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U.S. Army Corps of Engineers
Baltimore District

Remedial Design for Interim Removal Actions
Operable Units 1 and 2
Former Lake Ontario Ordnance Works
Lewiston and Porter
Niagara County, New York

Intermediate Design Analysis Report
Component One (CWM Property)

60% Design Submittal

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Prepared for:

U.S. ARMY CORPS OF ENGINEERS
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INTERMEDIATE DESIGN ANALYSIS REPORT
COMPONENT ONE (CWM PROPERTY)
60% DESIGN SUBMITTAL

Prepared for

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LIST OF ACRONYMS

ACM	asbestos-containing materials
AFP-68	Air Force Plant 68
ALAAP	Alabama Army Ammunition Plant
ARARs	applicable or relevant and appropriate requirements
CENAB	U.S. Army Corps of Engineers, Baltimore District
Chem-Trol	Chem-Trol Pollution Services, Inc.
CWM	Chemical Waste Management
DAR	Design Analysis Report
DERP	Defense Environmental Restoration Program
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
EE/CA	Engineering Evaluation/Cost Analysis
HASP	Health and Safety Plan
HRS	Hazard Ranking System
LOOW	Lake Ontario Ordnance Works
NESHAP	National Emission Standards for Hazardous Air Pollutants
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health Administration
PCBs	Polychlorinated biphenyls
PPE	personal protective equipment
PRDI	Preliminary Remedial Design Investigation
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
SCA	SCA Chemical Services, Inc.
SOW	scope of work
SPDES	State Pollutant Discharge Elimination System
TNT	trinitrotoluene
TSD	treatment, storage, and disposal
USACE	U.S. Army Corps of Engineers
VOCs	volatile organic compounds
yd^3	cubic yards

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 for Operable Unit Nos. 1 and 2 (OU No. 1 and OU No. 2) at the former Lake Ontario Ordnance Works (LOOW) located in Niagara County, New York. The remedial design is being performed in two phases in accordance with the CENAB scope of work (SOW) dated 23 May 1996. The first phase, the predesign phase, includes the preparation of the planning documents and completion of the preliminary remedial design investigation (PRDI) and report.

The purpose of the PRDI was to provide supplemental data for the second phase of the remedial design, the design for the selected remedy presented in the Final Engineering Evaluation/Cost Analysis (EE/CA) dated March 1995. The supplemental data collected during the PRDI augments the existing data obtained from previous investigations at the LOOW site. The objectives of the PRDI included the following:

- Further characterize the aqueous and solid contents of the trinitrotoluene (TNT) pipelines and underlying soils to estimate the quantity and determine the nature of these materials for the remedial design.
- Determine if explosive compounds are present in the standing water and sediments in the chemical waste line lift stations of the former high-energy fuels plant, closest to the TNT pipelines, to determine the appropriate handling and disposal requirements for the remedial design.

A summary of the results of the previous investigations is provided in Section 2 of the Remedial Design Work Plan dated October 1996. The results of the PRDI are presented in the final PRDI Report dated May 1997. The findings and conclusions of the previous investigations and PRDI are discussed in this document with regard to the basis of the proposed interim removal actions of the subject areas.

The remedial design will be completed in the following stages: 30%, 60%, 90%, and 100% designs. This Design Analysis Report (DAR) is part of the 60% remedial design submittal. This DAR provides a discussion of the general design concepts and approach to the remediation of each subject area. The 60% design includes the preparation of preliminary contract plans, preliminary performance-based contract specifications, Code B cost estimate (M-CACES Gold software), and long-term monitoring plan. The index of preliminary plans and specifications are included as appendices to this DAR. In addition, the 60% submittal includes updated general site plans, which are provided as an appendix to this document.

1.2 GENERAL SITE BACKGROUND AND AREAS OF CONCERN

1.2.1 General Background

The former LOOW site is located within the towns of Lewiston and Porter in Niagara County, New York (see 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.

The manufacturing portion of the plant was situated in the central southwestern section of the LOOW site, south of Balmer Road (see Figure 1-2). 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.

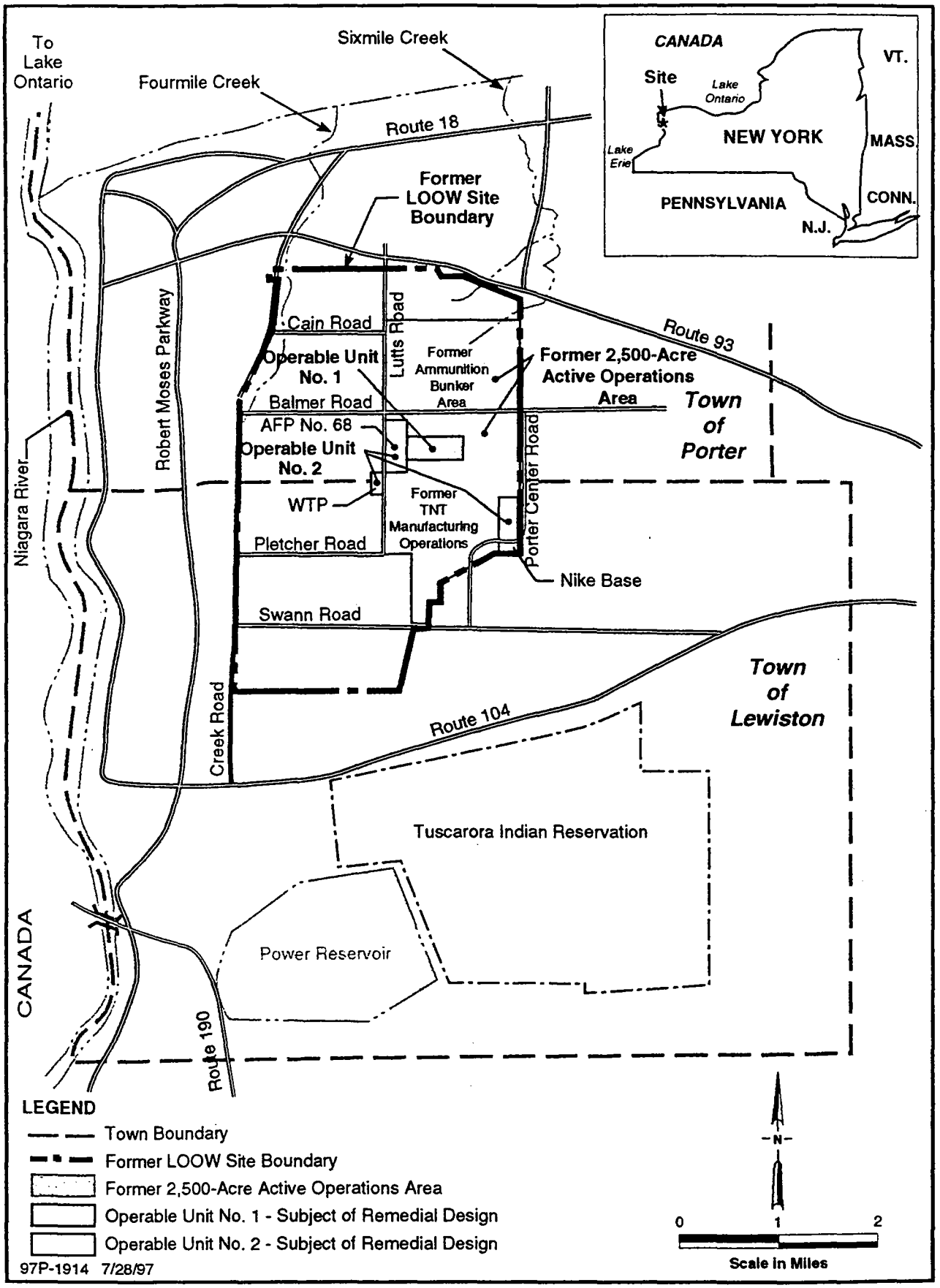


FIGURE 1-1 LOOW LOCATION MAP

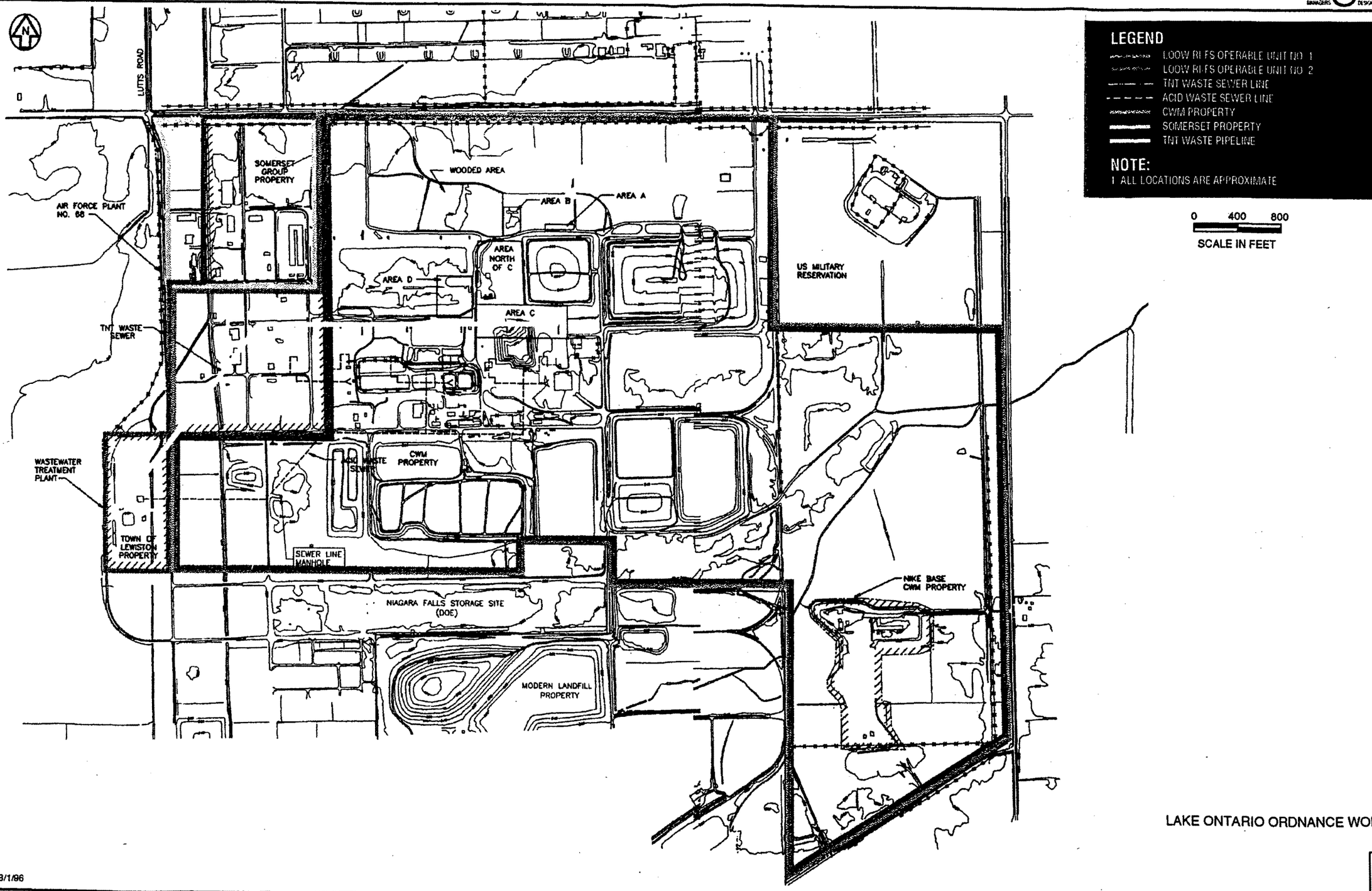


FIGURE 1-2 LOOW STUDY AREA LOCATION MAP

An overestimation by the Army of the need for TNT during World War II resulted in the closure of the TNT plant in July 1943, after only 9 months of operation. Following the decommissioning 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.

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. The acquisition of the properties by the Navy and the Air Force was for the joint development of a boron- and lithium-based high-energy rocket fuel production plant. The Air Force subsequently assumed responsibility for the project, which was identified as Air Force Plant 68 (AFP-68). Part of the construction of AFP-68 involved tying in the AFP-68 sanitary, stormwater, and chemical waste sewer systems into the former TNT wastewater treatment plant located approximately 1,000 ft southwest of AFP-68. AFP-68 was decommissioned in 1959 while still in pilot-plant status.

In 1972, Chem-Trol Pollution Services, Inc. (Chem-Trol) acquired portions of the 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 Chemical Waste Management (CWM) in the early 1980s. In 1969, the Somerset Group obtained an approximate 100-acre section of the former LOOW property that contained 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.

1.2.2 Areas of Concern

Under the authority of the Defense Environmental Restoration Program (DERP), the U.S. Army Corps of Engineers (USACE) has undertaken a remedial investigation/feasibility study (RI/FS) at

the LOOW site. As part of the RI/FS, USACE has investigated areas grouped into two separate operable units, OU No. 1 and OU No. 2 (Figure 1-1 and Figure 1-2).

Operable Unit No. 1

OU No. 1 consists of the following seven areas on property currently owned by CWM as shown in Figure 1-2:

- An area originally suspected to contain approximately 30 buried drums, identified as Area A.
- An area used for the open incineration of wastes from AFP-68, identified as Area B.
- Three areas, originally suspected to contain a buried drum trench containing 200 to 300 drums also related to AFP-68, identified as Areas C, D, and Area North of C.
- An area originally suspected to contain buried drums located west of Area B, identified as the Wooded Area.
- The underground TNT and acid waste sewer systems from the original LOOW TNT manufacturing plant.

Remedial investigations for OU No. 1 were conducted in 1988 and 1989. The investigations verified the presence of buried drums and localized soil and groundwater contamination in Area A, and contaminated sediments and localized groundwater contamination in Area B. The buried drums encountered in Area A were generally in a highly deteriorated condition and not intact. None of the suspected buried drums in Areas C, D, and the Area North of C were found, nor were any drums or contamination found in the Wooded Area. Investigations of the buried TNT sewer system identified the presence of TNT residues in the sewer system.

Based upon the findings of the RI, which included a qualitative risk assessment, an FS for OU No. 1 was initiated in 1989 with an advance final FS report completed in 1990. On 6 January 1992 the New York State Department of Environmental Conservation (NYSDEC) formally approved the preferred remedial alternative, which consisted of the excavation of contaminated drums and soils from Areas A and B and disposal of these materials at an approved RCRA-permitted landfill. A final recommended approach to the remediation of the TNT pipelines was not presented to NYSDEC until the results of further investigation were available. The PRDI

provided supplemental data for the purpose of finalizing the remedial approach and design for the TNT pipelines. The draft report (February 1997) and final PRDI report (May 1997) were submitted to NYSDEC for review and comment. The 30% design, including the DAR was submitted on 16 April 1997 to NYSDEC. Response to comments received from NYSDEC and USACE reviewers are provided in Appendix A of this report.

Operable Unit No. 2

OU No. 2, as shown in Figure 1-2, consists of the former AFP-68, located on properties owned by CWM and the Somerset Group; a portion of the former NIKE Missile Base, located on CWM property; and the former LOOW wastewater treatment plant, located on property owned by the Town of Lewiston.

The first investigations of OU No. 2 began during RI activities for OU No. 1, during which time (1988) USACE performed a reconnaissance survey of those properties comprising OU No. 2 plus the existing TNT buildings located on CWM property. The reconnaissance survey consisted of a detailed site walkover that included confirming site conditions with numerous available site maps and as-built drawings. A summary report of this survey was prepared in late 1988. In 1992, USACE initiated a confirmation study of the OU No. 2 areas of concern, excluding the TNT buildings.

Because no previous sampling had been performed at any of the OU No. 2 study areas and under the supposition that contamination existed in some of those areas, the confirmation study investigations included some investigative aspects more applicable to an RI. These additional investigations included monitoring well installation and groundwater sampling, perimeter and personnel exposure air monitoring, Hazard Ranking System (HRS) II scoring, and a preliminary contamination assessment that incorporated many aspects of a baseline risk assessment.

The results of the OU No. 2 investigation were summarized in a Preliminary Contamination Assessment Report that was issued final in December 1992. The results indicated the presence of several contaminant source areas, specifically portions of the AFP-68 chemical waste sewer system, loose asbestos-containing material (ACM) located within and around several of the

former facility buildings, and miscellaneous containers of hazardous liquids and oils stored within buildings and concrete pads of various locations within the former AFP-68.

In 1994 USACE performed an EE/CA for portions of OU Nos. 1 and 2. The EE/CA was prepared to address non-time-critical removal actions in the following areas:

- OU No. 1
  - Area A—buried drum trench on CWM property.
  - Area B—burn pit area on CWM property.
  - TNT pipelines on CWM property.
- OU No. 2
  - AFP-68 consisting of the following:
    - Chemical waste sewer system sewage and sludges located on both the CWM and Somerset Group properties.
    - Loose ACM on the Somerset Group property.
    - Miscellaneous containers of hazardous liquids and oils on the Somerset Group property.

A summary of the EE/CA recommendations for the above-listed subject areas is presented in the following subsection.

1.3 RECOMMENDATIONS OF ENGINEERING EVALUATION/COST ANALYSIS

The intent of the non-time-critical removal actions at the LOOW site is to reduce the threat of exposure and/or contaminant migration from identified source areas until a final remedial action(s) is implemented. Specific objectives for accomplishing this goal were defined as:

- Removal of previously identified contaminated sediment, soil, and drums from the Area A drum trench and the Area B burn pit.
- Removal of contaminated materials associated with the former TNT pipeline system.
- Removal of accumulated sludges and liquids in the chemical waste sewer system and associated lift stations.
- Dewatering of all areas, as needed, to remediate the above-referenced areas.

- Removal of loose ACM and miscellaneous containerized liquids and oils identified during previous site investigation on the Somerset Group Property.
- Proper treatment and/or disposal of all wastestreams from the removal actions.
- Restoration of all disturbed areas.

Based on the EE/CA, interim removal action remedies were selected for the LOOW areas of concern. The remedial design consists of the preparation of design plan and specifications for the selected removal actions detailed in the subsections that follow. This DAR outlines the general design concepts and approach for the removal actions highlighted below.

1.3.1 Areas A and B

The highest ranked removal action for Areas A and B was the excavation/landfilling disposal alternative. Under this alternative, the contaminated sediment, soil, deteriorated drums, and miscellaneous materials will be excavated and transferred by truck to a competitively bid permitted facility for disposal. The material will be pretreated as required for disposal.

1.3.2 TNT Pipelines

The proposed approach to the remediation of the TNT pipelines presented in the EE/CA included:

- Removal and open flaming/detonation of any encountered crystalline TNT solids at a nearby secure site.
- Removal and biotreatment of explosives-contaminated sediment and solids.
- Removal and disposal of all remaining excavated materials characterized as a hazardous waste at a permitted RCRA landfill.
- Removal and disposal of all nonhazardous materials at a 6NYCRR Part 360-permitted landfill.

Based on the results of the PRDI, alternative approaches to complete removal may be more applicable. A discussion and evaluation of potential alternatives for the remediation of the TNT pipelines were presented in the 30% DAR and revised in this 60% DAR in accordance with the comments received from USACE and NYSDEC.

1.3.3 Chemical Waste Sewer System/Lift Stations

The highest ranked removal action consists of the following:

- Removal of the bottom sludges by vacuum extraction.
- Treatment of the removed sludges by thermal destruction at an existing off-site permitted incinerator.
- High-pressure water jet cleaning of the lift stations and trunkline. The sludge/ wastewater mixture from the cleaning operation would be vacuumed into a tank truck and transferred to a competitively bid, permitted treatment facility.
- Final sealing of the lift stations by rewelding the manhole covers to reduce the safety hazard.

1.3.4 Aqueous Matrix (for above Areas)

The liquids present in the excavations, pipeline systems, and lift stations will be collected as part of the removal action and pumped into a tank truck for transfer for treatment to a competitively bid permitted treatment facility. Treatment requirements will be determined based on sampling results for the contaminated water.

1.4 OBJECTIVE AND SCOPE OF DAR

The objective of this DAR is to present the preliminary design approach to the remediation of the subject areas based on the recommendations of the EE/CA, results of the PRDI, and comments received on the 30% design submittal. The preliminary design outlined in this document includes a description of the primary components or steps in the interim response action for each area. The corresponding design plans and specifications are referenced for each of these components.

The results of the PRDI indicated that varying conditions and concentrations of contamination are encountered throughout the TNT pipeline. The TNT pipeline was found intact except for the upgradient sections, where portions of the pipeline had been excavated and removed as a result of construction activities associated with landfill expansion. A single approach to the remediation of the pipeline may not be cost effective or possible due to the different regulatory criteria applied to

the different contaminants, concentrations of contaminants, and materials that would be removed/ remediated. For example, in some sections of the pipeline only trace levels of contamination were detected in the contents of the pipeline, whereas in other sections both elevated concentrations of explosive compounds and volatile organic compounds (VOCs) were encountered. Polychlorinated biphenyls (PCBs) were also detected in a section of the lower south pipeline. These findings, along with the issues associated with existing structures (salt pond, roads, buildings, etc.) located over the TNT pipeline and consideration of in-place closure techniques that have been used at other former TNT productions sites, require the evaluation of alternative approaches to the removal action for the pipeline.

Section 2 of this DAR presents the general design concepts to the interim removal action of Areas A and B, asbestos and containerized material (Somerset Property), and the chemical waste sewer based on the results of the PRDI and comments received on the 30% design submittal. The development of alternatives for the TNT pipeline and a summary of the PRDI findings regarding the TNT pipeline are provided in Section 3. Applicable regulations and criteria for treatment and disposal options are also presented in Section 3. Based on the recommendations presented in the 30% DAR and the comments received on these recommendations, the design approach to the interim removal action for the TNT pipeline is provided in Section 4.

1.5 DOCUMENT OUTLINE

This DAR has been prepared in accordance with the CENAB SOW dated 23 May 1996. The document has been organized as follows:

- Section 1—Introduction
- Section 2—General Design Concepts
- Section 3—Development of Remedial Alternatives for TNT Pipeline
- Section 4—Remedial Approach for TNT Pipeline

The list of preliminary design plans and specifications are provided as Appendix B to this report. The general site plans and environmental checklist are also provided as Appendix C to this report.

2. GENERAL DESIGN CONCEPTS

2.1 AREA A REMEDIATION

Area A is located southeast of the intersection of Balmer Road and Lutts Road within OU No. 1 on the former LOOW site (see Figures 1-1 and 1-2). The footprint of Area A is approximately 250 ft by 150 ft. The area was first investigated in 1981 by SCA (EE/CA, Acres, March 1995). During this investigation an approximately 220-ft-long by 40-ft-wide buried drum trench was encountered.

2.1.1 Site Background

Test pit excavation activities conducted during the initial RI in 1988 (EE/CA, Acres, March 1995) verified the presence of buried drums in Area A. The combined results of geophysical surveys, test pit excavations, and soil boring activities, conducted during the RI, indicated that the buried drum trench is approximately 220 ft long by 40 ft wide by 10 ft deep. The estimated areal extent of Area A is shown in Figure 2-1. The drum trench is located along the southern part of Area A and extends just under the northern side of H Street.

The contaminants that were detected above the NYSDEC cleanup level in Area A are presented in Table 2-1. The buried drums and test pit water displayed the greatest concentrations of contaminants.

Based on the information gathered to date, the following materials have been identified for remediation (EE/CA, Acres, March 1995):

- Drums and contaminated trench soils with an estimated volume of approximately 4,000 cubic yards (yd^3) (based on the trench dimensions of 220 ft by 40 ft by 10 ft for a total of 3,259 yd^3 of contaminated material, plus 20% for overexcavation).
- Localized contaminated groundwater from within the trench, estimated at 200,000 gallons (based on groundwater at 3 ft below ground surface [bgs], which equates to 70% of the trench being within the saturated zone and an estimated porosity of 40% for the trench materials). The existence of any contaminated groundwater beyond the immediate trench is not considered part of this removal action.

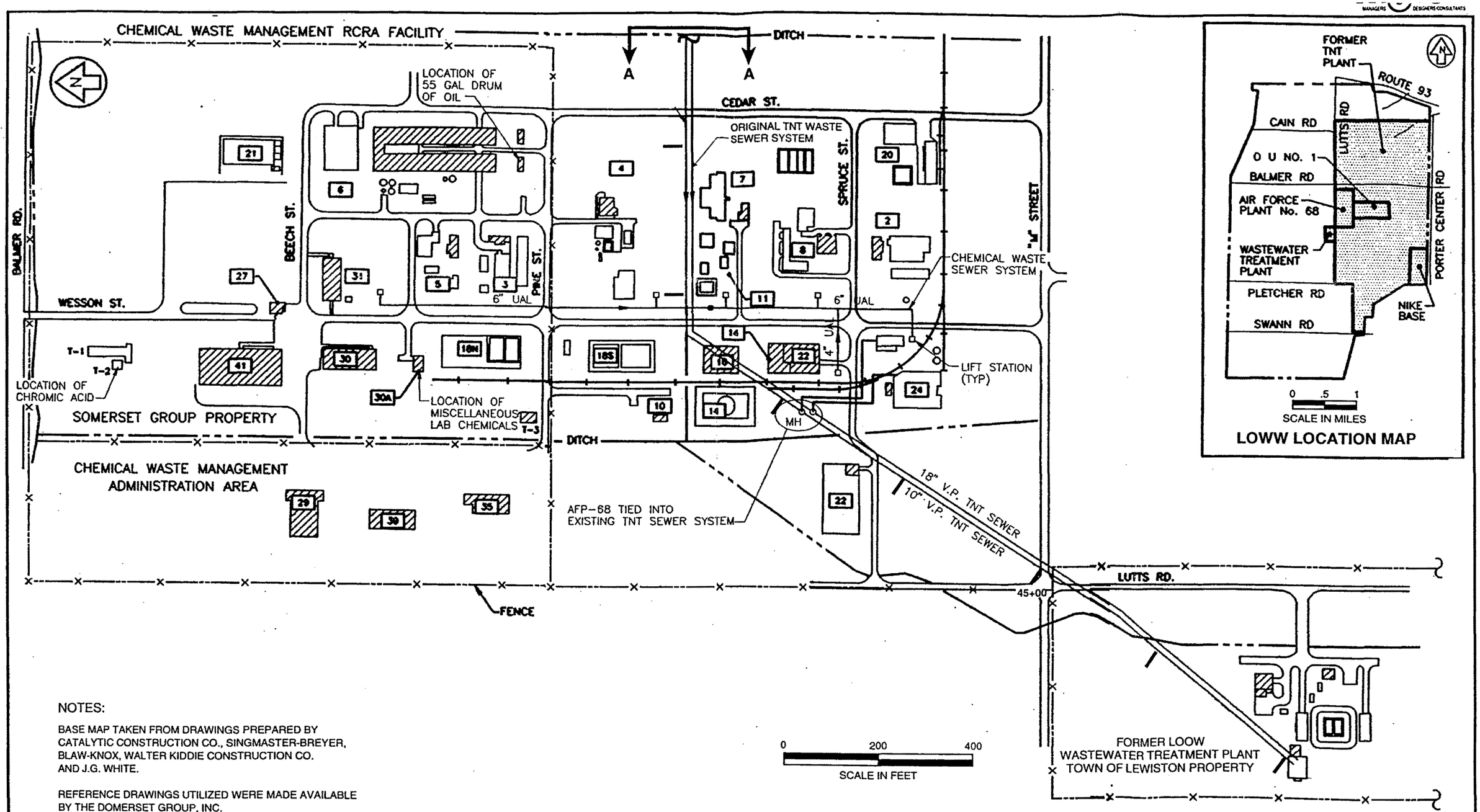
2.1.2 Preferred Removal Action

The removal action recommended in the EE/CA is the removal and disposal alternative in which the contaminated materials within the identified dimensions of the Area A drum trench would be excavated by backhoe or excavator and trucked for disposal at a competitively bid permitted facility (see Figure 2-2 for Area A Removal Action Flow Diagram). Based on previous site investigations, the drum trench limits are estimated at 220 ft long by 40 ft wide by 10 ft deep. Initial excavation will be performed within these dimensions. Confirmation soil sampling will be conducted within the limits of the excavation to verify that removal of contaminated material has been completed to established cleanup criteria standards. Further details of this remedial action are outlined in the following subsections.

2.1.3 Site Preparation

Prior to commencing site excavation in the designated removal areas within Area A, all vegetation, topsoil, and rootmass will be removed from within the limits of the proposed excavation. Requirements for site preparation will be provided in the contract specifications (Section 02110: Clearing and Grubbing). Topsoil will be temporarily stockpiled at a designated location for site revegetation at the completion of removal activities. Stockpiled topsoil will be sampled prior to placement for site revegetation. All subsurface utility lines, currently located within and along the limits of work, will be either relocated outside the limits of work or clearly identified so as to avoid their damage by, and interference with, earthwork-related construction activities. Based on utility maps of the area, an existing underground electrical line will need to be relocated from the eastern side of Area A.

Area A is located adjacent to an active access road used by CWM. Area A and the adjacent road are located within an active RCRA treatment, storage, and disposal facility (TSDF). Complete closure of the roadway during excavation operations shall be restricted to a Friday to Monday time period with full access available to CWM by Tuesday morning. Partial (one lane) and full closures shall be limited and coordinated with CWM. Temporary sheeting and shoring may be



NOTES:

BASE MAP TAKEN FROM DRAWINGS PREPARED BY CATALYTIC CONSTRUCTION CO., SINGMASTER-BREYER, BLAW-KNOX, WALTER KIDDIE CONSTRUCTION CO. AND J.G. WHITE.

REFERENCE DRAWINGS UTILIZED WERE MADE AVAILABLE BY THE DOMERSET GROUP, INC.

LAKE ONTARIO ORDNANCE WORKS

ACRES

97P-0291-1 2/6/97

FIGURE 2-1 AFP-68 AREA

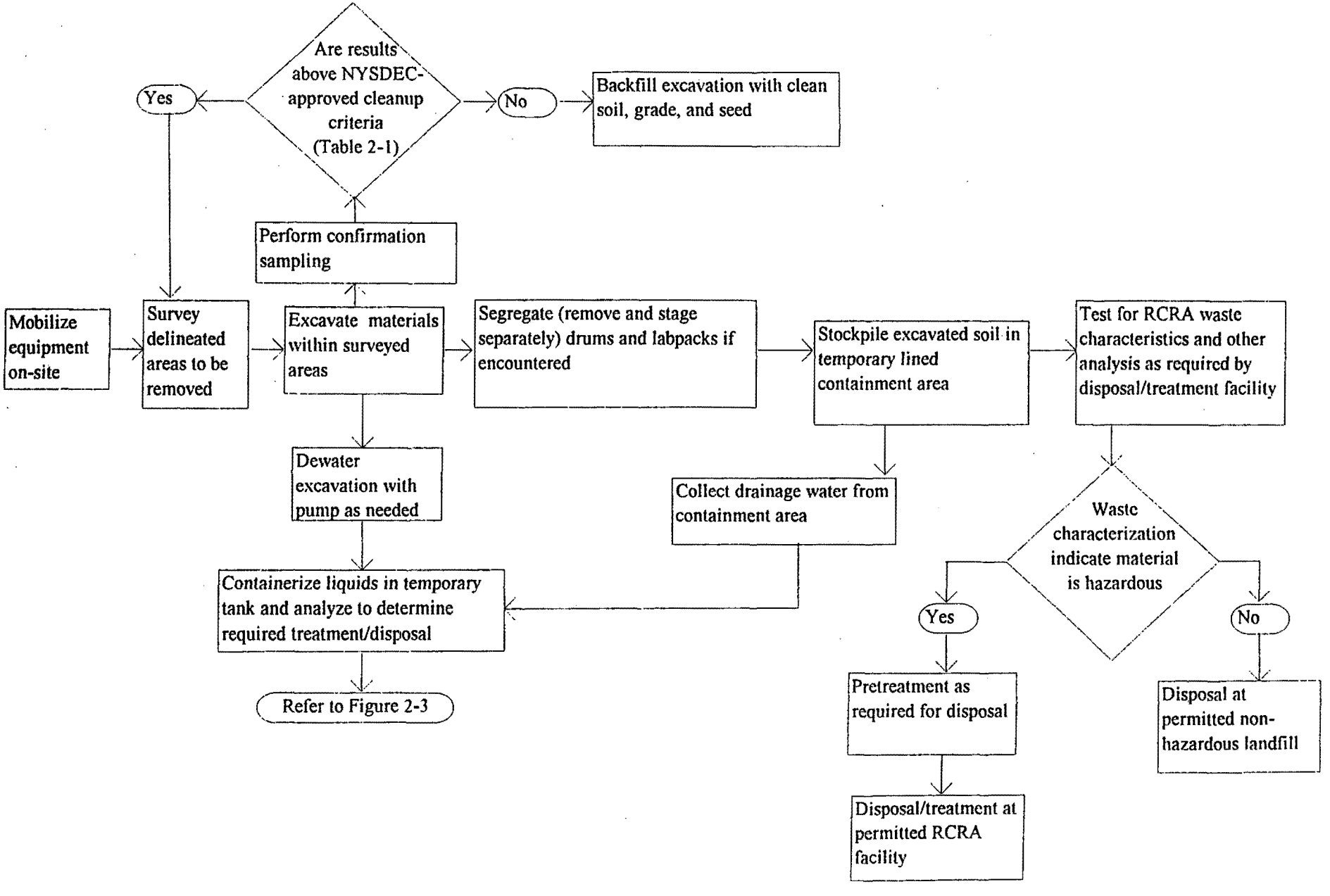
Table 2-1

Area A Constituents of Concern and Cleanup Criteria

Constituent	Maximum Concentration (mg/kg)	NYSDEC* Recommended Soil Cleanup Objective (mg/kg)	Maximum Field Screening Method
Volatile Organics			
Acetone	.99	0.2	PID/FID
Metals			
Zinc	71	50	None

*NYSDEC, Division of Hazardous Waste Remediation, TAGM HWR-94-4046, "Determination of Soil Cleanup Objectives and Cleanup Levels."
PID = Photoionization detector.
FID = Flame ionization detector.

Figure 2-2
Area A and B Remov: :ion Flow Diagram



required to maintain the roadway open during required active periods. Any pavement requiring removal should be saw-cut to minimize the extent of removal and disturbance to adjacent pavement. The Contractor shall coordinate all traffic control with CWM.

2.1.4 Erosion and Sedimentation Control

Temporary erosion and sedimentation controls will be installed and maintained during the entire excavation and backfilling process to prevent the migration of disturbed soils and sediment to downgradient areas of the site. Primarily silt fence, hay bales, and rock construction entrances will be used to fulfill this function. Specific controls and locations to properly control the runoff are shown on the erosion and sedimentation control plans for Area A. Diversion berms and/or channels, rock check dams, or other temporary measures will be used where appropriate and are shown on the design drawings. Stormwater that has come in contact with contaminated soil will be contained and pumped into a temporary containment vessel (i.e., tank truck or temporary tank) for transport and proper treatment/disposal. All erosion and sediment controls will be designed and constructed in accordance with New York's Guidelines for Urban Erosion and Sedimentation Control.

In order to expedite the earthwork staging and soil removal, stockpiling locations shall be established prior to the start of the actual remediation activities. In particular, stockpile locations for clean soils and contaminated soils (see Subsection 2.1.6) shall be established in proximity to the perimeter of Area A. These areas are shown on the Preliminary Contract Drawings. Each stockpile area must be prepared with erosion and sedimentation controls to prevent migration of sediments from the area. Contaminated soil stockpile areas will consist of a bermed asphalt pad underlain by a geomembrane liner that is graded to drain to a collection sump. The asphalt stockpile area is designed to contain all liquids that have come into contact with excavated soils.

The soil stockpile area shown on the Preliminary Contract Drawings has been sized to accommodate the estimated volume of soil to be excavated from Areas A and B. The Contractor may construct a smaller stockpile area depending on his anticipated excavation and handling production. The Contractor may use lined roll-offs to stockpile excavated soil; however, the roll-

offs must be placed within a bermed asphalt pad area in order to contain any spills and contact waters. The roll-offs will also require impervious covers to minimize generation of contact waters.

2.1.5 Excavation and Removal of Soils and Drums

As indicated in Subsection 2.1.2, the method of remediation will be removal and disposal. Therefore, contaminated materials within the delineated area will be excavated, stockpiled, tested, and loaded onto trucks for transport to a competitively bid permitted facility. The transporting vehicles shall be loaded and operated in such a manner so as to prevent any spillage or loss of material until it is unloaded at the accepting facility. Requirements for excavation and staging are provided in the contract specifications (Section 02226: Excavation, Staging, and Containerization of Contaminated Soils and Drums - Areas A and B).

Excavation will begin within the previously delineated area shown on the Preliminary Contract Drawings. The area defined in the EE/CA and shown on the design drawings will be surveyed and staked out by the Contractor to establish the initial limits of contamination. Following excavation of material within this initially delineated area, confirmation sampling shall be performed to determine if the limits of the buried drum trench have been reached in accordance with the NYSDEC-approved cleanup criteria. The results of this sampling will be used to determine if further excavation is needed. If confirmation samples reveal contaminants below cleanup criteria, removal of soil from Area A will be terminated and backfilling operations will begin.

All excavation activities shall be planned and executed so as not to disturb any surrounding structures and to minimize impact to existing pavements. Excavation side slopes are the sole responsibility of the excavation Contractor. Side slope declination, shoring, and bracing are, however, subject to inspection and potential modification by the Contracting Officer in order to minimize the amount of extraneous soil excavated or shoring materials used that may have to be disposed of as hazardous or nonhazardous material. Remote sampling is the preferred technique for confirmation sampling of excavations greater than 4 ft to avoid additional excavation required for sloping. However, if a need should arise for personnel to enter the excavation for drum removal, the working area slopes should be cut to inclinations approved by the federal

Occupational Safety and Health Administration (OSHA) requirements of 29 CFR Part 1926 to provide for safe working conditions. Cut slope inclinations in these instances must be designed by a qualified civil or geotechnical engineer. Sheeting and shoring of excavation sidewalls, if needed to protect construction personnel or existing nearby structures (e.g., utilities or roadways), should be designed and constructed and also must conform to federal OSHA requirements.

The Contractor will receive payment on a per cubic yard basis based on a survey of the excavation when the cleanup criteria have been met or a physical limitation (clay layer) has been encountered. The survey shall be performed by an independent surveyor registered in the State of New York.

The results of previous investigations indicate that many, if not most, of the drums encountered in the test pits were crushed, broken, and deteriorated. Therefore, most, and possibly all, of the drums encountered will not be intact. Crushed, broken, and deteriorated drums that no longer contain any liquid shall be segregated from soil and disposed of separately.

If any intact drums are encountered, they will be excavated by hand to minimize damage to the existing drum and to prevent uncontrolled releases. Drums that have been completely excavated will be removed from the excavation area using a canvas hoist attachment (or approved equivalent removal technique) and transferred to the drum staging area. The staging area will be constructed prior to commencing any excavation activities and shall consist of a bottom impervious liner and bermed or walled perimeter for liquid containment to prevent the migration of materials from uncontrolled releases.

The drum contents will be sampled and analyzed to determine the characteristics of the contents. Intact drums will be overpacked, to prevent uncontrolled releases, and properly labeled for transport.

The contents of leaking intact drums in the staging or excavation area will be transferred into new drums to prevent further migration of released contents. Any spilled material in the staging area will be remediated immediately after transferring the drum contents.

During excavation operations, the Contractor must enforce all health and safety regulations applicable to the construction including, but not limited to, dust control, hearing and vision protection, protective headwear, and appropriate level of personal protective equipment (PPE). Requirements for health and safety are presented in the contract specifications (Section 01110: Safety, Health, and Emergency Response (HTRW/UST)). The CWM administrative building is located northeast of Area A. Strict dust controls and air monitoring of the work area and perimeter shall be performed by the Contractor during excavation activities.

2.1.6 Soil Stockpiling

Soil stockpiling and staging locations must be constructed prior to moving any soils on-site. Two storage/stockpile areas will be required for Area A (Section 02226: Excavation, Staging, and Containerization of Contaminated Soils and Drums - Areas A and B). One stockpile area will be used to stage contaminated soils awaiting disposal, and the other stockpile area will be used to store clean soils that will be used as backfill.

These two stockpile locations will be situated in close transporting distance to the excavation area. The contaminated soil stockpile area will be constructed with a liner and drainage collection system to contain all liquids in contact with the contaminated soil and to prevent migration of contaminated soil or sediment. Migration of any type of contaminant is not permitted. It will be the responsibility of the Contractor to ensure that no migration from the contaminated stockpile area occurs. A configuration of an asphalt pad with a geomembrane liner contained by concrete median barriers has been presented on the 60% design plans. Soils placed within the stockpile area must also be covered with an appropriate type of temporary liner to shed rainfall. A sump or low point has been incorporated into the containment area as a means of collecting liquids for treatment and discharge (see Subsection 2.1.7). Lined roll-offs may also be used to stockpile soils prior to off-site transport and disposal. Roll-offs must remain in the bermed asphalt staging area until off-site transport in order to contain any spillage or contact water. Contact water shall be minimized by providing impermeable covers for the roll-offs.

The second area located to the west of Area B will be used to store imported clean soil for backfilling, as well as topsoil necessary to restore the area to final grades. Containment of liquids is not necessary as long as the runoff is free of soil and sediments. A row of silt fencing and gravel filters surrounding the stockpile is a suitable method of erosion control for the clean soil stockpile.

After removal of the asphalt soil stockpile area, the Contractor must perform confirmation sampling in this area to confirm that there has been no migration of contaminants from this soil storage area. If any contamination above the cleanup criteria is detected within the stockpile area, the Contractor will remove impacted soils that exceed the cleanup criteria at no additional cost to the Government. The Contractor shall collect soil samples from the stockpile area prior to its construction to document existing conditions. Drawings of the Area A Erosion and Sedimentation Controls show acceptable locations of these stockpile areas. The Contractor must provide a drawing showing designated stockpile areas prior to mobilization.

2.1.7 Groundwater and Stormwater Control

Perched groundwater infiltration into and stormwater ponding within excavations may be encountered during construction activities. If perched groundwater is encountered, it is believed that this inflow can be sufficiently controlled by proper grading of the excavation bottoms in combination with localized pumping from a sump at a designated excavation low point. The pumped water shall be routed into tank truck(s) or temporary storage tanks if the volume of collected water is greater than the capacity of the trucks available. The stored water shall then be analyzed to determine its characteristics for treatment/disposal at an aqueous treatment facility. The preferred disposal option for both contact stormwater and groundwater seepage into excavations is treatment/disposal at a competitively bid off-site (or on-site CWM) permitted treatment/disposal facility. Treatment on-site by the Contractor and discharge to an existing stormwater channel, if the water quality meets permit requirements, is an option available to the Contractor. If surface water discharge is proposed on CWM property, the effluent would have to meet CWM SPDES permit effluent limitations and monitoring requirements. All discharge activities will be coordinated with CWM and the Contracting Officer. The Contractor is

recommended to establish stormwater diversions to direct noncontact stormwater to applicable on-site stormwater channels.

Requirements for the collection, characterization, treatment, and discharge of liquid from dewatering activities are presented in the contract specifications (Section 02141: Dewatering Liquids and Handling). Diversion channels and/or berms shall also be constructed as necessary to divert stormwater run-on away from excavations.

2.1.8 Controlled Fill

Controlled fill will be required as backfill and final site grading fill. Requirements for controlled fill are presented in the contract specifications (Section 02210: Backfill and Grading for Remediation Areas). Off-site borrow material imported to the site for use as excavation backfill must be tested in accordance with the contract specifications (Section 02210) to ensure it is environmentally clean and meets the physical properties required in the specifications.

Fill compacted with heavy compaction equipment will be placed in approximately 8- to 10-inch (loose thickness) horizontal lifts. Fill to be compacted using hand-operated vibratory plate compactors (e.g., "jumping jacks") will be placed in maximum 6-inch (loose thickness) lifts. Nonstructural backfill materials will be compacted to at least 90% of the maximum Standard Proctor compaction test (ASTM D-698). Structural backfill materials shall be compacted to at least 95% of the maximum Standard Proctor compaction tests. A heavy (10-ton static weight) self-propelled vibratory roller (sandy soils) or sheepsfoot roller (clayey soils), shall be used to compact backfill soils, except at locations within 5 ft from existing structures and utilities. Lighter, walk-behind compaction equipment shall be used to compact fill soils within these locations.

Prior to removal of erosion and sedimentation controls, the site shall be graded to match adjacent topography and prevent ponding of surface water. In order to finalize site restoration, an appropriate seed and mulch (Section 02935: Turf) shall be placed over the disturbed area. Upon germination and establishment of the vegetation, site erosion controls will be removed.

2.1.9 Disposal of Materials

Where applicable, the containerization of all hazardous materials will be completed according to contract specifications (Section 02226: Excavation, Staging, and Containerization of Contaminated Soils and Drums - Areas A and B). All hazardous materials will be transported and disposed of according to contract specifications (Section 02120: Transportation and Disposal of Hazardous and Non-Hazardous Materials).

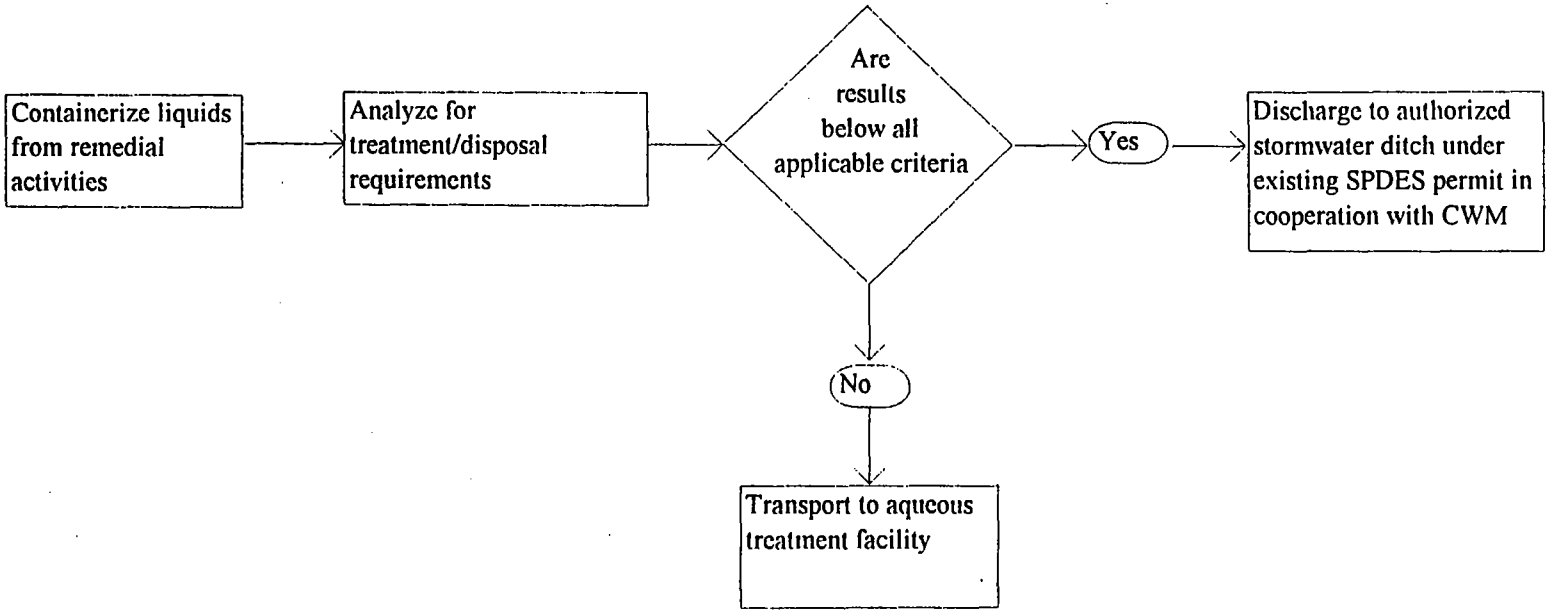
Water

All water that comes in contact with potentially contaminated soils, including surface water runoff, groundwater infiltration, and water ponded as a result of a storm event will be collected in a tank truck or temporary storage tanks. The water will be sampled and analyzed to determine specific treatment requirements prior to treatment/disposal or direct discharge on-site (see Figure 2-3, Flow Diagram for Aqueous Treatment). The preferred method is transport to and disposal of all contact waters at a permitted treatment facility. The results from the PRDI can be submitted for waste acceptance; however, the accepting facility may request additional information. The Contractor has the option to discharge the water on-site to CWM stormwater channels if the water meets applicable discharge limits and monitoring requirements. If the water does not meet regulatory limitations, then the Contractor must dispose of the water at a permitted facility or treat the water on-site until discharge limitations are met.

Soils

The stockpiled material will be sampled and analyzed to determine waste classification. Analysis shall consist of RCRA waste characteristics to determine whether the stockpiled material is hazardous or nonhazardous in accordance with 40 CFR 261 and 6NYCRR Part 371, and other analyses as required by the accepting facility. Soils classified as hazardous, as identified in 40 CFR 261 and 6NYCRR Part 371, will be disposed of at a competitively bid permitted RCRA hazardous waste facility. Soils classified as nonhazardous will be disposed of at a 6NYCRR Part 360 permitted landfill. On-site reduction of moisture content through stabilization or other

Figu 3
Aqueous Treatment Flow Diagram



techniques to meet the requirements of the accepting facility may be completed by the Contractor. Chemical stabilization, pretreatment, etc., will be performed by the accepting facility.

2.1.10 Confirmation Sampling

Confirmation sampling will be conducted by the Contractor to verify the removal of contaminated material to the established NYSDEC-approved cleanup criteria. The Contracting Officer or his representative will provide quality assurance (QA) oversight of the Contractor's sampling and analysis program. Requirements for confirmation sampling are provided in the contract specifications (Section 02010: Confirmation and Verification Sampling). Remote sampling is the preferred technique for confirmation sampling of excavations greater than 4 ft to avoid additional excavation required for sloping. The Contractor shall provide the necessary manpower, equipment, and materials to obtain confirmation samples from the excavation.

Confirmation sampling will be performed after the excavation has reached the designated limits of Area A and initial field screening does not indicate elevated concentrations of organic compounds. Initial field screening methods may consist of PID/FID field instruments or other acceptable field screening methods. If sustained field screening readings above background are observed on soil samples removed from the excavation, the contracting officer may direct the contractor to continue excavation or perform confirmation sampling. For the excavation walls a grid area of 400 ft^2 (10-ft by 40-ft narrow sidewall) to 550 ft^2 (10-ft by 55-ft long sidewall) or a total of 20 sidewall samples is specified to be collected and analyzed using rapid (24 hours or less) turnaround analysis. Samples will be collected in the center of each grid section. The bottom of Area A will be excavated to the depth cleanup criteria are met (estimated at 10 ft) or to 6 inches below the top of the clay layer, whichever comes first. It is recommended that confirmation samples be performed on the bottom of the excavation to document the level of cleanup, in the case that the clay layer is encountered first. The results would not be used to extend the depth of the excavation if the clay layer is encountered. A grid area of approximately 1,100 ft^2 (20 ft by 55 ft) or eight total floor samples is specified. The total confirmation samples would, therefore, be 28, if no sample exceeded the cleanup criteria and no additional excavation beyond the initial limits were performed. The contaminants detected above NYSDEC recommended soil cleanup

levels in soils from Area A include acetone and zinc. The confirmation sample results will be compared to the NYSDEC soil cleanup levels presented in Table 2-1.

QA split verification samples shall be collected for at least 20% of the confirmation samples. Verification samples are to be analyzed at an independent, approved laboratory.

Removal activities will continue until confirmation results are below the levels indicated in Table 2-1. If the confirmation results exceed the soil cleanup levels, excavation will continue in 2-ft to 4-ft vertical sections (wall) and 1-ft horizontal lifts (floor), as directed by the Contracting Officer, until confirmation sample results are below the specified cleanup levels for the contaminants listed levels listed in Table 2-1.

2.2 AREA B REMEDIATION

Area B is located southeast of the intersection of Balmer Road and Lutts Road within the OU No. 1 on the former LOOW site (see Figures 1-1 and 1-2). The western limits of Area A are within 200 ft of the southeast corner of Area B. The footprint of Area B has been estimated at approximately 280 ft by 200 ft. A burn pit located in the southern portion of Area B dates back to 1963. Two large surface depressions exist within the former burn pit. The remediation areas within Area B were investigated and identified during an inspection by SCA in 1981 (EE/CA, Acres, March 1995).

2.2.1 Site Background

Aerial photographs dating back to 1963 indicate that the burn pit activities were apparently concentrated in the southern portion of Area B, just north of H Street. Two rectangular depressions also existed within the pit and are shown in Figure 2-1. One of these depressions measures approximately 200 ft long by 15 ft wide and is located in the northern portion of the former burn pit. The second surface depression measured approximately 100 ft long by 25 ft wide and was located in the southeast corner of Area B. During the construction of SLF-7, H Street was relocated about 25 ft north of its former location. This northern relocation of H Street

appears to have resulted in the elimination of this second surface depression (EE/CA, Acres, March 1995).

The pond sediment samples displayed the highest concentrations of contaminants detected in Area B. The contaminants were predominantly benzene derivatives (e.g., chlorobenzene, ethylbenzene, styrene, and 1,2,4-trichlorobenzene) and are distinctly different from the contaminants detected elsewhere in Area B. For example, subsurface soil samples collected from the area south of the bermed pond displayed elevated levels of carbon tetrachloride, hexachloroethane, and tetrachloroethene (EE/CA, Acres, March 1995).

Based on the investigation results obtained to date, it appears that separate source areas exist in Area B. The sediment within the pond in Area B is contaminated with heterocyclic and aromatic compounds. Visual observations of the sediment identified the presence of deteriorated drums and labpack materials (EE/CA, Acres, March 1995). This contamination appears to be limited to the upper few feet of sediment because subsurface soil samples did not contain significant contamination at depth. Because the berms were constructed of locally derived materials, it is assumed that the berms are also contaminated. The contaminants detected in the subsurface soils and groundwater to the south of Area B were primarily chlorinated organics such as tetrachloroethene. Because of the differences in the types of contamination detected to the area south of Area B (source "Zone" 2) and those contaminants detected within the bermed pond in Area B (source "Zone" 1), the occurrences of these different contaminants may represent separate source areas within Area B. These separate sources are identified as Zone 1 and Zone 2 in Figure 2-1. It appears the contamination south of Area B may be related to the possible use of the former surface depression for wastewater storage and as a burn pit (EE/CA, Acres, March 1995). The contaminants that were detected above the NYSDEC cleanup criteria in Area B are presented in Table 2-2.

Based on information gathered to date, the following materials have been identified for remediation (EE/CA, Acres, March 1995):

- Zone 1—Contaminated pond sediment estimated at approximately 3,000 yd^3 (based on a 24,500-ft^2 area 3 ft in depth).

Table 2-2

Area B Constituents of Concern and Cleanup Criteria

Constituent	Maximum Concentration (mg/kg)	NYSDEC* Recommended Soil Cleanup Objective (mg/kg)	Maximum Field Screening Method
Zone 1 Volatile Organics			
Methylene Chloride	6.5	.1	PID
Benzene	.27	.06	PID/FID
Chlorobenzene	1.8	1.7	PID/FID
Ethylbenzene	7.3	5.5	PID/FID
Semivolatile Organics			
1,2,4-Trichlorobenzene	.35	3.4	PID/FID
Pesticides			
Aldrin	.041	.041	None
alpha-BHC	1.2	.11	None
Dieldrin	.93	.044	None
Heptachlor epoxide	.039	.02	None
Zone 2 Volatile Organics			
Acetone	.8	.2	PID/FID
Carbon Tetrachloride	4.5	.6	PID
Tetrachloride	11	1.4	PID/FID

*NYSDEC, Division of Hazardous Waste Remediation, TAGM HWR-94-4046, "Determination of Soil Cleanup Objectives and Cleanup Levels."
PID = Photoionization detector.
FID = Flame ionization detector.

- Zone 1—Contaminated berm materials at approximately 6,000 yd^3 (based on 33,000 ft^2 of berm at an average height of 5 ft).

- Zone 1—Contaminated mounded sediment and soil within the ponded area estimated at 1,300 yd^3 (based on a 7,150-ft^2 area with an average thickness of 5 ft).

- Zone 2—Contaminated soils within the former surface depression south of the present burn pit boundaries, estimated at 1,700 yd^3 (based on the depression dimensions of 100 ft long by 25 ft wide by 18 ft deep).

- Locally contaminated groundwater from within the former surface depression, estimated at 120,000 gallons (based on the groundwater at 3 ft bgs resulting in 83% of the volume of the trench within the saturated zone and an estimated porosity of 40% for the trench materials). The existence of contaminated groundwater beyond the excavation trench is not considered part of this removal action. (Remedial Design for Interim Removal Actions Operable Units 1 and 2 LOOW - Work Plan, August 1996)

It is the preferred option to treat the ponded water at a permitting treatment facility. All discharge activities will be coordinated with CWM and the Contracting Officer.

The Contractor has the option to discharge the ponded water on-site to CWM stormwater channels if the water meets applicable discharge limits and monitoring requirements. If the water does not meet regulatory limitations, then the Contractor must dispose of the water at a permitted facility or treat the water on-site until discharge limitations are met.

2.2.2 Preferred Removal Action

The removal action recommended in the EE/CA is the removal and disposal alternative in which the contaminated materials within the delineated areas shown in Figure 2-1 in Area B would be excavated by backhoe or excavator and transported for disposal at a competitively bid permitted facility (see Figure 2-2 for Area B removal action flow diagram). Excavation will be performed within the limits shown in Figure 2-1 based on the results of previous investigations. Confirmation soil sampling will be conducted once these limits of the excavation have been reached or as directed by the Contracting Officer to verify that contaminated material removal has been completed to established cleanup criteria standards. Further details of this remedial action are outlined in the following subsections.

2.2.3 Site Preparation

Prior to commencing site excavation in the designated removal areas within Area B, all vegetation, topsoil, and rootmass will be removed from within the limits of the proposed excavation. Requirements for site preparation are provided in the contract specifications (Section 02110: Clearing and Grubbing). Topsoil will be temporarily stockpiled at a designated location for site revegetation at the completion of removal activities. Stockpiled topsoil will be sampled prior to placement for site revegetation. All subsurface utility lines, currently located within and along the limits of work, will be either relocated outside the limits of work or clearly identified so as to avoid their damage by, and interference with, earthwork-related construction activities. Area B is located adjacent to an active access road used by CWM. Area B and the adjacent road are located within an active RCRA TSDF facility. Complete closure of this roadway during excavation operations shall be restricted to a Friday to Monday time period with full access available to CWM by Tuesday morning. Partial (one lane) or full closures shall be limited and coordinated with CWM. Temporary sheeting and shoring may be required to maintain the roadway open during required active periods. Any pavement requiring removal should be saw-cut to minimize the extent of removal and disturbance to adjacent pavement. The Contractor shall coordinate all traffic control with CWM.

2.2.4 Erosion and Sedimentation Controls

Temporary erosion and sedimentation controls will be installed and maintained during the entire excavation and backfilling process to prevent the migration of disturbed soils and sediment to downgradient areas of the site. Primarily silt fence, hay bales, and rock construction entrances will be used to fulfill this function. Specific controls and locations to properly control the runoff are shown on the erosion and sedimentation control plans for Area B. Diversion berms and/or channels, rock check dams, or other temporary measures will be used where appropriate and are shown on the design drawings. Stormwater that has come in contact with contaminated soil will be contained and pumped into a temporary containment vessel (i.e., tank truck or temporary tank) for transport and proper treatment/disposal. All erosion and sediment controls will be designed

and constructed in accordance with New York's Guidelines for Urban Erosion and Sedimentation Control.

In order to expedite the earthwork staging and soil removal, stockpile locations shall be establish prior to the start of the actual remediation activities. In particular, stockpile locations for clean soils and contaminated soils (see Subsection 2.2.6) shall be established in proximity to the perimeter of Area B. These areas are shown on the Preliminary Contract Drawings. Each stockpile area must be prepared with erosion and sedimentation controls to prevent migration of sediments from the area. Contaminated soil stockpile areas will consist of a bermed asphalt pad underlain by a geomembrane liner that is graded to drain to a collection sump. This asphalt stockpile area is designed to contain all liquids that have come into contact with excavated soils.

The soil stockpile area shown on the Preliminary Contract Drawings has been sized to accommodate the estimated volume of soil to be excavated from Areas A and B. The Contractor may construct a smaller stockpile area depending on his anticipated excavation and handling production. The Contractor may use lined roll-offs to stockpile excavated soil; however, the roll-offs must be placed within a bermed asphalt pad area in order to contain any spills and potential contact waters. The roll-offs will also require impervious covers to minimize generation of contact waters.

2.2.5 Excavation and Removal of Soils and Drums/Labpacks

As indicated in Subsection 2.2.2, the method of remediation will be removal and disposal. Therefore, contaminated materials within the delineated area will be excavated, stockpiled, tested, and loaded onto trucks for transport to a competitively bid permitted facility. The transporting vehicles shall be loaded and operated in such a manner so as to prevent any spillage or loss of material until it is unloaded at the accepting facility. Requirements for excavation and staging are provided in the contract specifications (Section 02226: Excavation, Staging, and Containerization of Contaminated Soils and Drums - Areas A and B).

Excavation will begin within the area of the two surface depressions within the burn pit area shown on the Preliminary Contract Drawings. First, the area must be surveyed to establish the

initial limits of contamination. Following excavation of material within this initially delineated area, confirmation sampling shall be performed to determine if the contaminated material limits have been reached in accordance with the NYSDEC-approved cleanup criteria. The results of this sampling will be used to determine if further excavation is needed. If confirmation samples reveal contaminants below cleanup criteria, removal of soil from Area B will be terminated and backfilling operations will begin.

All excavation activities shall be planned and executed so as not to disturb any surrounding structures and to minimize impact to existing pavements. Excavation side slopes are the sole responsibility of the excavation Contractor. Side slope declination, shoring, and bracing are, however, subject to inspection and potential modification by the Contracting Officer in order to minimize the amount of extraneous soil excavated or shoring materials used that may have to be disposed of as hazardous or nonhazardous material. Remote sampling is the preferred technique for confirmation sampling of excavations greater than 4 ft to avoid additional excavation required r sloping. However, if a need should arise for personnel to enter the excavation for drum/labpack removal, the working area slopes should be cut to inclinations approved by the federal OSHA requirements of 29 CFR Part 1926 to provide for safe working conditions. Cut slope inclinations in these instances must be designed by a qualified civil or geotechnical engineer. Sheeting and shoring of excavation sidewalls, if needed to protect construction personnel or existing nearby structures (e.g., utilities or roadways), should be designed and constructed and also must conform with federal OSHA requirements.

The Contractor will receive payment on a cubic yard basis based on a survey of the excavation when the cleanup criteria have been met or a physical limitation (clay layer) has been encountered. The survey shall be performed by an independent surveyor registered in the State of New York.

The results of previous investigations indicate that many, if not most, of the drums encountered in the test pits were crushed, broken, and deteriorated. Therefore, most, and possibly all, of the drums encountered will not be intact. Crushed, broken, and deteriorated drums that no longer ntain any liquid shall be segregated from soil and disposed of separately.

If any intact drums/labpacks are encountered, then they will be excavated by hand to minimize damage to the existing drums/labpacks and prevent uncontrolled releases. Drums that have been completely excavated will be removed from the excavation area using a canvas hoist attachment (or other approved equivalent removal technique) and transferred to the drum staging area. The staging area will be constructed prior to commencing any excavation activities and shall consist of a bottom impervious liner and bermed or walled perimeter for liquid containment to prevent the migration of materials from uncontrolled releases.

The drum contents will be sampled and analyzed to determine the characteristics of the contents. Intact drums will be overpacked to prevent uncontrolled releases and properly labeled for transport.

The contents of leaking intact drums in the staging or excavation area will be transferred into new drums to prevent further migration of released contents. Any spilled material in the staging area will be remediated immediately after transferring the drum contents.

During excavation operations, the Contractor must enforce all health and safety regulations applicable to the construction including, but not limited to, dust control, hearing and vision protection, protective headwear, and appropriate level of PPE. Requirements for health and safety are presented in the contract specifications (Section 01110: Safety, Health, and Emergency Response (HTRW/UST)). The CWM administrative building is located northeast of Area A. Strict dust controls and air monitoring of the work area and perimeter shall be performed by the Contractor during excavation activities.

2.2.6 Soil Stockpiling

Soil stockpiling and staging locations must be constructed prior to moving any soils on-site. Two storage/stockpile areas will be required for Area B (Section 02226: Excavation, Staging, and Containerization of Contaminated Soils and Drums - Areas A and B). One stockpile area will be used to stage contaminated soils awaiting disposal, and the other stockpile area will be used to store clean soils that will be used as backfill.

These two stockpile locations will be situated in close transporting distance to the excavation area. The contaminated soil stockpile area will be constructed with a liner and drainage collection system to contain all liquids in contact with the contaminated soil and to prevent migration of contaminated soil or sediment. Migration of any type of contaminants is not permitted. It will be the responsibility of the Contractor to prevent migration from the contaminated stockpile area. A configuration of an asphalt pad with a geomembrane liner contained by concrete median barriers has been presented on the 60% design plans. Soils placed within the stockpile area must also be covered with an appropriate type of temporary liner to shed rainfall. A sump has been incorporated into the containment area as a means to collect liquids for treatment and discharge (see Subsection 2.2.7). Lined roll-offs may also be used to stockpile soils prior to off-site transport and disposal. Roll-offs must remain in the bermed asphalt staging area until off-site transport, in order to contain spillage or contact water. Contact water shall be minimized by providing impermeable covers for the roll-offs.

The second area located to the west of Area B will be used to store imported clean soil for backfilling, as well as topsoil necessary to restore the area to final grades. The intent of the clean soil stockpile is to prevent sediment from migrating from the soil pile location. Containment of liquids is not necessary as long as the runoff is free of soil and sediments. A row of silt fencing and sand gravel filters surrounding the stockpile is a suitable method of erosion control for the clean soil stockpile.

After removal of the asphalt soil stockpile area, the Contractor must perform confirmation sampling in this area to confirm that there has been no migration of contaminants from this soil storage area. If any contamination above the cleanup criteria is detected within the stockpile area, the Contractor will remove impacted soils that exceed the cleanup criteria at no additional cost to the Government. The Contractor shall collect soil samples from the stockpile area prior to its construction to document existing conditions. Drawings of the Area B Erosion and Sedimentation Controls will show acceptable locations of these stockpile areas. The Contractor must provide a drawing showing designated stockpile areas prior to mobilization.

2.2.7 Groundwater and Stormwater Control

Perched groundwater infiltration into and stormwater ponding within excavations may be encountered during construction activities. If perched groundwater is encountered, it is believed that this inflow can be sufficiently controlled by properly grading the excavation bottoms in combination with localized pumping from a sump at a designated excavation low point. The pumped water shall be routed into tank truck(s), or temporary storage tanks if the volume of collected water is greater than capacity of the trucks available. The stored water shall then be analyzed to determine its characteristics for transport/disposal at an aqueous treatment facility. Treatment at a competitively bid off-site or CWM's on-site facility is the preferred approach for contact stormwater and groundwater seepage into excavations. Treatment on-site by the Contractor and discharge to an existing stormwater channel if the water quality meets CWM permit requirements, is an option available to the Contractor. If surface water discharge is proposed on CWM property, the effluent would have to meet CWM SPDES permit effluent limitations and monitoring requirements. All discharge activities must be coordinated with CWM through the Contractor Officer. The Contractor is recommended to establish stormwater diversions to direct noncontact stormwater to applicable on-site stormwater channels.

Requirements for the collection, characterization, treatment, and discharge of liquid from dewatering activities are presented in the contract specifications (Section 02141: Dewatering Liquids and Handling). Diversion channels and/or berms shall also be constructed as necessary to divert stormwater run-on away from excavations.

2.2.8 Controlled Fill

Controlled fill will be required as backfill and final site grading fill. Requirements for controlled fill are presented in the contract specifications (Section 02210: Backfill and Grading for Remediation Areas). Off-site borrow material imported to the site for use as excavation backfill must be tested in accordance with the specifications (Section 02210) to ensure it is environmentally clean and meets the physical properties required in the specifications.

Fill compacted with heavy compaction equipment shall be placed in approximately 8- to 10-inch (loose thickness) horizontal lifts. Fill to be compacted using hand-operated vibratory plate compactors (e.g., "jumping jacks") shall be placed in maximum 6-inch (loose thickness) lifts. Nonstructural backfill materials shall be compacted to at least 90% of the maximum Standard Proctor compaction test (ASTM D-698). Structural backfill materials shall be compacted to at least 95% of the maximum Standard Proctor compaction test. A heavy (10-ton static weight) self-propelled vibratory roller (sandy soils) or sheepsfoot roller (clayey soils) shall be used to compact fill soils at locations at least 5 ft from existing structures and utilities. Lighter, walk-behind compaction equipment shall be used to compact fill soils within 5 ft of these locations.

Prior to removal of erosion and sedimentation controls, the site shall be graded to match adjacent topography and prevent ponding of surface water. In order to finalize site restoration, an appropriate seed and mulch (Section 02935: Turf) shall be placed over the disturbed area. Upon germination and establishment of the vegetation, site erosion controls will be removed.

2.2.9 Disposal of Materials

Where applicable, the containerization of all hazardous materials will be completed according to contract specifications (Section 02226: Excavation, Staging, and Containerization of Contaminated Soils and Drums - Areas A and B). All hazardous materials will be transported and disposed of according to contract specifications (Section 02120: Transportation and Disposal of Hazardous Materials).

Ponded Surface Water

The ponded water within the depression in Area B could potentially be discharged without treatment. Therefore, the pond water will be carefully removed to a temporary holding tank, to within several inches of the bottom, to avoid disturbing any of the contaminated sediments. Discharge to surface drainage will require meeting all applicable discharge requirements under CWM's current SPDES permit. Discharge of any liquids must be coordinated with CWM.

Analysis of water quality prior to discharge will be performed by the Contractor. Ponded water that is above the permit limits will be treated on-site by the Contractor and then discharged under the CWM SPDES permit or transported to a competitively bid off-site or CWM's on-site treatment facility.

Water

All water that comes in contact with potentially contaminated soils, including surface water runoff, groundwater infiltration, and water ponded as a result of a storm event will be collected in a tank truck or temporary storage tanks. The water will be sampled and analyzed to determine specific treatment requirements prior to treatment/disposal or direct discharge on-site (see Figure 2-3, Flow Diagram for Aqueous Treatment). The results from the PRDI can be submitted for waste acceptance; however, the accepting facility may request additional information. The preferred method is transport to and disposal of all contact waters at a permitted treatment facility. The Contractor has the option to discharge the ponded water on-site to CWM stormwater channels if the water meets applicable discharge limits and monitoring requirements. If the water does not meet regulatory limitations, then the Contractor must dispose of the water at a permitted facility or treat the water on-site until discharge limitations are met.

Soils

The stockpiled material will be sampled and analyzed to determine waste classification. Analysis shall consist of RCRA waste characteristics, to determine whether it is hazardous or nonhazardous in accordance with 40 CFR 261 and 6NYCRR Part 371, and other analyses as required by the accepting facility. Soils classified as hazardous, as identified in 40 CFR 261 and 6NYCRR Part 371, will be disposed of at a competitively bid permitted RCRA hazardous waste facility or an off-site incinerator due to Land Ban criteria. Soils classified as nonhazardous will be disposed of at a 6NYCRR Part 360 permitted landfill. On-site reduction of moisture content through stabilization or other techniques to meet the requirements of the accepting facility may be completed by the Contractor. Chemical stabilization, pretreatment, etc., will be performed by the accepting facility.

2.2.10 Confirmation Sampling

Confirmation sampling will be conducted by the Contractor to verify the removal of contaminated material to the established NYSDEC-approved cleanup criteria. The Contracting Officer or his representative will provide QA oversight of the Contractor's sampling and analysis program. Requirements for confirmation sampling are provided in the contract specifications (Section 02010: Confirmation and Verification Sampling). Remote sampling is the preferred technique for confirmation sampling of excavations greater than 4 ft to avoid additional excavation required for sloping. The Contractor shall provide the necessary manpower, equipment, and materials to obtain the confirmation samples from the excavation. The Contractor is required to provide proper support for all excavations to meet OSHA requirements for access of sampling personnel, if sampling personnel must enter the excavation area. This may include sloping, benching, or other excavation support methods to stabilize the sides of the excavation. **The Contractor will perform this work in a manner that will minimize the amount of extraneous soil excavated or shoring materials used that may have to be disposed of as hazardous waste. Sloping, sharing, and other excavation methods are subject to review and modification by the Contracting Officer to minimize the amount of extraneous soil excavated.**

Confirmation sampling at Area B will be completed as follows:

- Contaminated pond sediment (estimated volume 3,000 yd^3 based on a 24,500-ft^2 area 3 ft in depth)—Following removal of the sediment to a depth of 3 ft, the area will be screened with a FID/PID. If sustained readings above background are observed, the contracting officer may direct the contractor to excavate and remove another foot or collect confirmation samples using an approximately 4,000-ft^2 grid area (five to six samples total). Based on the results of the 24-hour turnaround confirmation sampling, an additional 1 ft or greater as directed by the Contracting Officer of material will be excavated and removed from within the designated grid.

- Contaminated berm materials at approximately 6,000 yd^3 (based on 33,000 ft^2 of berm at an average height of 5 ft)—A similar approach is specified for contaminated pond sediment for a total of eight to nine confirmation samples.

- Contaminated mounded sediment and soil within the ponded area estimated at 1,300 yd^3 (based on a 7,150-ft^2 area with an average thickness of 5 ft)—A similar approach to confirmation sampling is specified for contaminated pond sediment. Following initial excavation to 5 ft below the existing surface, field screening with FID/PID will

be conducted and then either further excavation or confirmation sampling will be performed based on field screening results. Total samples for the first round of confirmation sampling consists of two samples.

- Contaminated soils within the former surface depression south of the present burn pit boundaries, estimated at 1,700 yd^3 (based on the depression dimensions of 100 ft long by 25 ft wide by 18 ft deep). Since this is a below-ground excavation, sidewall and floor confirmation samples are specified. The sidewall confirmation sampling will occur after field screening and will be performed on an approximate grid area of 450 ft^2 (18-ft by 25-ft narrow sidewall) or one sample per side, and of 450 ft^2 (9 ft by 50 ft on long sidewall) or four samples per side. The total sidewall samples will then be 10. The floor samples will be taken using a grid area of 625 ft^2 (25 ft by 25 ft) or four samples. If the clay layer is encountered the excavation will proceed 6 inches into the clay layer and confirmation samples will be collected. No further excavation will occur after the top 6 inches of the clay layer is removed. The results of the confirmation samples at this depth will be used only to document cleanup achieved. If the clay layer is not encountered, excavation will proceed until clean criteria are met (estimated at 18 ft) or the clay layer is encountered.

The contaminants detected above NYSDEC recommended soil cleanup levels in Area B include benzene derivatives (e.g., chlorobenzene, ethylbenzene, styrene, and 1,2,4-trichlorobenzene) in the basin sediments (Zone 1) and primarily chlorinated organics (e.g., carbon tetrachloride, hexachloroethane, and tetrachloroethene) in the subsurface soils and groundwater in the former surface depression (Zone 2); therefore, confirmation samples will be analyzed for the specific compounds for the two different source areas (Zone 1 and Zone 2) as shown in Table 2-2. The confirmation sample results will be compared with the soil cleanup levels presented in Table 2-1.

QA split verification samples shall be collected for at least 20% of the confirmation samples. Verification samples are to be analyzed at an independent, approved laboratory.

Removal activities will continue until confirmation results are below the levels indicated in Table 2-1. If the confirmation results exceed the soil cleanup levels, excavation will continue in 2-ft to 4-ft vertical sections (wall) and 1-ft to 2-ft horizontal lifts (floor) or as directed by the Contracting Officer until confirmation sample results are below the specified cleanup levels for the contaminants listed in Table 2-1.

2.3 CHEMICAL WASTE SEWER SYSTEM AND LIFT STATIONS

2.3.1 Site Background

The chemical waste sewer system located on the Somerset and CWM properties was determined during the RI to contain numerous contaminants at substantial concentrations. Based on past observations of liquid levels within the lift stations, it appears that the liquid levels are constant and do not represent groundwater levels. This would imply that the contaminants may be confined within the sewer system. The portions of the sewer system to be addressed include the chemical waste lift stations (typically 10 ft by 10 ft by 10.5 ft) in Areas 4, 7, 8, 22, 31, and adjacent to the oil/water separator in Area 24 North; and associated interconnecting sewer lines. Based on available site drawings, the sewer lines range in size from 4 to 6 inches in diameter. Any contamination beyond the confines of the sewer system will be addressed in future investigations.

Based on field observations and information obtained from the drawings, the following materials are identified for remediation:

- Contaminated liquid and sludge within the chemical waste lift stations estimated at 29,000 gallons of sewage and 2 yd^3 of sludge.
- Contaminated liquid and sludge within the interconnecting sewer lines estimated at 1,000 gallons of sewage and 2 yd^3 of sludge.

It is assumed that only sewage and sludge materials within the chemical waste sewer system lift stations and main trunklines will be remediated at this time. It is also assumed that the remediation will not include any materials within the system downgradient of the oil/water separator in Area 24.

2.3.2 Preferred Removal Action

The removal action recommended in the EE/CA is the removal of the accumulated water and sludges from the chemical lift stations. After removal of the liquids and sludges, the chemical lift stations and trunklines will be cleaned by high-pressure water jets to remove any sediment collected in the sewer pipelines. All water collected will be disposed of at the on-site aqueous

treatment facility and sludges transferred to an existing permitted incinerator for disposal. Upon completion of solids removal and cleaning, the chemical lift stations will be sealed at the ground surface. Requirements for the remediation of the chemical sewer line are provided in the contract specifications (Section 02142: Remediation of Chemical Waste Sewers and Lift Stations).

2.3.3 Liquid Removal

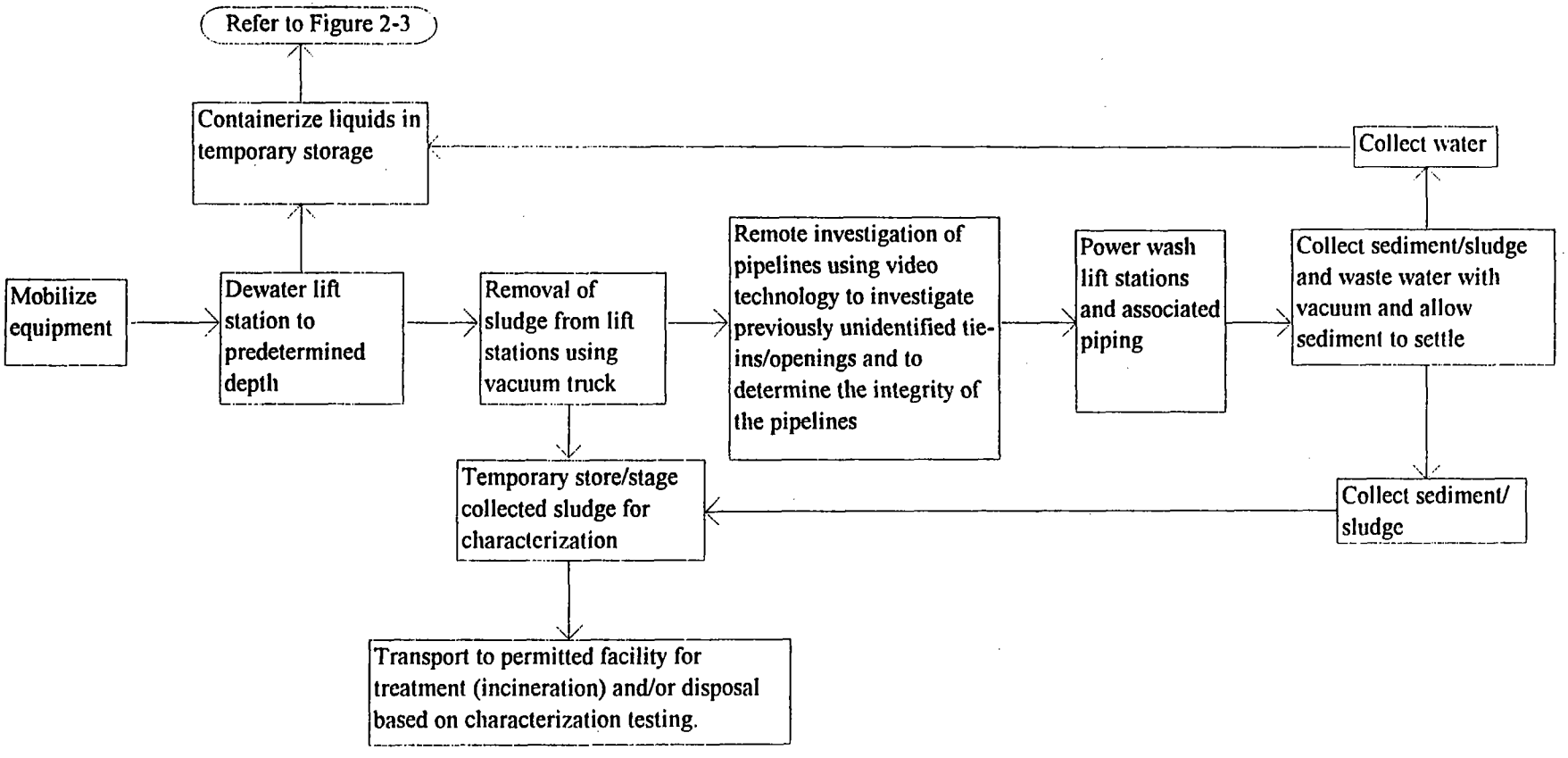
The Contractor will initially remove the contaminated liquids from the chemical waste sewer system and lift stations. The chemical waste lift stations (typically 10 ft by 10 ft by 10.5 ft) can be used as sumps during removal activities. The liquids will be pumped from the chemical lift stations into a temporary storage vessel (i.e., tanker truck or temporary tank), and sampled and analyzed to determine specific treatment/disposal requirements. The liquids within the lift stations will not be completely removed to avoid mixing and removal of the contaminated bottom sludge. The liquids will be stored until the results of the analysis are available. (See Figure 2-4 for Removal Flow Diagram.)

Upon characterization of the liquids and determination of treatment/disposal requirements, the stored liquids will be transported by a licensed waste hauler to a competitively bid permitted treatment/disposal facility. Transportation and disposal requirements for liquids are provided in the contract specifications (Section 02120: Transportation and Disposal of Hazardous and Non-Hazardous Materials).

2.3.4 Removal of Sludges from Lift Stations

After the liquids in the Chemical Waste Sewer Lift Stations have been pumped down to a predetermined depth, the sediments in the lift stations will be removed by vacuum and containerized. Due to Land Ban considerations, incineration may be the only treatment option available. Transportation and disposal requirements for sediments will be provided in the contract specifications (Section 02120: Transportation and Disposal of Hazardous and Non-Hazardous Materials). The Contractor will be responsible for performing any necessary sampling and analysis and stabilization of sludges as required by the accepting facility.

Figu 4
Chemical Waste Sewer System and Lift Stations Removal Action Flow Diagram



2.3.5 Identification of Potential Tie-Ins and Pipeline Integrity

Prior to removal of sediment by high-pressure water jets from the chemical waste sewer system, the Contractor will be required to investigate previously unidentified tie-ins and determine the integrity of the sewer pipeline through remote methods such as a pipeline (downhole) videocamera or other approved methods. The purpose of this remote investigation is to identify potential openings in the pipeline that could lead to a release of contaminants during flushing activities.

2.3.6 Power Washing the Sewer System

The chemical sewer system will be power washed with a high-pressure water, pipe washing system. The power wash system shall be capable of effectively removing sediments from the pipeline and clean the inner surfaces of the pipe without causing damage to the pipeline. The power wash system shall also be capable of removing debris that may stop the forward travel of the washer system.

The Contractor will power wash the sewer pipeline in specified intervals. Specified intervals will consist of sewer pipeline sections located between chemical lift stations. When a section has been power washed, the Contractor will proceed toward the next chemical sewer lift station and continue the process until the sewer system designated for remediation has been completed.

Access to the sewer pipeline for insertion of the power wash system will be gained through the chemical sewer lift stations. The chemical sewer lift stations will be used as sumps to collect the wash water and sediments as they are removed. The power wash system will be inserted and extended into the pipe until the next chemical sewer lift station on the line is encountered. The power wash system would then be withdrawn to flush the sludges from the line and into the lift stations. Each pipeline segment will be flushed once and then sealed to prevent the backwash of the next pipeline section from entering into the washed section.

There may be material plugs, or other obstructions in the lines to stop the progress of the power wash system. If this situation is encountered, the Contractor shall try to loosen the blockage by working the power wash system from both sides of the blockage.

The collected wash water may be combined with water initially vacuumed from the sewer system and handled accordingly. Sediments removed during power washing activities may be combined with the sludges initially removed from the lift stations and handled accordingly.

The Contractor will be responsible for developing an approved Health and Safety Plan (HASP) and a Contingency Plan for release of material prior to commencing removal of material from the chemical waste sewer system. The HASP shall include requirements and procedures for potentially entering the lift stations that are confined spaces and may require Level B PPE.

2.3.7 Sealing the System

When power washing and removal operations have been completed, the system will be sealed to prevent unauthorized access into the lift stations. The sealing will be completed by rewelding the chemical lift stations manhole covers, which will be performed by a certified welder.

2.4 APPLICABLE PERMITS

The Contractor will be required to obtain all necessary permits to conduct/complete removal actions. Potentially applicable permits include, but are not limited to, the following:

- Excavation/utility clearance Permit for Areas A, B, the TNT pipeline, and other areas, as required.
- Erosion and Sedimentation Control Permit.
- Construction Permit.
- New York Department of Labor permit for asbestos abatement.

3. DEVELOPMENT OF REMEDIAL ALTERNATIVES FOR TNT PIPELINE

3.1 SUMMARY OF PRDI FINDINGS

Test pit excavation activities 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 found during the test pit excavation activities were at the approximate locations as shown on available drawings of the original TNT facility layout. According to the drawings and site observations, the pipelines encased within the concrete are vitreous clay pipe and range in diameter from 10 to 18 inches. It is estimated that almost 10,000 linear ft of pipeline exist (see Figures 3-1 and 3-2 for the location of the TNT pipelines).

Based upon information available to date, the following materials are identified for remediation:

- An estimated 100 yd^3 of sediment within the pipeline (based on an average of one-fourth of the pipeline volume containing sediment).
- An estimated 65,000 gallons of water within the pipeline (based on an average of three-quarters of the pipeline volume containing water).
- Possible soil contamination at locations of possible breaks in the pipes and concrete casing (assuming 50 yd^3 for estimating purposes).
- Approximately 10,000 linear ft of pipeline and associated construction materials.

3.1.1 Explosives Contamination

TNT and explosive compounds (including TNT intermediates) were found at varying concentrations throughout the length of TNT pipeline investigated. The concentration of total secondary explosives did not approach the 35% by weight concentration previously reported by SCA for samples analyzed by Hazards Research in 1982. The highest concentration of total secondary explosives detected during the PRDI and other recent investigations was approximately 8% in the sediment sample collected from the North pipeline in TP-7 (Sta. 24+00). The next highest concentration of total secondary explosives, at approximately 2% by weight, was

detected in 1989 by Acres in the sediment sample collected from the pipeline in the test pit near Sta. 14+00 and in sediment collected at Sta. 24+30 during March 1997 resampling by WESTON. The next highest concentration of total secondary explosives detected during the PRDI was just over 0.2% by weight. All remaining detections of total secondary explosives were under 0.1%. Based on the results of these investigations, if high concentrations of explosives contamination exist, the occurrences of these elevated concentrations are in isolated areas.

Testing by the U.S. Army has indicated that soils containing secondary explosives at greater than 10% by weight warrant special precautions during handling to minimize the potential for detonation and propagation. Although reported and verified results of investigations to date indicate that potentially detonable explosives levels were not encountered in the TNT pipeline, isolated samples have shown explosives levels approaching these criteria. This, along with the inability to characterize certain sections of the pipeline, including the lower reaches beyond Sta. 31+50, suggest that a conservative approach (i.e., assuming potentially detonable material are present in the TNT pipeline) is still warranted with uncharacterized sections of the pipeline.

3.1.2 VOC and SVOC Contamination

VOC and SVOC contamination, in addition to explosives compounds, was found in varying concentrations at locations along the length of the TNT pipeline system. The different types and concentrations of contaminants detected indicate that the pipeline has been used in the past for the disposal of non-TNT-related wastes (see PRDI, WESTON, May 1997 for further detail). The detected organic solvents are not breakdown products of the TNT wastes in the pipeline. Access to the TNT pipeline for waste disposal may have been made through previously existing manholes located along the length of the pipeline.

3.1.3 AFP-68-Tie-in to the TNT Pipeline System

A test pit excavation was conducted at Sta. 25+00 in order to assess the physical nature of the tie-in of the AFP-68 chemical waste sewer system with the TNT pipeline. An available drawing (Underground Composite Plan Yard Piping, Drawing No. 317-13-62 prepared by Catalytic Construction Company for Olin Mathieson Chemical Corp., last dated 5 January 1959) indicated

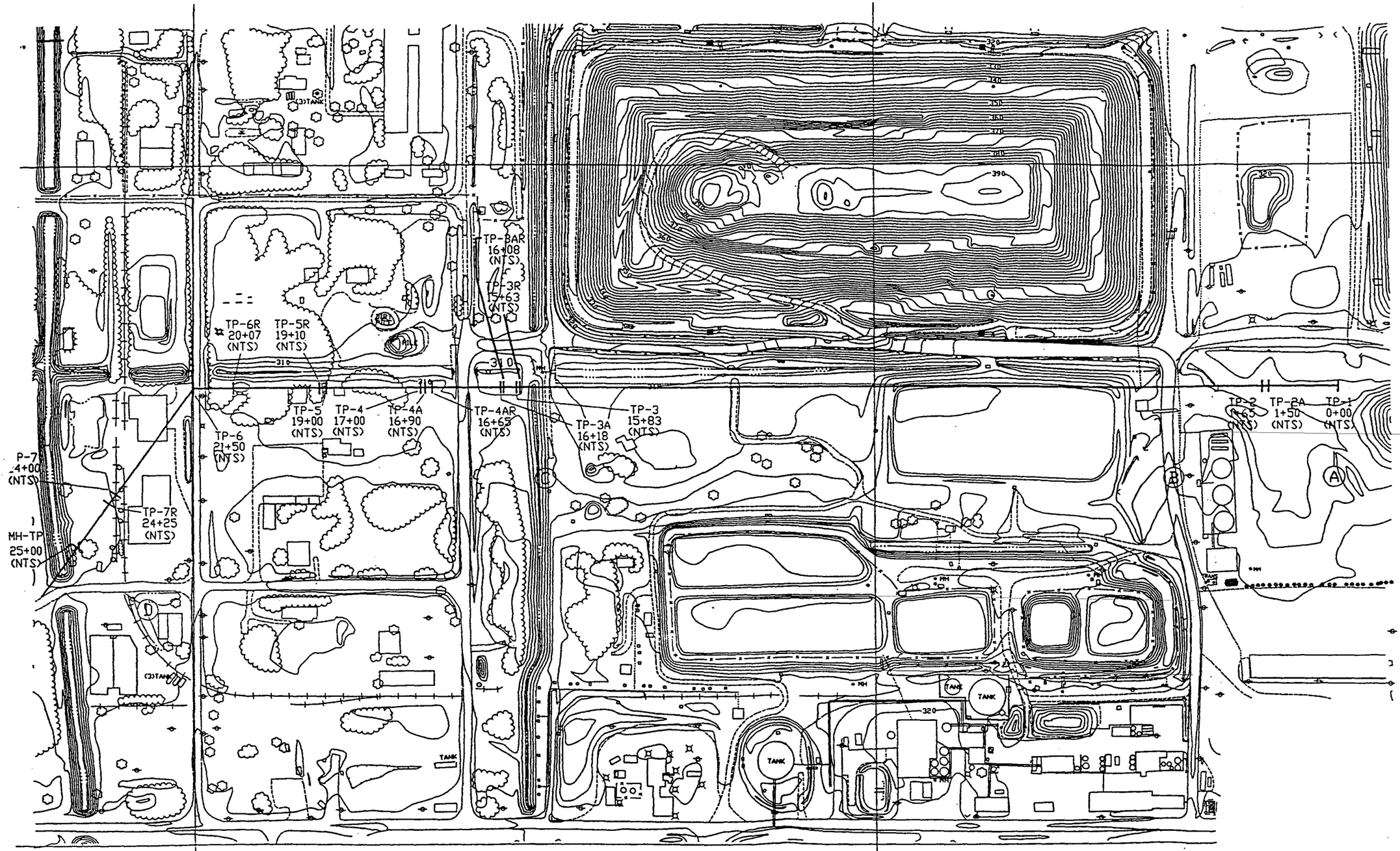


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FIGURE 3-1 TNT PIPELINE AND SAMPLE LOCATIONS

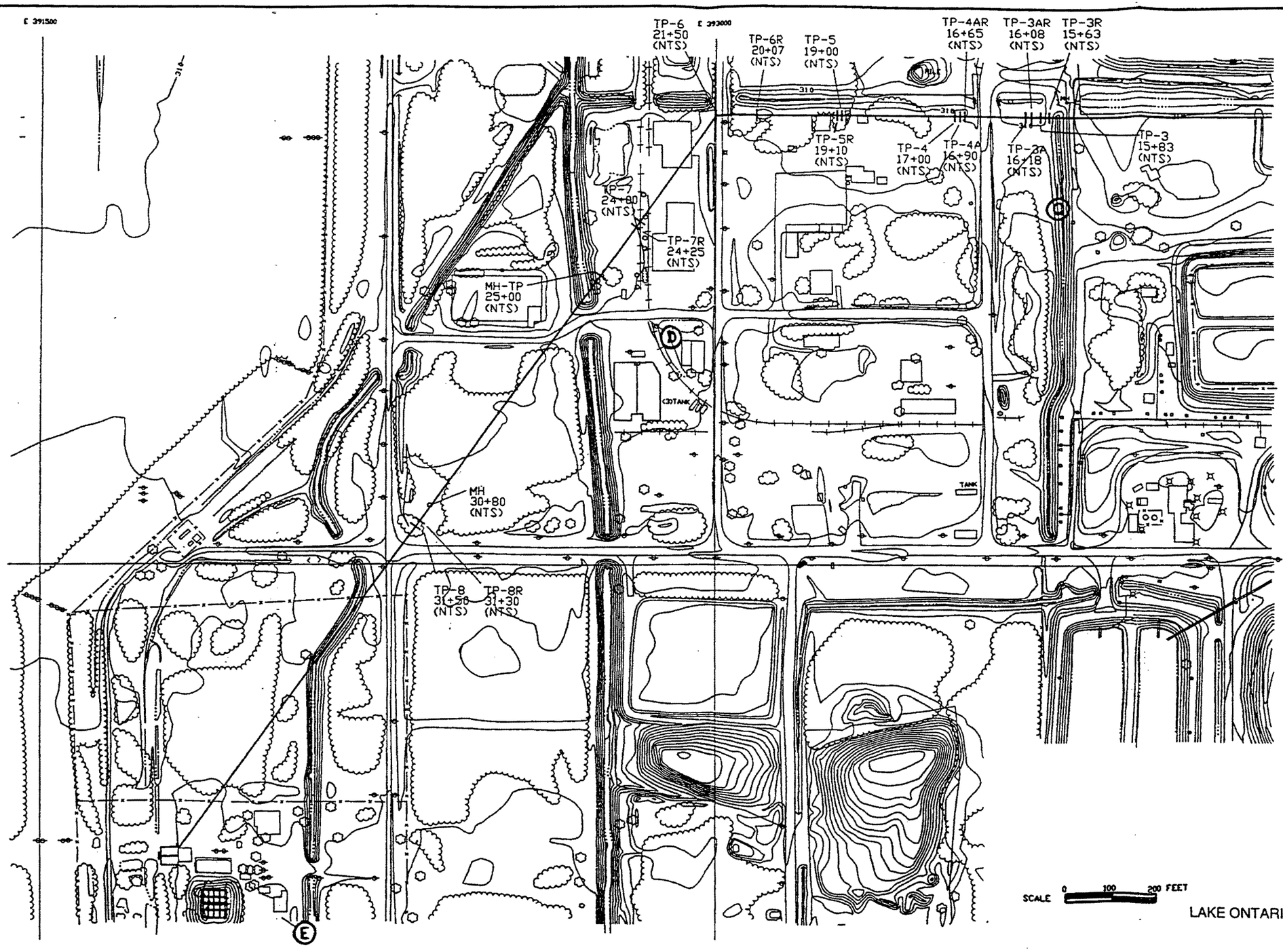

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FIGURE 3-2 TNT PIPELINE AND SAMPLE LOCATIONS

that the tie-in of the two systems was located at the manholes at Sta. 25+00. The level of detail provided in the drawing was not sufficient to identify the actual physical configuration of the tie-in nor the specific source of the waste being discharged from AFP-68. The drawing does indicate that the source of the waste was Area 24 North. Based on the spatial locations of the Area 24 North treatment facilities (i.e., acid neutralization lagoon and oil/water separator) relative to the manholes, it was suspected that the acid neutralization lagoon was the contributing waste source at the tie-in.

A release of liquid with an initial oily phase was encountered while attempting to locate the tie-in in the manhole area during the PRDI conducted by WESTON in October 1996. Subsequent attempts to determine the source of the released liquid resulted in identifying the probable source as the oil/water separator in Area 24 North. Based on observations made during the excavation, the probable point of release of the liquid is believed to be the tie-in of the AFP-68 sewer system with the South TNT pipeline. The North pipeline was well exposed and no tie-in was observed.

Further review of available site drawings (Drawing No. 324-01-01-1, Process Flow Sheet - Chemical Waste Disposal - Sewage, Drainage, and Chemical Waste Disposal prepared by Catalytic Construction Company for Olin Mathieson Chemical Corp., last dated 12 August 1959) indicates that the 45,000-gallon oil/water separator had three outlets. One outlet directed skimmed oil to a waste solvent furnace. A second outlet directed aqueous underflow to a 5,000-gallon neutralizer. The third outlet directed overflow during heavy rains to an existing 18-inch vitreous clay pipe.

This third outlet is believed to be the connection of the AFP-68 sewer system to the TNT pipeline, specifically to the South (18-inch) pipeline. The line directed the wastewater to the wet well of the mixing house at the original TNT wastewater treatment plant located on the current Town of Lewiston property. This connection would explain the occurrence of the similar appearance and types of contaminants, such as PCBs and BTEX, found in the MH-TP (Sta. 25+00) and at locations further downgradient along the South pipeline (i.e., TP-8 South line at Sta. 30+80 and TNT south manhole at Sta. 30+50).

The drawing also indicates that the discharge from the neutralizer was directed to two 30,000-gallon sludge basins, which are believed to be the two cells of the former acid neutralization lagoon. The drawing also indicates that the discharge from the sludge basins was directed to the wet well of the mixing house at the former TNT wastewater treatment plant. It is believed that this discharge to the wet well was directed through the North line of the TNT pipeline system.

Site drawings providing additional detail of the AFP-68 tie-in and use of the TNT pipeline system are currently being pursued.

All of the discharge points from the oil/water separator known and identified during the PRDI are scheduled to be sealed with cement grout by CWM. The oil/water separator and related discharge lines are not part of this interim removal action. Residual soil contamination at Sta. 25+00 from the oil discharge and at potentially other spill or leakage locations along the TNT pipeline identified during removal actions will be remediated in accordance with NYSDEC soil cleanup criteria as part of the interim removal action.

3.1.4 Physical Condition of the TNT Pipeline System

The PRDI found that the TNT pipeline system consists of parallel pipelines separated by approximately 15 ft, as indicated on existing drawings. The pipelines were also found to be enclosed in fairly competent concrete casing in most areas.

It has been reported that the TNT pipeline system located in currently active areas of the CWM's facility has been grouted in several locations as a result of excavations in these areas during construction activities. These reported locations are shown in Figure 2-1. Sections of the pipeline have also been accessed for sampling during the PRDI and other investigations (see Figures 3-1, 3-2, and the PRDI, WESTON, May 1997, for further sampling location detail). These access points in the pipeline were plugged with bentonite after completion of sampling activities. It is not known if the pipeline has been accessed or plugged farther downgradient than the PRDI sampling (i.e., downgradient of Sta. 31+50).

The PRDI and previous investigations have shown that other facilities have been constructed over portions of the TNT pipeline. These include the northern portion of the North Salts Pond, on current CWM property, the concrete foundation of the Area 7 process area, and the refrigeration building, referred to as Area 16, on the former AFP-68 property.

The sections of the pipeline that contain obstructions, from past grouting and bentonite sealing activities, may require an alternate approach to the remediation than the sections that are free of obstructions. An alternative approach may also be applicable for sections of the pipeline that are beneath existing structures. Subsection 3.3 will discuss potential alternatives that may better address these sections of the pipeline.

3.1.5 Conclusions

The following summarizes the conclusions that were drawn from the investigations of the TNT pipeline system performed to date (PRDI, WESTON, May 1997):

- With the exception of the 1982 finding by SCA, TNT has not been found above the established detonable limit of 10% by weight TNT. The lack of detection of high concentrations of TNT indicates the sporadic occurrence of TNT along the pipeline system.
- The presence of potentially detonable pockets of explosives cannot be eliminated because concentrations approaching 10% were found in isolated samples and some sections of the line cannot, at present, be characterized. The presence of liquids throughout the pipeline should also be considered when implementing engineering controls to diminish the potential explosive hazard of the pipeline.
- The estimated volumes of the pipeline contents has been revised from the EE/CA (Acres, March 1995) for sediments from 150 yd^3 to 100 yd^3 and for water from 45,000 gallons to 65,000 gallons. Soil quantity estimates remain unchanged.
- VOC and SVOC contamination, apparently unrelated to the original TNT manufacturing operation, has been detected in varying concentrations along the TNT pipeline system, indicating potential use of the system for other waste disposal. VOC and SVOC contamination primarily exists in the South line below Sta. 25+00.
- Field observations and site drawings indicate that the oil/water separator from the AFP-68 chemical waste sewer system tied into the South TNT pipeline at Sta. 25+00 and associated contamination is suspected to be present throughout the remaining downgradient portion of the South pipeline.
- The presence of specific contaminants such as PCBs in the South pipeline will require special handling of this pipeline and its contents during remediation.

3.2 APPLICABLE REGULATIONS

The following regulations and guidances are applicable or relevant and appropriate requirements (ARARs) for the remediation of the TNT pipeline:

Soils/Sediments

- 40 CFR 261—Identification and Listing of Hazardous Wastes
- 40 CFR 268—Land Disposal Restrictions
- 40 CFR 761—Toxic Substances Control Act - PCBs
- 6NYCRR Part 371—Identification and Listing of Hazardous Wastes
- 6NYCRR Part 376—Land Disposal Restrictions
- NYSDEC, Division of Hazardous Waste Remediation, TAGM HWR-94-4046, "Determination of Soil Cleanup Objectives and Cleanup Levels"
- NYSDEC, Division of Hazardous Substances Regulations, TAGM HSR-92-3028, "Contained-In Criteria for Environmental Media"

Liquids

- 40 CFR 761—Toxic Substance Control Act - PCBs
- 6NYCRR Part 700-705—Water Quality Regulations
- NYS TOGS 1.1.1—Ambient Water Quality Standards and Guidance Values

3.3 POTENTIAL REMEDIAL ALTERNATIVES

The proposed approach to the remediation of the TNT waste pipelines as presented in the EE/CA included:

- Removal and open flaming/detonation of any crystalline TNT solids at a nearby secure site.
- Removal and biotreatment of explosives-contaminated sediment and solids.
- Removal and disposal of all remaining excavated materials characterized as a hazardous waste at a permitted RCRA landfill.
- Removal and disposal of all nonhazardous materials at a 6NYCRR Part 360 permitted landfill.

The results of the PRDI indicated a number of important findings that were summarized in Subsection 3.1. Based on the results of the PRDI, a reevaluation of the potential approaches to the removal action for the TNT pipeline is presented in the following subsections. First, proposed removal options for the contaminant sources are discussed and evaluated. This is followed by the Contractor's responsibility for pipeline sediments, and then a discussion of disposal and pretreatment options. Finally, the approach to handling and treatment/disposal of crystalline material, if encountered, is discussed.

As discussed in Section 2, the additional openings made during the PRDI were also plugged. Therefore, except in known areas of prior construction or sampling activity, the north and south TNT pipelines are anticipated to be intact.

3.3.1 Removal Options

The results of the PRDI indicated through visual inspection of the TNT pipeline and sampling and analysis of soils surrounding the pipeline, that both the north and south lines were intact and no evidence of breakage or leakage was observed except for the most upgradient sections of the line where construction activities by SCA and CWM had previously intercepted the pipeline. These breaks had been plugged and documented by SCA and CWM (see Figure 2-1). Furthermore, TNT was not found during the PRDI above the potential detonable limit of 10%, and in most of the sampling locations was less than 1%. This is in contrast to the assumption made in the EE/CA that all of the TNT pipeline sediments contained more than 10% explosives. In addition, it was reported by CWM during a recent encounter (1990) with excavated TNT pipelines and soils, that these materials were determined to be nonexplosive and nonhazardous, and were disposed of without treatment at a 6NYCRR Part 360-permitted facility.

The generally intact condition of the TNT pipeline, the lower than previously assumed explosive concentrations in the pipeline contents, and the nonhazardous characteristics of the actual pipeline and concrete encasement suggest options other than complete removal may be applicable to the LOOW site.

The results of the PRDI did confirm that the TNT pipeline, both north and south lines, contain water and sediment that are contaminated with varying concentrations of explosives, VOCs, SVOCs, and, in the lower section of the south line, PCBs. These materials constitute a potential source of contamination to the surrounding soils and groundwater if the pipeline is breached. Removal of this source is an objective of the Interim Removal Action, but may be accomplished by alternative methods other than those proposed in the EE/CA, based on the field and laboratory data obtained from the PRDI.

Alternatives to complete pipeline removal have been used at other sites. The approach to remediation of TNT pipelines at the former Alabama Army Ammunition Plant (ALAAP) in Childersburg, AL, included flushing out the sediment contained within the pipeline with a high-pressure washer and closing the pipeline in-place. A TNT sewer line at the West Virginia Ordnance Works was remediated by flashing the exposed pipeline and covering the pipeline 2 ft below the surface. Closure in-place of the TNT pipeline at LOOW could be a viable option as long as the contents of the pipeline could be effectively removed, thereby removing the potential source of contamination to surrounding soils and groundwater. In addition, closure in-place would also require plugging the pipeline in order to prevent it from acting as a conduit for potential contaminants that are not associated with the TNT pipeline, and also to limit potential future head buildup in the pipeline due to infiltration. This could be accomplished by effectively grouting the ends of sections, at the access points for power washing, of the remediated (power washed) pipeline.

Power washing would not be feasible in sections of the pipeline that have been broken and plugged at multiple locations in proximity to each other due to past construction/excavation or recent sampling activities. Sections in which breaks and plugs occur in proximity that would make power washing difficult and costly include Section A-B, portions of Section B-C, and Section C-D (up to the bend at Station 21+00 that are not located adjacent to or under existing structures and utilities). Within these designated sections, the interim removal action would consist of complete removal of the pipeline and its contents as proposed in the EE/CA. Localized soil contamination detected during the PRDI at broken-up manhole locations would also be removed. Undocumented breaks, plugs, tie-ins, and obstructions in sections of the pipeline that would be

power washed would be identified remotely prior to power washing using current pipeline video technology that is used to inspect municipal sewer systems.

The closure in-place option, where appropriate, would therefore first consist of exposure of the pipeline at an up- and downgradient location. Clearing and grubbing, erosion and sediment control measures, and stormwater management will be performed as discussed in Section 2 for Areas A and B. A temporary sump will be constructed at each of these access points prior to opening the pipeline. This sump will be temporarily lined with plastic and any spills properly remediated by the Contractor. The power washing operation would begin at the most upgradient point of the pipeline and the downgradient access point for each section. The distance between the upgradient and downgradient access locations would depend on existing plugs, identified tie-ins, and the capability of the power washing equipment. To address the issue of the closed pipeline acting as a future conduit to potential site contamination, a maximum distance of approximately 250 ft should be required between access points that will be grouted after power washing. A seepage collar composed of bentonite grout can also be constructed at these plug locations to preclude transport of contaminants not associated with the TNT pipeline along the outer surface of the pipeline that may affect site-wide contaminant distribution.

Once the pipeline has been accessed, the liquid contents, if any, will be pumped out into temporary storage tanks for sampling and analysis. These liquids will be treated and disposed of in accordance with applicable regulations based on the results of the characterization analysis. Following liquid removal, an initial video inspection of the TNT pipeline will be performed between the up- and downgradient access points to identify any breaks, plugs, blockages, tie-ins, and, where possible, crystalline material. In the event that the pipeline is completely filled with sediment such that video inspection cannot be conducted, the pipeline will be power washed and a video inspection will occur after power washing operations. If any breaks or tie-in(s) that could provide a potential pathway for release of fluids during power washing operations are encountered, they will be accessed and either sealed or used as a new pipeline access point and sump area. In areas where pipeline damage has been identified, the pipe will be exposed and the underlying soils sampled. If a plug is encountered, the pipeline will be accessed at this point and a

new access point and sump established. If crystalline material is observed, the pipeline will also be accessed and the crystalline material removed under direction from the explosives expert.

Removal of the pipeline sediments will be conducted using a truck-mounted system with power washing and vacuum equipment. A hose with a high-pressure power washer nozzle will be inserted into the downstream end of the exposed pipeline interval at the temporary sump. (Power washing the lines from the upstream end toward the downstream end is generally to be avoided because this can lead to the formation of material plugs in the lines). The power washer nozzle will be extended into the pipeline interval then withdrawn to flush loosened materials from the line. This method will be followed for each interval of pipeline to be power washed.

The vacuum hose is placed at the downgradient access point and water is pumped from the sump as it is generated from the power washing operation. The vacuum pump should have a minimum pumping capacity of 125 gallons per minute. The vacuum hose will pump sediment and water from the pipeline into a tank truck or a portable tank mounted on a truck. The water and solids will then be pumped into an on-site tank to allow the solids to settle. Following this, the water will be decanted, sampled, and analyzed to determine the proper disposal methods as discussed in the following subsection. The sediments will be handled, containerized, and transported as directed by USACE.

Power washing equipment can process 400 to 500 ft of pipe between access points. The Contractor should be allowed to determine the most effective methods and distances between access points to effectively remove the contents of the pipelines. The Contractor will be required, however, to create an effective plug with cement grout at a minimum interval of 250 ft to address potential site contaminant pathway issues not associated with the TNT pipeline as discussed previously.

A daily production rate of 250 ft of pipeline can be expected if the level of sediment is less than a third of the pipe diameter, which is the case at most of the sampling points observed during the PRDI. The power washing equipment uses approximately 2,500 gallons of water per 250 ft of pipeline. The major system requirements are a supply of water and a location for storing the water and solids after power washing.

The option of removing the TNT pipeline contents by power washing and in-place closure of the encased pipeline is evaluated, using the criteria from the EE/CA, in tabular form in Table 3-1. The evaluation of this option indicates that it can be as effective as complete removal of pipeline, because the source of contaminants is effectively removed and properly disposed of. The in-place closure option is also technically feasible because this method has been used for TNT waste lines at the ALAAP site. In-place closure also provides cost savings, due to the significantly lower volume of material to be disposed, over the complete removal option at a comparable level of overall effectiveness in addressing the objective of the interim removal action.

Due to the varying conditions along the pipeline that may not be favorable to power washing, such as frequent breaks/plugs, complete removal may be more cost effective within these sections of the pipeline. Recommendations for which option is more favorable due to existing conditions along designated sections of the pipeline are presented in Section 4.

These recommendations were reviewed by CENAB at the 30% Design and were approved with minor changes. The recommendations presented in Section 4 reflect the comments received at the 30% Design phase.

3.3.2 Proposed Bioremediation of Sediments/Pretreatment and Disposal Options for Pipeline Contents

The Contractor is responsible for the containerization and transport of all sediments removed from the pipeline to a designated treatment/disposal facility. The evaluation and final treatment/disposal of the pipeline sediments is being performed through a separate research and development contract under the direction of USACE Baltimore District.

Because of the high moisture content of the sediments, on-site moisture stabilization prior to transportation to the USACE Baltimore District-designated treatment/disposal site will likely be required as the minimum pretreatment. USACE Baltimore District will provide pretreatment requirements for the sediments prior to off-site transport at the 90% Design phase.

Table 3-1

Evaluation of Alternatives for TNT Pipeline

Evaluation Criteria	Closure In-Place Alternative	Complete Removal Alternative
Effectiveness		
Protectiveness		
1. Protective of public health and community	Contaminant source (contents of pipeline) removed and transported to secure permitted facility. Although no current receptors, removal of source material protects potential future receptors. Plugging/grouting ends of flushed sections will address potential of becoming conduit to site contamination not attributable to the TNT pipeline.	Contaminant source and conduit for potential future contamination removed and therefore risk to potential future receptors eliminated.
2. Protective of workers during implementation	Contractor will be required to develop for approval a HASP outlining all health and safety protocols. Results of PRDI indicate no potentially detonable material encountered, although crystalline material may exist. Contractor to hand remove crystalline material using explosives expert, if encountered. Remote video inspection will be performed to investigate if detonable material exists in pipeline. Less-impact type of activities under this alternative.	Same Contractor requirements and protocols as in closure in-place alternative. Contractor's method of pipeline removal will require approval by explosives expert. Greater amount of impact-type activity under this alternative. Blast shielding will be required for pipe removal/crushing operation.
3. Protective of the environment	Contaminant source removed and therefore source of potential environmental impact. Flushing will effectively remove contents of pipeline. Residuals potentially remaining on the pipeline and concrete encasement will be at very low concentrations. Results of analysis by CWM indicated pipe and concrete to be nonhazardous. Due to low concentration and low or equal pressure in pipe after plugging mass transfer or other mechanism to groundwater not likely.	Complete removal of source and pipeline materials eliminates potential further impact to environment.
4. Complies with ARARs	Treatment/disposal of pipe contents will be in accordance with applicable regulations. Impacted soils removed to cleanup standards. Alternative complies with ARARs.	Alternative complies with ARARs.

Table 3-1

Evaluation of Alternatives for TNT Pipeline (Continued)

Evaluation Criteria	Closure In-Place Alternative	Complete Removal Alternative
Implementability		
Technical Feasibility		
1. Construction & operational considerations	The alternative could be accomplished using conventional construction techniques modified to address potentially detonable materials for both excavation and power washing activities. Flushing is not cost-effective and technically feasible in sections of the pipeline that have been broken and plugged from construction and sampling activities.	Complete removal could also be completed using standard excavation techniques modified to address the potential for detonable materials. The separation of sediments from the pipeline materials by hand as suggested in the EE/CA would be very time consuming. Removal of the pipeline and separation by washing in decontamination area would also be less cost-effective than flushing the line. Spillage would also be more likely.
2. Demonstrated performance	Both excavation and power washing techniques have been demonstrated successfully at other remediation projects.	Excavation techniques using a shielded excavator and crusher has been used on other TNT pipeline remediation projects. Separation of sediments from the pipeline in-place by hand or after removal as an effective method has not been documented. This needs to be better defined. Removal and flushing of pipe used at other sites.
3. Adaptable to environmental conditions	Implementation during the winter months may present difficulty due to using water for power washing. Freezing of the water would present various problems.	Cold weather and heavy rains can delay excavation operations.

Table 3-1

Evaluation of Alternatives for TNT Pipeline (Continued)

Evaluation Criteria	Closure In-Place Alternative	Complete Removal Alternative
Implementability (continued)		
Availability		
1. Equipment, personnel, and services	The equipment and personnel are available for implementation of this alternative. Shielding specific to equipment will need to be constructed and installed.	The equipment and personnel are available for implementation of this alternative. Shielding specific to equipment will need to be constructed and installed.
2. Outside laboratory testing capacity	Outside laboratory capacity exists for confirmation sampling required for the alternative.	Outside laboratory capacity exists for confirmation sampling required for the alternative.
3. Off-site treatment and disposal capacity	Disposal and treatment capacity exists for the wastes to be encountered, although choices may be limited due to possible PCB and high volatile organic contamination in the lower south line.	Disposal and treatment capacity exists for the wastes to be encountered, although choices may be limited due to possible PCB and high volatile organic contamination in the lower south line.
Administrative Feasibility		
1. Likelihood of public acceptance	Removal of the contaminant source should address public concern.	Complete removal of the pipeline and contents will address public concern.
2. Permits required	Permits for construction, E&S, and stormwater discharge will be obtained prior to mobilization.	Permits for construction, E&S, and stormwater discharge will be obtained prior to mobilization.
Cost		
	Closure in-place would decrease the total cost for disposal and excavation compared to complete removal. The lower cost of disposal would offset the cost of flushing and the slightly higher cost of aqueous treatment since the power washing activity will generate additional water. An estimated 200 to 250 ft of pipeline could be remediated in a day compared to approximately 150 ft/day for the complete removal alternative.	The cost of complete removal will be higher due to greater amount of excavation and disposal cost for the pipeline and concrete. An estimated 125 to 150 ft of pipeline could be remediated in a day.

3 Pretreatment and Disposal Options for Soils

Pretreatment of contaminated soil prior to disposal will depend on the regulatory requirements and classification of these materials. Collected and containerized stockpiled soils will be sampled and analyzed to determine waste classification. Analysis will include RCRA waste characteristics to determine whether the soil is hazardous or nonhazardous in accordance with 40 CFR 261 and 6NYCRR Part 371, and other waste characterization as required by the accepting facility(ies). Soils that are classified as RCRA hazardous, as identified in 40 CFR 261 and 6NYCRR Part 371, will be disposed of at a competitively bid RCRA permitted disposal facility. Pretreatment of the soil if classified as RCRA hazardous may be required to meet the land disposal restrictions. The Contractor will be required to meet these requirements and will be allowed to select the most cost-effective pretreatment options consistent with the facility's acceptance criteria. Alternatively, the materials could be shipped as RCRA hazardous waste to the facility for pretreatment and disposal. Because of the anticipated small quantities of material and the varying characteristics of the materials, it is likely the Contractor will have the disposal facility perform any of the required treatment at its facility prior to disposal. Material that is classified as non-RCRA hazardous or that is rendered non-RCRA hazardous by on-site treatment will be disposed of at a 6NYCRR Part 360 permitted landfill.

3.3.4 Handling and Treatment of Crystalline Material

Any crystalline material encountered in the TNT pipeline will be removed under the supervision of the explosives expert. As recommended by the EE/CA, crystalline material will be placed in a nonsparking container and transported to a nearby secure site designated by USACE Baltimore for treatment by open flaming. Preparation of an Explosive Safety Plan that includes the handling and treatment of crystalline material will be required in the specifications. The Explosive Safety Plan shall be prepared by the explosives expert. Requirements for the explosive expert will be stated in the contract specifications (Section 01110: Safety, Health, and Emergency Response (HTRW/UST)). The location of the secure site needs to be identified.

3.4 TNT PIPELINE REMEDIATION

Based on the evaluation of potential removal alternatives for the TNT pipeline discussed in Subsection 3.3, there are two viable alternatives depending on the conditions encountered along the pipeline. These alternatives include power washing and closure in-place and complete removal of the pipeline. The primary components of the alternatives are presented in this section. Based on comments from USACE Baltimore District on the Preliminary DAR (30% Design), the two alternatives presented were approved and technical specifications have been prepared for both alternatives. Technical requirements for the TNT pipeline remediation that are similar to those presented in Section 2 for Areas A and B include the following:

- Site Preparation
- Erosion and Sedimentation Control
- Groundwater and Stormwater Management
- Controlled Fill

The technical components and requirements that are specific to the TNT pipeline remediation that will be addressed in the specifications are discussed in this section.

3.4.1 Removal of the Pipeline

This alternative includes complete removal of the TNT pipeline. This alternative was the recommended removal alternative presented by the EE/CA. The major components of this alternative are presented below (see Figures 3-3 and 3-4):

- Site preparation.
- Excavation and removal of the pipeline and associated contaminated materials.
- Removal of the liquids from the pipeline and disposal.
- Removal of the sediments contained within the pipeline and disposal.
- Confirmation soil sampling.
- Backfilling of excavated areas.

These components are described in greater detail in the following subsections.

Figure 3-3

Alternative 1 - Complete Removal of the TNT Pipeline

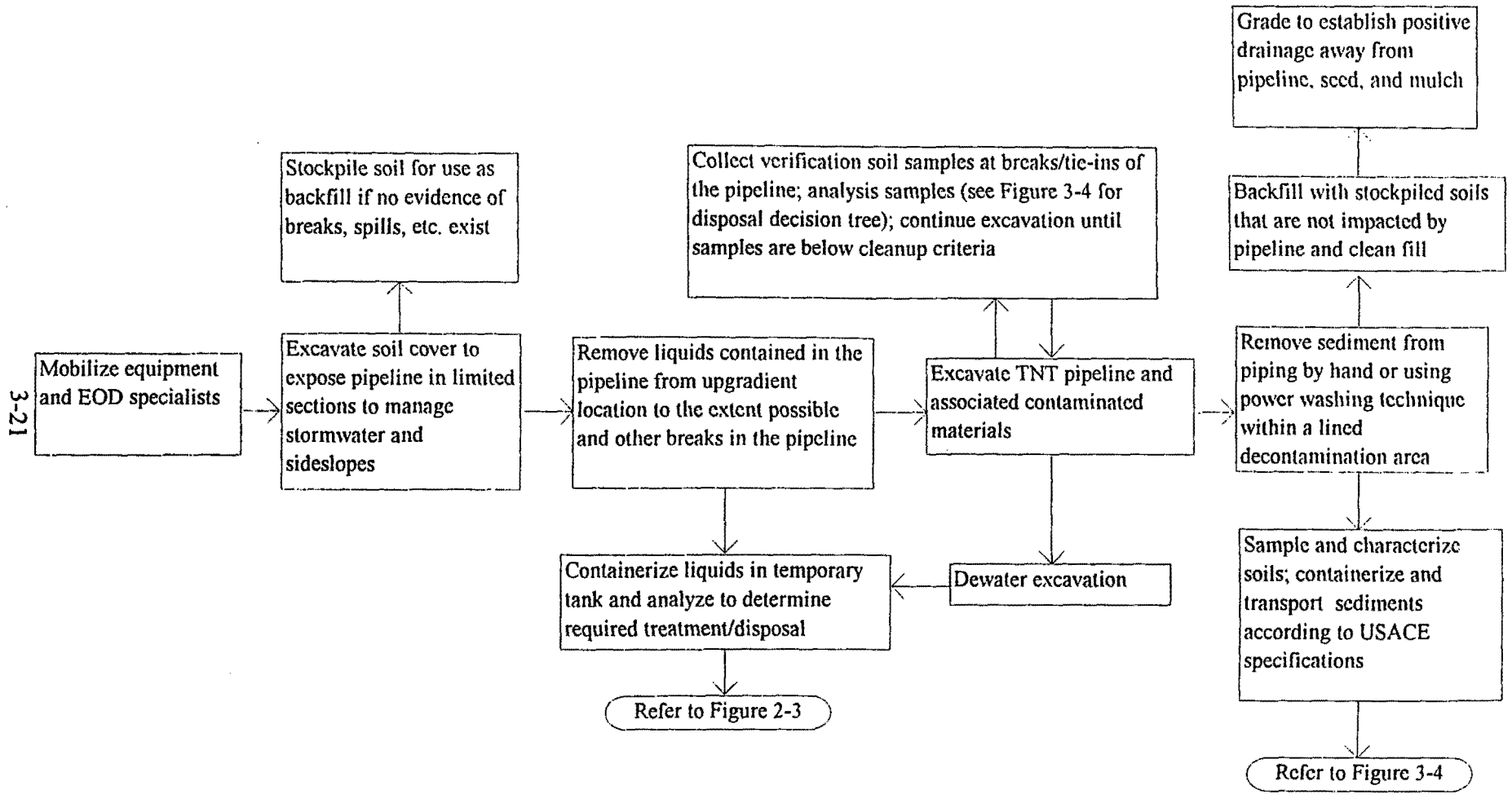
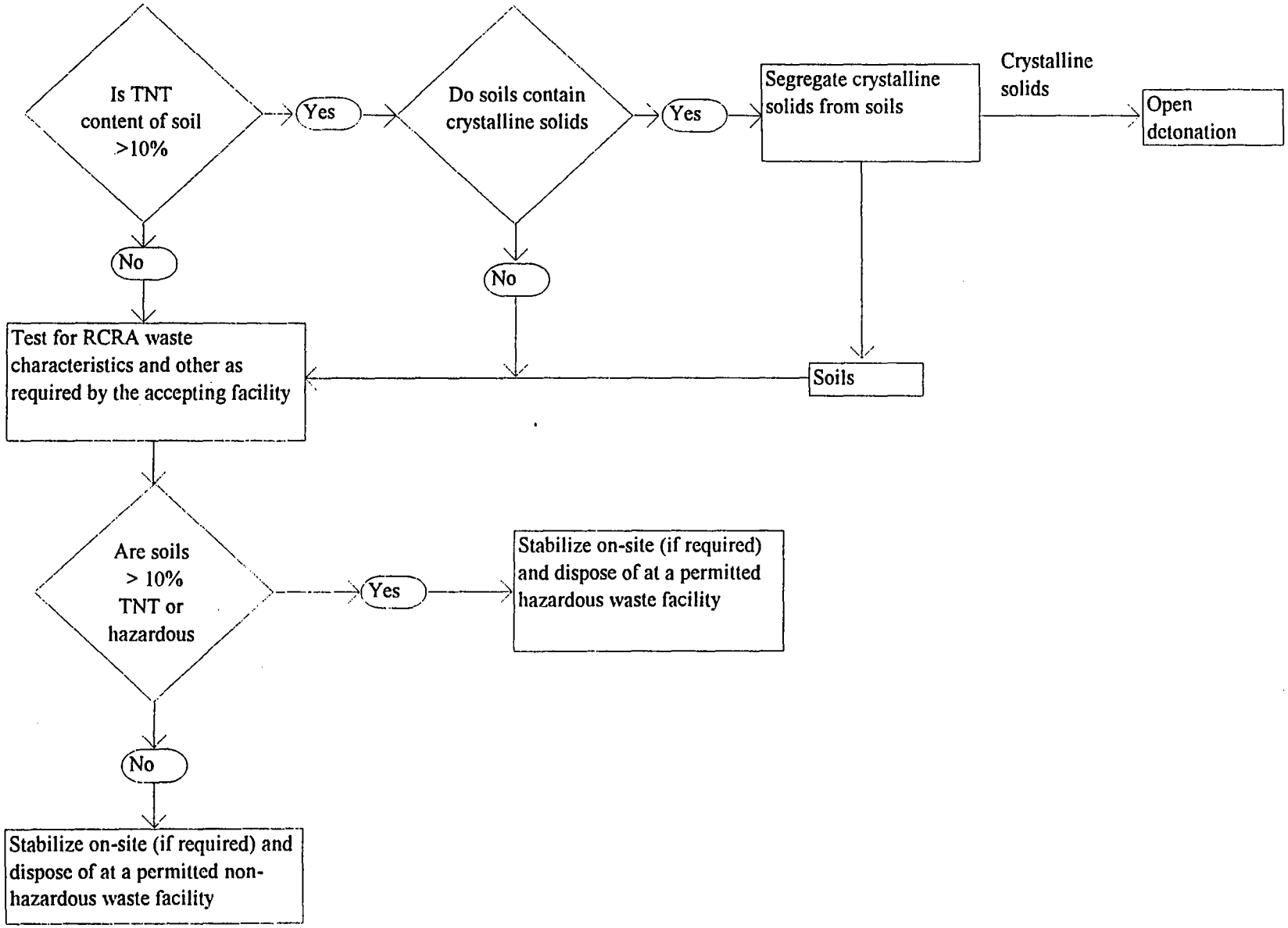


Figure 3-4

Disposal Alternatives for Soils from the TNT Pipeline



3.4.1.1 Excavation of the Pipeline

Excavation will begin at the most upgradient point of the TNT sewer pipeline. Excavation of the soils overlying the TNT pipeline will be conducted in intervals determined by the Contractor to make the excavation manageable and reduce the amount of storm event infiltration. Excavation will proceed until conditions exists to remove the TNT pipeline section safely.

The excavated soils overlying the pipeline will be staged for either later disposal or backfilling. If disposal is required, the transporting vehicles will be loaded and operated in such a manner so as to prevent any spillage or loss of material (refer to contract specifications, Section 02226: Excavation, Staging, and Containerization of Contaminated Soils and Drums - Areas A and B).

All excavation activities will be planned and executed to minimize the disturbance of surrounding structures and pavements. Excavation of side slopes are the sole responsibility of the excavation Contractor. Remote sampling is the preferred technique for confirmation soil sampling of excavations greater than 4 ft to avoid additional excavation required for sloping. However, if a need should arise for personnel to enter the excavation area, the working area slopes should be cut to inclinations approved by OSHA requirements of 29 CFR Part 1926 and EM 385-1-1, 3 September 1996, Section 25 to provide for safe working conditions. Cut slope inclinations in these instances must be designed by a qualified civil or geotechnical engineer. Sheeting and shoring of excavation sidewalls, if needed to protect construction personnel or existing nearby structures (e.g., utilities or roadways), should be designed and constructed and also must conform to OSHA and EM 385-1-1 (September 1996) requirements. The stability of excavation side slopes and temporary retention systems, as well as the safety of project personnel working within the excavations, will be the sole responsibility of the Contractor.

During excavation operations, the Contractor must enforce all health and safety regulations applicable to the construction including, but not limited to, dust control, hearing and vision protection, protective headwear, and appropriate level of personal protective equipment (PPE). Requirements for health and safety will be presented in the Contract Specifications (Section 01110: Safety, Health, and Emergency Response (HTRW/UST)).

3.4.1.2 Soil Stockpiling

Soil stockpiling and staging locations will be constructed prior to construction activities (refer to contract specifications, Section 02228: Flushing and Closure In-Place of TNT Pipeline and Section 02229: Excavation and Complete Removal of TNT Pipelines). The Contractor will designate the number of staging areas to be constructed for soils awaiting disposal and for clean soils that will be used as backfill. Clean and potentially contaminated soils will be stockpiled in separate staging areas.

Potentially contaminated soil stockpile areas will be generally located in the vicinity of the excavation area. Potentially or known contaminated soil stockpiles will be placed on a bermed asphalt pad that is underlain by a geomembrane. These soil stockpiles will be covered with an appropriate temporary liner to shed rainfall until they are transported off-site. A sump or low point will be incorporated into the containment procedure as a means to collect liquids for treatment and discharge (see Subsection 2.1.7).

The contaminated soil stockpile area will be constructed in such a manner to contain all liquids in contact with the contaminated soil and to prevent migration of contaminated soil. Migration of any type of contaminants is not permitted. It will be the responsibility of the Contractor to ensure no migration from the contaminated stockpile area occurs. Roll-off storage bins may be used, however, they must be staged in a bermed area to contain any potential spills or contact water and covered with an impervious liner to minimize generation of contact waters.

Locations will be designated to store imported clean soil fill for backfilling, as well as topsoil, to restore the area to final grades. These materials may be placed on the ground surface. Strict erosion and sediment controls must be installed around these stockpiles. Silt fence and gravel fillers will be used for erosion control for the clean soil stockpiles. Stormwater diversions to direct stormwater away from the stockpiles will also be required.

The Contractor must perform confirmation sampling within the contaminated soil stockpile area following removal of the soil to provide evidence that there is no migration of contaminants from this soil storage area. If any contamination is detected outside the limits of the stockpile, the

Contractor will remediate the contamination to cleanup criteria at no additional cost to the Government. Drawings of the TNT Pipeline Erosion and Sedimentation Controls will show acceptable locations of these stockpile areas. The Contractor must provide a drawing showing designated stockpile areas prior to mobilization.

3.4.1.3 Sediment Storage

The USACE Baltimore District will provide the requirements for sediment containerization and transport off-site to the designated treatment/disposal site. The Contractor shall remove and segregate sediment from the sections of the pipeline that will be completely removed in a manner that allows for the proper stockpiling and containerization of the sediments. Staging areas for pipeline sediments shall be bermed and lined to allow for collection of spills and contact water.

Sediments removed from the pipeline by power washing will be initially in the form of a slurry. The slurry shall be contained and stored to allow the sediment to settle out and the liquids to be decanted and transported for treatment/disposal. Moisture content requirements for the sediment prior to transport off-site will be provided by USACE Baltimore District.

3.4.1.4 Removal of Pipeline Liquids

The uncovered interval of the pipeline will be accessed at an upgradient location if a pressure head due to the pipeline liquids is anticipated. The pipeline can be accessed at a downgradient location if an excessive pressure head does not exist. Excessive pressure was observed in the pipeline below Sta. 25+00. Existing manholes, where present, can be utilized to relieve the pressure head prior to accessing the pipeline. The liquids contained in the pipeline will be removed from the accessed location to the extent possible and transferred into a temporary storage vessel (i.e., tanker truck or temporary tank). The containerized liquids will be sampled and analyzed to determine specific treatment/disposal requirements. The liquids will be stored until the results of the analysis are available.

Upon characterization of the liquids and determination of treatment/disposal requirements, the stored liquids will be transported by a licensed waste hauler to a competitively bid permitted

treatment/disposal facility. Transportation and disposal requirements for liquids are provided in the contract specifications (Section 02120: Transportation and Disposal of Hazardous Materials).

3.4.1.5 Removal and Disposal of TNT Pipeline

After the removal of the liquids contained in the pipeline has been completed, the pipeline, including the surrounding concrete, will be removed and staged. The concrete and sediments contained in the pipeline will be segregated by manually removing the sediments. Due to the potential of spills and the extensive time required for manual removal of sediments, the Contractor will be allowed to propose alternate methods such as construction of a lined staging/decon area for removing sediments by power washing and collection of sediments in a lined sump. The pipeline is anticipated to be nonhazardous after removal of the pipeline sediments. The concrete will be staged and transported to a 6NYCRR Part 360 permitted landfill for disposal. The Contractor will containerize and transport all pipeline sediments to a treatment/disposal site designated by USACE Baltimore District.

3.4.1.6 Confirmation Soil Sampling

Soil confirmation samples shall be conducted along sections of the TNT pipeline that have been removed or power washed based on visual evidence of staining spills and/or evidence of past leakage into the surrounding soils. Soil field screening confirmation samples shall be analyzed using colorometric field test kits for TNT that can determine concentrations within a range of 10 to 50 parts per million (ppm) and greater using a spectrophotometer. At a minimum, confirmation samples shall be taken at each end of each removed/or flushed section from both the north line and south line (two samples from each end of each pipeline segment). In addition, confirmation samples shall be collected at 250-ft intervals for sections less than 500-ft and at 500-ft intervals for sections greater than 500 ft for sections of the north and south pipeline completely removed. The Contracting Officer may direct the Contractor to collect and screen additional soil samples based on evidence of spills or past leakage.

The field screening confirmation samples will be first used to determine if the cleanup criteria, as listed in Table 3-2 are exceeded at the suspect or designated sample location. If the criteria is

Table 3-2

TNT Pipeline Constituents of Concern and Cleanup Criteria

Constituent	Maximum Concentration (mg/kg)	NYSDEC* Recommended Soil Cleanup Objective (mg/kg)
Explosives		
2,6-Dinitrotoluene	ND	1.0
Nitrobenzene	ND	.2
Total Explosives	--	40
Additional Contaminants After Location 25+00		
Volatile Organics		
Benzene	770 (s)	.06
Chloroform	35(s)	.3
1.2-Dichloroethene	35(s)	.3
Ethylbenzene	3,600 (s)	5.5
Methylene Chloride	180 (s)	.1
4-Methyl-2-pentanone	420 (s)	1.0
1,1,2,2-Tetrachloroethane	240 (s)	.6
Tetrachloroethene	330 (s)	1.4
Toluene	3,700 (s)	1.5
Trichloroethene	140 (s)	.7
Vinyl Chloride	10 (s)	.2
Xylenes	14,000 (s)	1.2
Semivolatiles Organics		
Acenaphthene	120 (s)	50
Anthracene	140 (s)	50
Benzo(a)anthracene	44 (s)	.224
Benzo(b)fluoranthene	2.8 (s)	1.1
Benzo(k)fluoranthene	2.7 (s)	1.1
Benzo(a)pyrene	2.8 (s)	.061
bis(2-Ethylhezyl)phthalate	390 (s)	50
Butylbenzylphthalate	670 (s)	50
Chrysene	110 (s)	.4

Table 3-2

TNT Pipeline Constituents of Concern and Cleanup Criteria (Continued)

Constituent	Maximum Concentration (mg/kg)	NYSDEC* Recommended Soil Cleanup Objective (mg/kg)
Dibenzo(a,h)anthracene	.97 (s)	.014
Di-n-Butylphthalate	14 (s)	8.1
Fluoranthene	97 (s)	50
Hexachlorobenzene	1,800 (s)	.41
2-Methylnaphthalene	2,600 (s)	36.4
Naphthalene	760 (s)	13
Phenanthrene	1,300 (s)	50
Pyrene	250 (s)	50
Xylenes	14,000 (s)	1.2

* NYSDEC, Division of Hazardous Waste Remediation, TAGM HWR-94-4046, "Determination of Soil Cleanup Objectives and Cleanup Levels."

ND - None detected.

(s) Contaminant detected in pipeline sediments. All soil samples collected were below regulatory limits.

exceeded, the soil is to be undercut and removed for off-site disposal. If the cleanup criteria are exceeded, the Contracting Officer will direct the Contractor to collect and analyze additional confirmation samples to better delineate the extent of contamination or direct the contractor to remove a 6- to 12-inch lift of soil with a 5- to 10-ft radius of the sample or as directed by the Contracting Officer. Following excavation of soils, determined by field screening to exceed the cleanup criteria for total explosives, field screening confirmation samples will be collected at a minimum of 1 per 75-ft^2 area to confirm that the cleanup criteria has been met. If the concentrations are less than the specified contaminant cleanup criteria, no further excavation is required.

Laboratory QA verification samples will be collected and analyzed on a minimum of 20% of the field screening confirmation samples to verify field test results. The TNT pipeline QA verification samples will be analyzed for explosive-related compounds.

Based on VOC and semivolatile organic compound (SVOC) analysis of soils underlying the TNT pipeline during the PRDI, cleanup criteria was not exceeded in any of the soil samples. However, the analysis of the sediment within the pipeline indicated that elevated levels of VOCs and SVOCs are present in sections of the TNT pipeline. At locations where spills or leakage from the pipeline is observed, confirmation and verification sampling and analysis for VOCs and SVOCs will be performed. In sections of the pipeline (southline at stations greater than 25+00) that are suspected of containing PCBs, the confirmation and verification samples shall also include pesticide/PCB analysis.

3.4.1.7 Disposal of Materials

The Contractor is responsible for containerization and transport of the pipeline sediments and contaminated soils (soils that exceed cleanup criteria and cannot be backfilled) to a designated treatment/disposal facility as directed by USACE Baltimore District. The Contractor is responsible for the disposal of the concrete and pipeline from those sections that are designated to be removed. The Contractor is also responsible for treatment/disposal of waters collected from the pipelines and excavations.

Liquid Disposal

All liquids encountered during remediation activities that have come in contact with known or potentially contaminated materials and liquids generated during flushing operations, and water ponded as a result of a storm event, will be collected in a temporary containment vessel (i.e., tank truck or temporary tank). The water will be sampled and analyzed to determine specific treatment requirements prior to treatment/disposal or direct discharge on-site. The preferred method is transport to and disposal of all contact waters at a permitted treatment facility. The Contractor has the option to discharge the liquid on-site to CWM stormwater channels if the water meets applicable discharge limits and monitoring requirements. If the water does not meet regulatory limitations, then the Contractor must dispose of the water at a permitted facility or treat the water on-site until discharge limitations are met.

Liquids contained in the TNT pipeline, groundwater infiltration, and decant waters from sediment recovery/storage will be transported to and disposed at a permitted treatment facility.

Soils

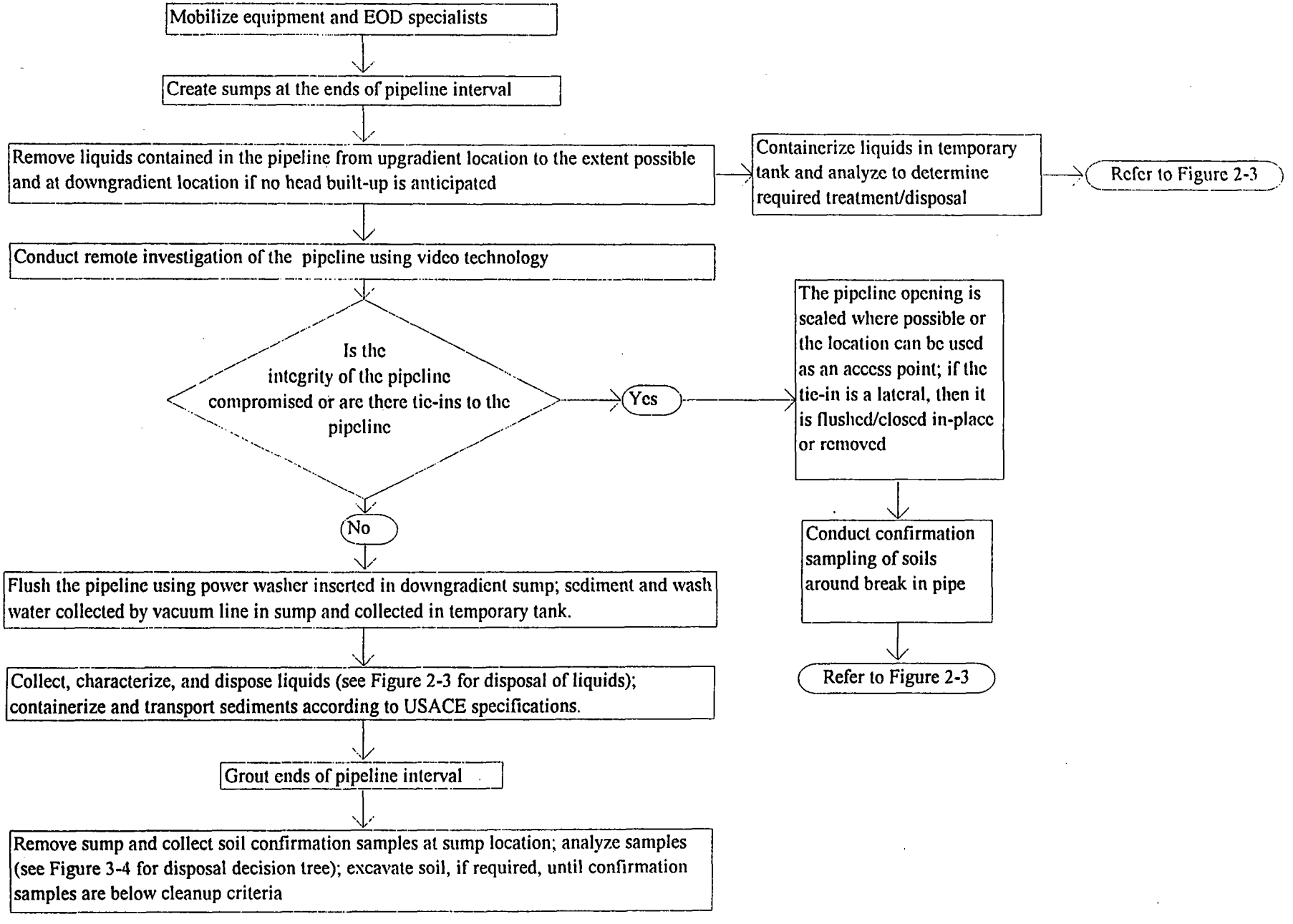
Stockpiled soils will be sampled and analyzed to determine waste classification (see Figure 3-4). Analysis will consist of RCRA waste characteristics, to determine whether it is RCRA hazardous or nonhazardous in accordance with 40 CFR 261 and 6NYCRR Part 371, and other analysis as required by the accepting facility. Soils that are classified as RCRA hazardous, as identified in 40 CFR 261 and 6NYCRR Part 371, will be disposed of at a competitively bid RCRA permitted disposal treatment facility. Soils classified as nonhazardous will be disposed of at a 6NYCRR Part 360 permitted landfill.

3.4.2 Closure In-Place of the Pipeline

This alternative has been developed based on the additional information obtained from the PRDI. The major components of this alternative are as follows (see Figure 3-5):

- Site preparation.
- Removal of the liquids from the pipeline and disposal.
- Identification of potential tie-ins and pipeline integrity.

igure 3-5
Alternative 2 - Closure In-Place of the TNT Pipeline



- Flushing the pipeline to remove sediments and clean the inside of the pipeline.
- Disposal of sediments according to waste characteristics.
- Closure in-place of the pipeline.
- Confirmation sampling and backfilling of excavated areas.

These components are described in greater detail in the following subsections. This alternative is most applicable if the following conditions are satisfied:

- The pipeline has not been broken and plugged at frequent intervals.
- The pipeline is under an existing structure or road.
- The pipeline is intact and no tie-ins exist.

3.4.2.1 Excavation and Removal of Liquids

The Contractor will power wash the pipeline in manageable intervals. The Contractor will be required to install a grout plug at a minimum interval of 250 ft in length. Access to the pipeline must be gained for removal of liquids and power washing operations. The pipeline will be uncovered at both ends of the interval by excavation of surrounding soils. The Contractor will create a temporary lined sump for removal activities at the points the pipeline is uncovered. The temporary lined sump will prevent the release of materials (primarily water) to the surrounding environment during removal and power washing activities.

Excavation activities for creation of the sumps will follow the same guidance as presented in Subsection 3.4.1.1. The excavated soils removed during sump creation will be staged for use as backfill. If excavated soils are suspected of being contaminated, confirmation sampling will be performed to determine if concentrations are above cleanup criteria. If disposal is required, the transporting vehicles shall be loaded and operated in such a manner so as to prevent any spillage or loss of material.

All excavation activities should be planned and executed to minimize the disturbance of surrounding structures and pavements. Excavation of side slopes are the sole responsibility of the excavation Contractor. The working area slopes of the temporary sumps should be cut to inclinations in accordance with OSHA requirements of 29 CFR Part 1926 and EM 385-1-1 (September 1996) for safe working conditions. Cut slope inclinations in these instances must be

designed by a qualified civil or geotechnical engineer. Sheeting and shoring of excavation sidewalls, if needed to protect construction personnel or existing nearby structures (e.g., utilities or roadways), should be designed and constructed and must conform to OSHA requirements. The stability of excavation side slopes and temporary retention systems, as well as the safety of project personnel working within the excavations, is the sole responsibility of the Contractor.

After creation of the temporary sumps, the pipeline will be accessed at the upgradient location if a pressure head due to the pipeline liquids is anticipated. The pipeline can be accessed at a downgradient location if an excessive pressure head does not exist. Excessive pressure was observed in the pipeline below Sta. 25+00. Existing manholes, where present, can be utilized to relieve the pressure head prior to accessing the pipeline. The liquids contained in the pipeline will be removed from the accessed location to the extent possible and transferred into a temporary storage vessel (i.e., tanker truck or temporary tank), sampled, and analyzed to determine specific treatment/disposal requirements. Any liquid entering the sump will be pumped to a temporary storage tank for analysis. The liquids will be stored temporarily until the results of the analysis are available.

3.4.2.2 Soil Stockpiling

Same as previous alternative, refer to Subsection 3.4.1.2.

3.4.2.3 Identification of Potential Tie-Ins and Pipeline Integrity

Prior to removal of the sediments from the TNT pipeline system, the Contractor will be required to investigate previously unidentified tie-ins and determine the integrity of the pipeline through remote methods such as a pipeline (downhole) video or other approved methods. The purpose of this remote investigation is to identify potential openings in the pipeline that could lead to a release of contaminants as a result of power washing activities.

If the remote video procedure identifies areas where the integrity of the pipeline is suspect, the section of the pipeline will be uncovered and inspected. If the pipeline is not able to be sealed, the procedures outlined and discussed in the complete removal alternative would be followed to

remove the identified areas and this location will become the upgradient access point. Otherwise, the pipeline will be sealed to allow for power washing of this section.

If the remote video procedure identifies potential tie-ins or laterals, they will first be uncovered for inspection. Tie-ins to the TNT pipeline will be surveyed and then grouted at the point of the tie-in. Laterals may be closed in place if the integrity of the pipeline allows for power washing without resulting in spills. The lateral will be removed, following the procedures outlined and discussed in the complete removal alternative, if the integrity of the pipeline is deemed unsuitable for power washing.

Pipelines not associated with the TNT pipeline such as the tie-in from the oil/water separator is not part of this interim removal action and will, therefore, be sealed at the tie-in point.

3.4.2.4 Flushing the Pipeline and Removal of Sediments

The TNT pipelines will be power washed with a high-pressure jetting nozzle system. The power wash system will be capable of effectively removing sediments from the pipeline and cleaning the inner surfaces of the pipe without causing damage to the pipeline. The power wash system shall also be capable of removing debris that may stop the forward travel of the wash system.

Access to the TNT pipeline for insertion of the power wash system will be gained through the temporary sumps. These sumps will be lined and used to collect the wash water and sediments as they are removed. The power wash system will be inserted in the downstream end of the interval and extended into the pipe at workable intervals until it reaches the next temporary sump. Each pipeline segment will be flushed once and then sealed to prevent the backwash of the next pipeline section from entering the washed section. When an interval has been power washed, the Contractor will proceed with the next interval and continue the process until all TNT pipeline sections designated for closure in-place have been completed.

There may be roots, material plugs, or other obstructions in the lines to stop the progress of the power wash system. If this situation is encountered, the Contractor will try to loosen the blockage by working the power wash system from both the sides of the blockage. If removal of the

sealed and the laterals removed. Also, the pipeline is located just below the ground surface in this section, which creates advantageous conditions for complete removal of the pipeline due to the shallow excavation required for removal. Complete removal of the pipeline also minimizes the potential for interference with facility operations in this area.

Section B-C

Section B-C is separated into two subsections (B-C1 to B-C2 and B-C2 to B-C3) as indicated in Figure 4-1.

The recommended alternative for Section B-C1 to B-C2 is closure in-place. The existing conditions that create an advantageous situation for closure in-place include an extended interval of pipeline for flushing without suspected tie-ins and proximity of the pipeline to the current north salt pond, which could prevent excavation. Historic maps show that the laterals to the former production buildings are located on either side of the current pond. These should be located and removed or closed in-place and sealed prior to flushing the main pipeline.

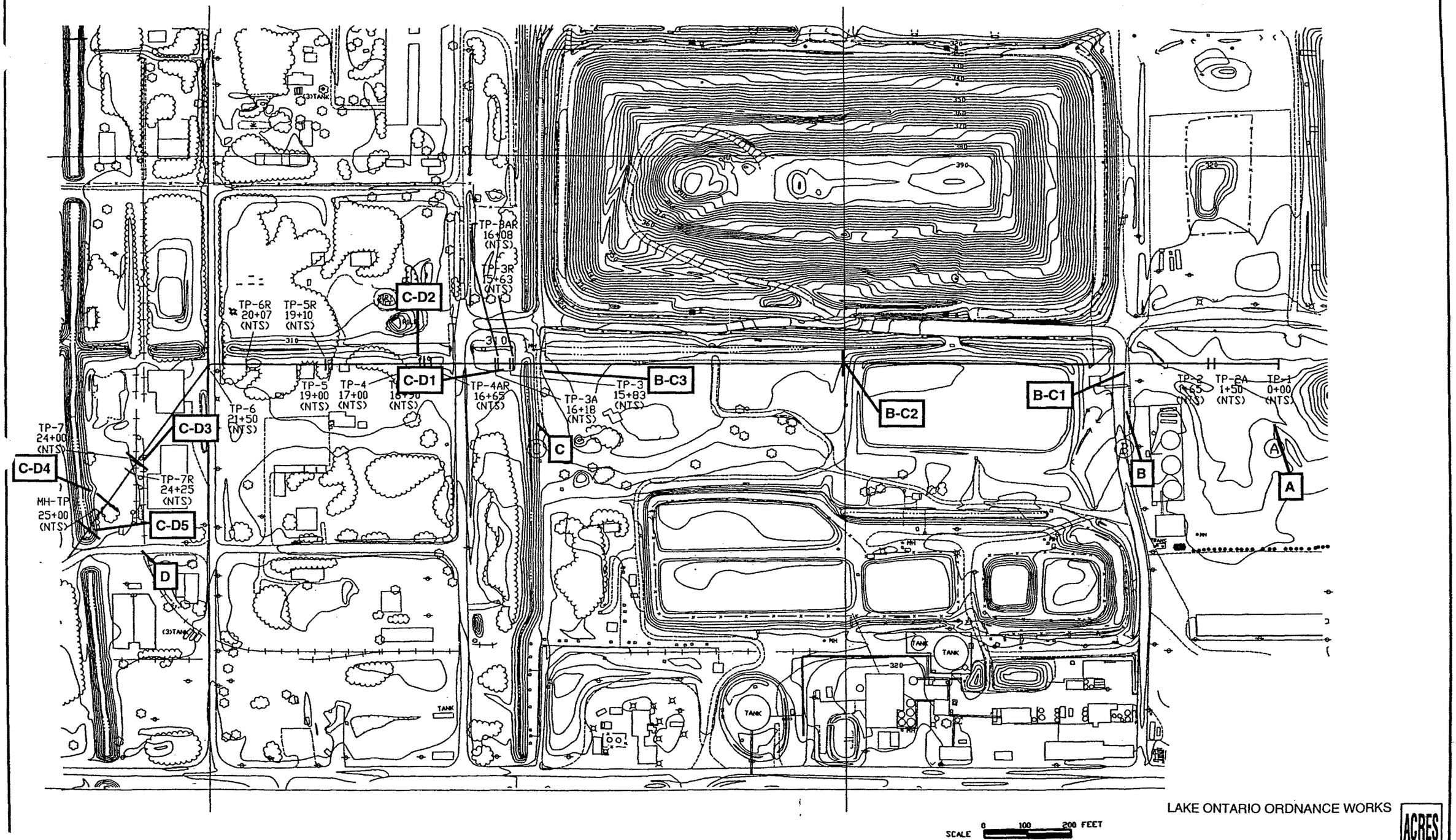
The recommended alternative for Section B-C2 to B-C3 is complete removal of the pipeline. The conditions of the pipeline in this subsection are similar to the conditions encountered in Section A-B; the pipeline has previously been opened in various places and the pipeline is relatively shallow. Laterals have also been identified in this section.

Section C-D

Section C-D is separated into four subsections (C-D1 to C-D2, C-D2 to C-D3, C-D3 to C-D4, and C-D4 to C-D5) as indicated in Figure 4-1.

The recommended alternative for Section C-D1 to C-D2 is complete removal of the pipeline. The conditions of the pipeline in this section are similar to the conditions encountered in Section B-C2 to B-C3.

The recommended alternative for Section C-D2 to C-D3 is closure in-place. The pipeline in this interval is expected to be intact. In addition, the pipeline is located under structures (including the



LAKE ONTARIO ORDNANCE WORKS

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FIGURE 4-1 RECOMMENDED TNT PIPELINE INTERVALS FOR ALTERNATIVES

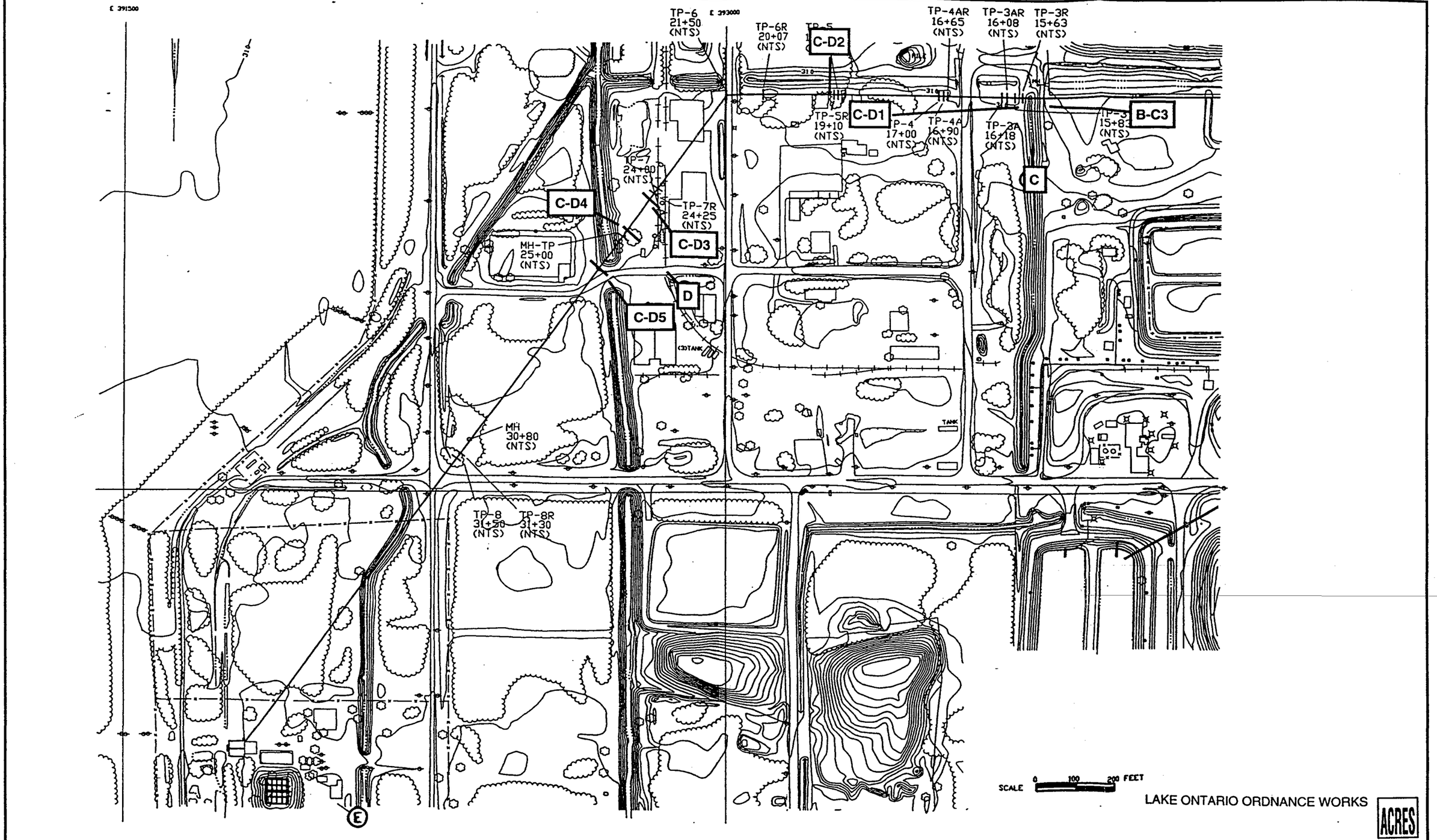

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FIGURE 4-2 RECOMMENDED TNT PIPELINE INTERVALS FOR ALTERNATIVES

concrete foundation of the Area 7 process area and Building #16) and railroad tracks in this interval, which would require removal of these structures for excavation of the pipeline.

The recommended alternative for Section C-D3 to C-D4 is complete removal of the pipeline. The primary justification for complete removal is the number of places the pipeline has been accessed in this interval. Complete removal will also be more difficult in this interval due to the depth of the pipeline below the ground surface.

The recommended alternative for Section C-D4 to C-D5 is closure in-place.

Section D to the Wastewater Treatment Plant

The recommended alternative for Section D to the Wastewater Treatment Plant (refer to Figures 4-1 and 4-2) is closure in-place. The pipeline in Section D is at a depth that would require deep excavations of up to 9 to 12 ft below grade to uncover and completely remove the pipelines. The pipeline in this interval is expected to be intact and not contain tie-ins. However, this has not been confirmed because it was not possible to investigate this section of the pipeline due to the gravity pressure head of the liquids in this section and the presence of oil/water containing PCBs in the south line. The potential exists for obstructions (manmade or otherwise) as well as sediment in this section. It will be necessary to first dewater this section so that remote video inspection can take place to identify tie-ins, blockages, and integrity of the pipeline.

APPENDIX A

RESPONSE TO COMMENTS

30% Preliminary Design - Preliminary Design Analysis Report
Lake Ontario Ordnance Works
Towns of Porter/Lewiston NY
June 4, 1997

Garger, CENAB-EN-:

Comment 671753-24, page 1-10

Section 1.3 - add the word "critical" between "non-time" and "removal actions"

Response:

Revision will be made.

Comment 671753-25, page 1-13

Section 1.4, 2nd paragraph, line 4 - suggest adding the words "associated with landfill expansion" after "construction activities".

Response:

Clarification will be made.

Comment 671753-26, page 2-13

Section 2.1.9, line 5, - delete one of the "will be completed by the contractor" statements.

Response:

Deletion will be made.

Comment 671753-27, page 2-39

Section 2.3.1 - there appears to be some text missing between page 2-26 and 2-39.

Response:

The repeated last two lines on page 2-39 from the proceeding paragraph will be deleted.

Comment 671753-28, page 3-15

Section 3.3.2, remove this section since it is inappropriate to discuss the bioremediation as part of this effort.

Response:

This section will be revised to state that following the removal of sediments from the pipeline the contractor is responsible for the containerization and transport of the sediments to a designated treatment/disposal facility. The evaluation and final treatment/disposal of the pipeline sediments is being performed through a separate research and development contract under the direction of USACE, Baltimore District.

Since this effort is not within WESTON's scope of work, it is our understanding that the USACE, Baltimore District will provide prior to the 90% design submittal, the requirements for moisture content, containerization, and transport of the sediments and contaminated soils to the designated treatment/disposal site. All references to bioremediation will be deleted as directed.

Comment 671753-29, page 3-21

Section 3.4.1.1 - add the reference for the requirements for excavation outlined in EM 385-1-1, 3 Sept. 96, Section 25.

Response:

Reference will be added.

Comment 671753-30, Appendix

General comment: What will be the clean up criteria for asbestos in soil around BLDG. 6 for the purposes of estimating extent of contamination and cost of remediation.

Response:

Based on our discussion at the 30% Design meeting on 20 May 1997, no clean-up criteria for asbestos in soil was known by the team. CENAB has since contacted NYSDEC regarding this matter, but Kent Johnson (NYSDEC) was not aware of a specific criteria. Jim Davis (WESTON) mentioned that the clean-up of asbestos fragments observed outside of enclosed buildings at the Childersburg Army Ammunitions Plant was conducted by collecting and bagging for disposal all visible pieces by trained asbestos abatement workers.

Based on the areal extent and depth of asbestos containing materials determined from the proposed survey, potential options will be evaluated and presented for review and comment.

Noble, CENAB-EN-HI:

Comment 671753-48, page 2-14, Tab 2-1

Also applies to page 3-10, section 3.2. The NY guidance memorandum cited for soil clean-up levels, HWR-92-4046, has an update which came out in 1994. Perhaps there is even a 1996 update. Please research and use the most current guidance from the state of New York.

Response:

WESTON will obtain the most current update of the NYSDEC guidance memorandum and revise if appropriate, the clean-up criteria referenced in the DAR.

Response to Comments
30% Preliminary Design - Preliminary Design Analysis Report
Lake Ontario Ordnance Works
Towns of Porter/Lewiston NY
June 4, 1997

Marsh, CENAB-EN-H:

Comment 6671753-107, page 2-13, section 2.1.10, paragraph 2

This section indicates that a 200 SF grid will be utilized for confirmation sampling. This needs to be evaluated based on the site.

Response:

As discussed at the 30% design meeting on 20 May 1997, the confirmation sampling will be performed after the designated limits of the Area A excavation are completed and initial field screening methods do not indicate elevated concentrations of organic compounds. If sustained PID/FID readings above background are observed on soil samples removed from the walls of the excavation, the contracting officer may direct the contractor to continue excavation or perform verification sampling. For the excavation walls a grid area of 400 sq. ft (10' x 40' narrow side wall) to 550 sq. ft. (10' x 55', long side wall) or a total of 20 sidewall samples is recommended to be collected and analyzed using rapid (24 hr or less) turn-around analysis. The bottom of Area A will be excavated to the depth clean-up criteria are met (estimated at 10 ft) or to 6 inches below the top of the clay layer, which ever comes first. It is recommended that confirmation samples be performed on the bottom of the excavation to document the level of clean-up, in the case that the clay layer is encountered first, the results would not be used to extend the depth of the excavation. A grid area of approximately 1100 sq. ft. (20' x 55') or 8 total floor samples is suggested. The total confirmation samples would therefore be 28, if no sample exceeded the clean-up criteria and no additional excavation beyond the initial limits was performed

Comment 6671753-108, page 2-13, section 2.1.10, paragraph 3

This section indicates that additional excavations will be 2 ft internals on the walls and 1 ft intervals on the floor. Explain why these are different.

Response:

As discussed at the 20 May 1997 meeting, the base of the excavation will be limited to the depth clean-up criteria are met (estimated at 10 ft) or 6 inches into the clay layer, which ever comes first. Due to the potential of encountering the clay layer above the estimated depth, the thickness of the lift to be removed was limited to 2 ft. Furthermore, it is on a practical level easier to remove a 1 ft lift on the bottom of an excavation then the side wall. Excavation of the side walls will be extended at 2 ft intervals or as directed by the contracting officer based on field screening techniques and confirmation sampling and analysis.

Comment 6671753-109, page 2-14, Table 2-1

There are several blank cells on this table. If there is no value for a specific cell, please identify (i.e., dash -). This will indicate that there is no value, and not that one has been forgotten.

Response:

The table will be revised to show either a number or dash (signifying no criteria exists) in each cell.

Comment 6671753-110, page 2-25, section 2.2.10, paragraph 2

Same comments as numbers 2 and 3 above.

Based on the discussions at the 20 May meeting, the following confirmation sampling program is proposed for Area B:

- Contaminated pond sediment (estimated volume 3,000 yd^3 based on a 24,500 ft^2 area 3 ft in depth) - Following removal of the sediment to a depth of 3 ft, the area will be screened with a FID/PID. If sustained readings above background are observed the contracting officer may direct the contractor to excavate and remove another foot or collect verification samples using an approximately 4,000 sq. ft grid area (5-6 samples total). Based on the results of the 24 hr. turn around verification sampling, an additional 1 ft of material will be excavated and removed from within the designated grid.

- Contaminated berm materials at approximately 6,000 yd^3 (based on 33,000 ft^2 of berm at an average height of 5 ft): similar approach suggested for a total of 8-9 samples.

  Contaminated mounded sediment and soil within the ponded area estimated at 1,300 yd^3 (based on a 7,150 ft^2 area with an average thickness of 5 ft): Similar approach recommended including first, excavation to 5 ft below the existing surface, field screening and then either further excavation or verification sampling. Total samples for the first round of verification sampling is 2 samples.

- Contaminated soils within the former surface depression south of the present burn pit boundaries, estimated at 1,700 yd^3 (based on the depression dimensions of 100 ft long by 25 ft wide by 18 ft deep). Since this is a below

ground excavation, sidewall and floor confirmation samples are recommended. The sidewall confirmation sampling would occur after field screening and be performed on an approximate grid area of 450 sq. ft (18' x 25' narrow sidewall) or one sample per side, and of 450 sq. ft (9' x 50' on long sidewall) or 4 samples per side. The total sidewall samples would then be 10. The floor samples would be taken using a grid area of 625 sq. ft (25' x 25') or 4 samples. If the clay layer is encountered the excavation will proceed 6 inches into the clay layer and confirmation samples collected. No further excavation will occur after the top 6 inches of the clay layer is removed. The results of the confirmation samples, at this depth will be used only to document clean-up achieved. If the clay layer is not encountered, excavation will proceed until clean criteria are met (estimated at 18 ft).

Comment 6671753-111, page 3-7, section 3.1.3, paragraph 2

Change the date to October 1996.

Response:

Date will be changed.

Comment 6671753-112, page 3-7, section 3.1.3, paragraph 5

This comment is just a note. This section indicates that a drawing exists that discharge from the sludge basins was to the North TNT line. This is the first that this reviewer has heard of this drawing. It would be beneficial to see that drawing.

Response:

The referenced drawing has been provided with these responses.

Comment 667173-113, page 3-8, section 3.1.4, paragraph 2

This section indicates that the farthest downstream sampling point was Station 25+00, this does not agree with 3.1.3 paragraph 4 (30+80). Coordinate.

Response:

The correction will be made.

Comment 6671753-114, page 3-11, section 3.3.1, paragraph 1

The third and fourth sentences do not agree. Coordinate.

Response:

The word compares in the forth sentence will be changed to contrasts.

Comment 6671753-115, page 3-15, section 3.3.2

This reviewer does not agree with this section. Further discussions between Weston and the Corps are warranted.

Response:

See response to comment Number 671753-28 (Garger).

Comment 667153-116, page 3-23, section 3.4.1.3

This section indicated that the pipeline will be dewatered from the upstream access point if a pressure head exists. As long as the head is not excessive (i.e. gradient above ground surface), the head will aid in dewatering the pipeline from the downgradient access point. Suggest discussions on this matter.

Response:

The text will be revised and reflected in the specifications that the pipeline may be dewatered from the downgradient access point if an excessive pressure head does not exist. Excessive pressure was observed in the pipeline below station 25+00. The contractor shall utilize the existing manholes, where present, to release the pressure head prior to accessing the pipeline.

Comment 6671753-117, page 3-24

1. Paragraph 2 - This section indicates that confirmation samples will be collected at 25 ft. internals. This is extremely excessive and unnecessary. The interval will need to be evaluated somewhat based on field conditions, however, and average interval of several hundred feet (200-500') is more reasonable.

2. Paragraph 3 - This section indicates removal and resampling at 6" intervals, this may not be practical during construction activities. This will need to be discussed.

The use of field screening methods during construction activities may be appropriate. These should be added to the next submission of plans/specifications.

Response 1:

Based on discussions at the May 20 meeting, the confirmation samples along sections of the pipeline that have been completely removed will be based on visual evidence of staining and spillage and through field test kits for TNT. The specifications will require visual inspection and field testing prior to collecting and analyzing soil samples. At a minimum, confirmation samples will be taken at the ends of each removed/or flushed section and at 250 ft for sections less then 500 ft and at 500 ft intervals for sections greater then 500 ft intervals for sections completely removed.

Response 2:

As discussed, the use of field test kits for TNT will be used by the contractor to identify remaining hot spots. It is suggested that the field test kits be used to determine if the clean-up criteria is met or whether additional excavation is needed. Laboratory confirmation sampling will then be used to verify field test results that indicate clean-up criteria has been attained.

The use of field screening methods will be added to text and the specifications.

Comment 6671753-118, page 3-25, section 3.4.1.6

Soils/sediments - This section will need to be modified based on discussions regarding the use of biotreatment methods.

Response:

This section will be revised to state that the contractor is responsible for containerization and transport of the pipeline sediments and contaminated soils (soils that exceed clean-up criteria and cannot be backfilled) to a designated treatment/disposal facility as directed by USACE, Baltimore District. The contractor is responsible for the disposal of the concrete and pipeline from those sections that are designated to be removed. The contractor is also responsible for treatment/disposal of waters collected from the pipelines and excavations.

WESTON is to confirm that local facilities will accept the concrete and pipeline materials based on field screening using Webster's Reagent to confirm the materials are non-detonable. WESTON will also confirm that CWM will accept liquids for the pipeline.

Comment 6671753-119, page 3-28, section 3.4.2.1, paragraph 3

This section may need to be revised based on discussions regarding use of downstream access points.

Response:

See response to comment Number 6671753-116 (Marsh).

Comment 6671753-120, page 3-29, section 3.4.2.3, paragraph 2

This section indicates that laterals will be removed. The potential to leave them in place needs to be provided.

Response:

WESTON will review the available information to determine which laterals are likely intact and could be flushed in place. The specifications will allow closure in-place of the laterals unless the condition of the pipeline precludes the use of this method.

Comment 6671753-121, page 3-30, section 3.4.2.4, paragraph 2

This section should require a liner at the sumps.

Response:

The section will be revised to reflect the requirements of a liner at the sumps.

Comment 6671753-122, page 4-1, section 4.1

This section will need to be revised based on discussions regarding the use of biotreatment.

Response:

See responses to comment Number 6671753-115 (Marsh).

Comment 6671753-123, page 4-2, C-D1-C-D2

The potential to leave this section in place needs to be evaluated.

Response:

The cost evaluation was provided at the request of CENAB at the previous meeting on the results of the PRDI held on 22 January 1997. Based on the discussion at the 30% Design meeting, this section will not be included in the 60% Design submittal.

Comment 6671753-124, page 4-7, C-D3-C-D4

Based on the depth to pipe in this section the potential to leave this section in place needs to be evaluated.

Response:

Based on the discussion at the 30% Design meeting on 20 May 1997, the sections of the pipeline that will be indicated for closure in-place are shown on the marked-up Figures 4-1 and 4-2. These revisions will be reflected in the 60% Design submittal.

Comment 6671753-125, page 4-8, Table 4-1

There are different mobilization/demobilization rates for the different treatment meth Explain.

Response:

See response to comment Number 667153-123 (Marsh).

Comment 6671753-126, Appendix A

CWM Property - Add Transportation/Handling Explosives.

Response:

As discussed at the 20 May meeting, CENAB will determine where the contractor is to transport the pipeline sediments and contaminated soil and will provide to WESTON the requirements for moisture content, containerization and transportation of these materials. WESTON will provide CENAB with information gathered to date regarding transport of explosives.

Comment 6671753-127, Appendix A

Drawing Index - This section indicates that profile drawings for the pipelines will be provided. Do these exist or will they be generated?

Response:

The profile drawings will be prepared using the depth to pipeline measurements taken during the PRDI.

Kent Johnson, NYSDEC:

Comment 1: Page 2-7, Section 2.1.5, Excavation and Removal of Soils and Drums:

Additional details are needed to describe what is meant by the statement - "First, the area must be surveyed to establish the initial limits of contamination".

Response:

This statement will be clarified to state that the area define in the EE/CA and shown on the design drawings will be staked out by the contractor. Acres has surveyed these areas and will provide WESTON with the coordinates for the design drawings.

Comment 2: Page 2-9, Section 2.1.6, Second Paragraph:

Please clarify the meaning of the second sentence of this paragraph.

Response:

This sentence will be deleted.

Comment 3: Page 2-9, Section 2.1.6, First Paragraph:

Use of roll-off containers for excavated soils which are contaminated will minimize the need for confirmation sampling of this stockpile area.

Response:

This section will be revised to allow for the use of roll-off containers for excavated soils. The specifications will also reflect this.

Comment 4: Page 2-10, Section 2.1.7:

For the treatment and discharge of collected groundwater and surface waters, the COE should check the costs and feasibility of: CWM treatment, local POTW treatment, and/or obtaining a SPDES permit.

Response:

WESTON will investigate the feasibility of these options and allow the contractor to select among the feasible options for the most cost effective method.

CWM will be contacted to discuss this issue.

Comment 5: Page 2-13, Section 2.1.10:

Confirmation samples should be analyzed for Hazardous Substance List Volatile Organics.

Response:

Since these areas have already been thoroughly investigated and the containments of concern identified, it is recommended that a partial VOC list be used for confirmation sampling to allow for rapid turn-around of samples and minimization of both potentially contaminated groundwater and surface water collection, treatment and discharge.

Comment 6: Page 2-14, Table 2-1:

The Table must also include the clean-up criteria for water used in flushing the TNT pipelines.

Response:

We request further discussion of this comment with NYSDEC. The objective of the Interim Removal Action is to remove the material that has been identified as a potential risk. After flushing in-place, removal of the pipeline contents will be verified with a video camera. No confirmation sampling is proposed.

Comment 7: Page 2-23, Section 2.2.9:

Please see previous comments on treatment and discharge to surface water.

Response:

See response to comment No. 4.

Comment 8: Page 2-25, Section 2.2.10:

Confirmation samples should be analyzed for Hazardous Substance List Volatile Organics, Lithium and Boron.

Response:

See response to comment No. 5.

Comment 9: Page 2-41, Section 2.3.2, Asbestos:

Please cite the 6 NYCRR part 360 regulation for an in-place closure cover system.

Response:

Since asbestos is the only "solid waste" present in this area, an alternative cover that allows for the maintenance of "wet" moisture conditions may be more appropriate then an impermeable Part 360 cover system. CENAB is also still evaluating the options for remediation of the loose asbestos in this area.

Comment 10: Page 2-41, Section 2.4.4:

The pipeline camera survey of the chemical waste sewer system should include the entire system, to the extent possible.

Response:

The camera survey is proposed for the chemical waste sewer line shown on the drawings to be flushed.

Comment 11: Page 3-8, Section 3.1.3:

Please provide details on the statement: "All of the outlet lines from the oil/water separator are scheduled to be sealed with cement grout by CWM."

Response:

CWM is to plug the discharge points from the oil/water separator identified during the PRDI.

Comment 12: Page 3-15, Section 3.3.2:

A determination as to the appropriateness of bioremediation of the pipeline sediments cannot be made at this time. Once the pilot study being conducted by the USACE Waterways Experimental Station is completed and a report is submitted, through review of the technology will be performed.

Response:

The sections discussing bioremediation will be deleted as directed by CENAB.

Comment 13: Page 3-18, Section 3.3.3:

Has any progress been made with the New York National Guard to secure access to their property in case crystalline materials are encountered?

Response:

CENAB to comment.

Comment 14: Page 3-29, Section 29, Section 3.4.2.4:

If feasible, the filtering and recirculation of wash water used for power washing the pipelines may result in a reduction in the amount of water used and treated.

Sections of the pipeline which have the presence of sediment and debris indicated by the video survey must have a post-washing confirmation survey to assure satisfactory decontamination of the pipe.

Response:

Concur.

Comment 15: Page 3-31, Section 3.4.2.6:

What are the proposed parameters of analysis for the TNT line confirmation sample?

How will the decontamination of the TNT pipelines be confirmed?

When back filling the temporary sumps/access points, the fill material should be of sufficiently low permeability to prevent the pipeline and/or bedding from becoming a preferential pathway to contaminant migration.

Response:

Confirmation that the contents of the pipeline have been removed will be performed using a video camera. No confirmation sampling is proposed.

The pipeline will be plugged using a bentonite grout at the access points. The sump areas will be lined and backfilled with soils that do not exceed the clean-up criteria. The local soils are clayey and generally possess a low permeability.

Comment 16: Page 4-7, Section 4.1:

Is location D4 the point where the chemical waste sewer system ties in?

Response:

This is the approximate location where it is suspected that the tie-in to the oil-water separator is located. The actual point of connection was not located during the PRDI.

APPENDIX B

INDEX OF PLANS AND SPECIFICATIONS

APPENDIX B
LAKE ONTARIO ORDNANCE WORKS (LOOW)
CHEMICAL WASTE MANAGEMENT (CWM) PROPERTY

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01440	Contractor Quality Control
01450	Chemical Data Quality Control
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LAKE ONTARIO ORDNANCE WORKS (LOOW)
CHEMICAL WASTE MANAGEMENT PROPERTY(CWM)

Drawing Index — 60% Design

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APPENDIX C

GENERAL SITE PLAN

Note: See Plate 2 of the Drawings

April 8, 1997
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LAKE ONTARIO ORDNANCE WORKS
SCOPE OF WORK
ASBESTOS SURVEY – SOMERSET GROUP PROPERTY

1 INTRODUCTION

The Somerset Group property is located on a portion of former Air Force Plant 68 (AFP-68), which was constructed in 1957 at the former Lake Ontario Ordnance Works site located in Niagara County, New York. AFP-68 was decommissioned in 1959 while in pilot-plant status. As a result of the construction, operation, and decommissioning of AFP-68, various presumed asbestos-containing materials (PACMs) are present throughout the Somerset Group property.

Under the Defense Environmental Restoration Program, the U.S. Army Corps of Engineers (USACE) is addressing asbestos contamination which poses a potential health risk on the Somerset Group property. This Scope of Work defines the services to be performed to quantify the asbestos-containing materials for the purpose of providing information for bid solicitation for an interim remedial action.

PACMs present at the Somerset Group property include corrugated wall panel, pipe insulation, hopper insulation, and bagged asbestos mortar. This Scope of Work identifies those tasks to be performed to quantify only loose and friable asbestos-containing materials. Those materials that do not appear to be loose or in a deteriorating condition, such as the corrugated panels attached to buildings, will not be included in the quantity estimates.

2 SCOPE OF SERVICES

The scope of services to be provided has been divided into three tasks: asbestos survey; asbestos sampling/analysis; and reporting.

2.1 Asbestos Survey

Acres will perform a field survey to quantify loose asbestos-containing materials on the building floors and ground surface. The surface area and vertical extent of the loose asbestos materials on building and ground surfaces will be estimated. Intact asbestos-containing insulation around piping will be documented along with the observed characteristics of the material (e.g., deteriorated, intact, partially fallen off, etc.). The field survey will include written and photographic (or video) documentation.

2.2 Asbestos Sampling/Analysis

Contamination of building surfaces and exterior ground surfaces has occurred as a result of the widespread distribution and deteriorating condition of some asbestos-containing materials. The area surrounding Building No. 6 is a particular area of concern with respect to asbestos contamination. Acres proposes to perform sampling and analyses of site soils around Building No. 6 to quantify the amount of asbestos contamination.

In order to quantify the lateral extent of asbestos contamination in site soils concentrated around Building No. 6, Acres will establish a 100 ft by 100 ft grid around the building as indicated in Figure 1. Acres will then collect representative samples of the upper 4 inches of the surface soils at grid node locations. Samples will not be collected where grid nodes are located on concrete or other structural surfaces. However, additional surface soil samples will be collected in the general building vicinity to result in a total of 26 soil samples. All asbestos sampling will be conducted by certified asbestos technicians using OSHA-approved asbestos sampling procedures per 29CFR 1926.1101.

Upon collection, Acres will submit the samples to the analytical laboratory for asbestos analyses by polarized light microscopy (PLM).

2.3 Reporting

Upon receipt of all analytical results, Acres will prepare a bound summary report providing written observations, photographs, laboratory results, and quantity estimates. The report will also present recommendations for the most cost-effective approach for removal or encapsulation of asbestos-containing material that poses an immediate potential risk (e.g., covering areas around the building which contain loose asbestos material on the ground surface, encasing intact pipe insulation, etc.). Acres will also evaluate methods of stabilization through encasement in areas where asbestos-containing material is not currently loose but may pose a future threat of release due to exposure.

Acres will provide 10 copies of a bound draft report. Acres will provide one copy of responses to review comments on the draft report to Weston. Acres will then incorporate agreed-upon comment responses into a final report and submit 10 copies of the final report to Weston.

Acres' estimate assumes that the field survey and asbestos sampling will be performed when the ground surface is free of snow cover.

ACRES

SUBJECT: FIGURE 1

ASBESTOS SAMPLING LOCATIONS

Calc. By KC Date 4/8/97
Ck'd. By _____ Date _____
App. By _____ Date _____
Calc. No. _____ Sheet 1 Of 1