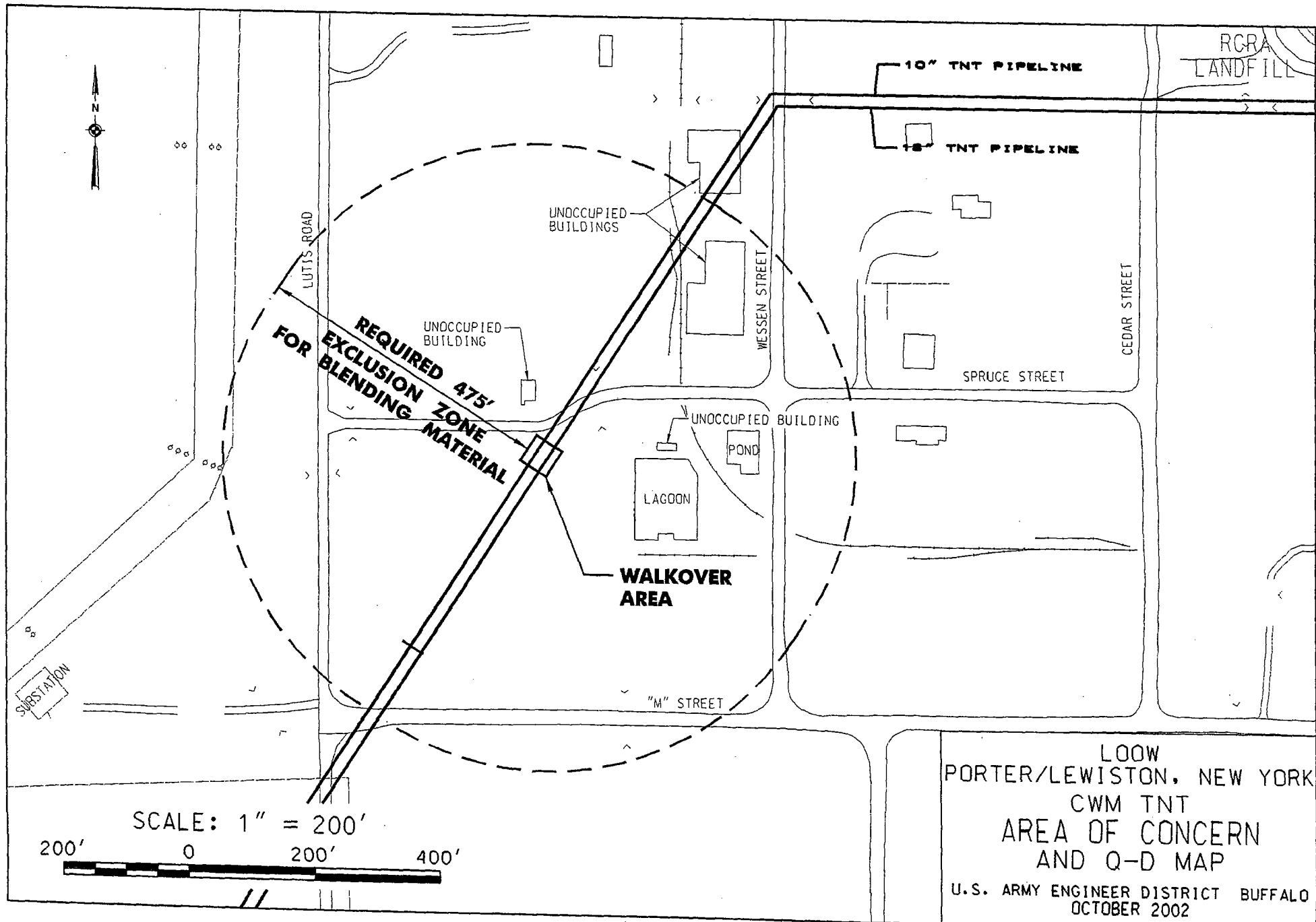
FIGURE 1



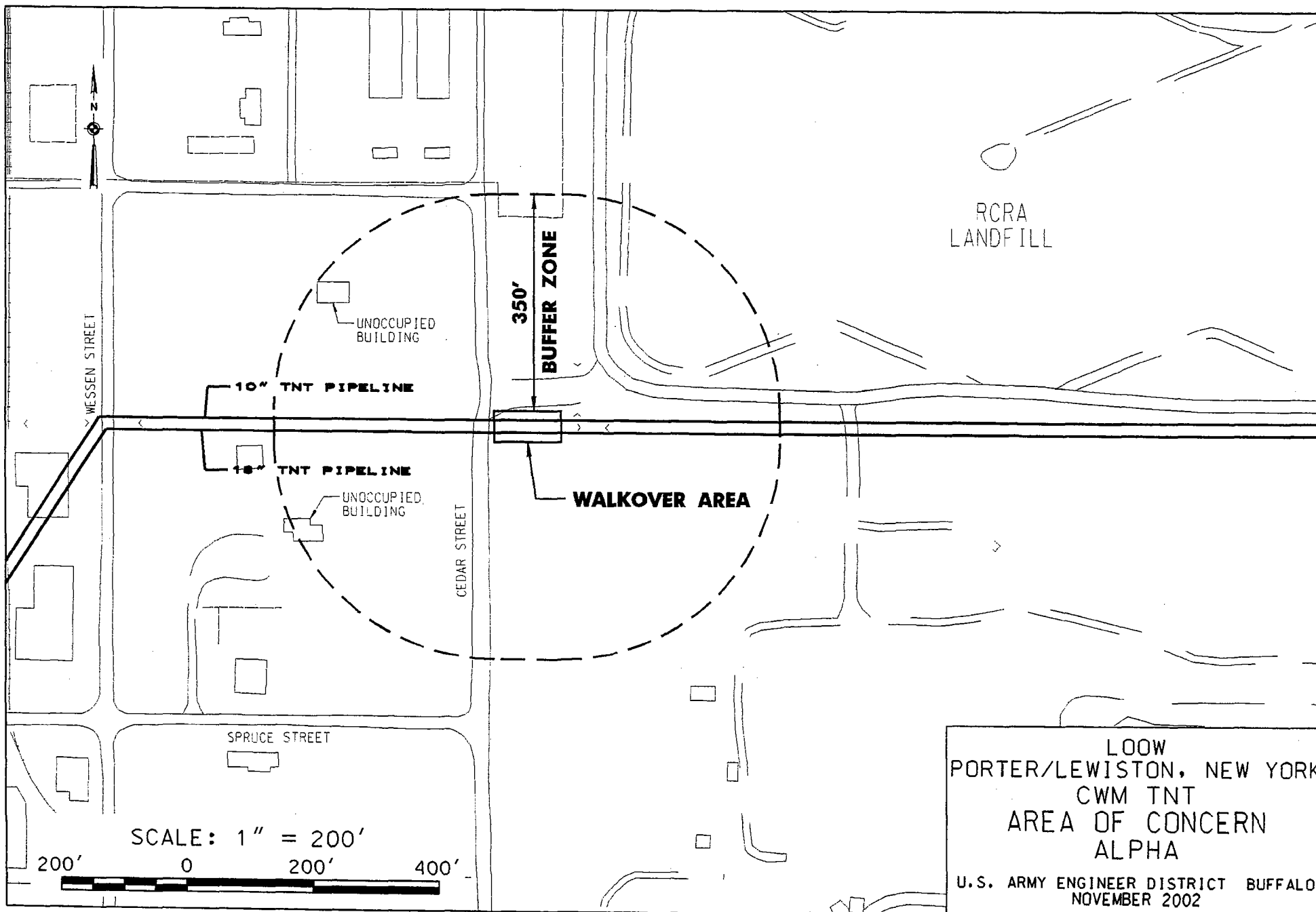
LOOW
(LAKE ONTARIO ORDNANCE WORKS)
PORTER/LEWISTON, NEW YORK
SITE MAP
U.S. ARMY ENGINEER DISTRICT BUFFALO
NOVEMBER 2002

FIGURE 2





LOOW
PORTER/LEWISTON, NEW YORK
CWM TNT
AREA OF CONCERN
AND Q-D MAP
U.S. ARMY ENGINEER DISTRICT BUFFALO
OCTOBER 2002



LOOW
PORTER/LEWISTON, NEW YORK
CWM TNT
AREA OF CONCERN
ALPHA
U.S. ARMY ENGINEER DISTRICT BUFFALO
NOVEMBER 2002

