

**APPENDIX B**  
Statement of Work

United States of America and  
State of Connecticut

v.

American Hoechst Corporation, et al.

## APPENDIX B

### RD/RA STATEMENT OF WORK Solvents Recovery Services of New England, Inc

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RD/RA STATEMENT OF WORK  
Solvents Recovery Services of New England, Inc

I. INTRODUCTION AND PURPOSE

This Remedial Design/Remedial Action (RD/RA) Statement of Work (SOW) defines the response activities and deliverable obligations that the Settling Defendants are obligated to perform in order to implement the Work required under the Consent Decree at the Solvents Recovery Services of New England, Inc. (SRSNE) Superfund Site in Southington, CT (the "Site"). The activities described in this SOW are based upon the United States Environmental Protection Agency (EPA) Record of Decision for the Site signed by the Office Director, Office of Site Remediation and Restoration, EPA New England, on September 30, 2005.

Sections II and III of this RD/RA SOW provide definitions of terms used in this document, and an overview of the Remedial Action selected for the Site. Sections IV thru IX of this RD/RA SOW set forth further requirements and procedures with which the Settling Defendants shall comply throughout the performance of Remedial Design, Remedial Action, Compliance Monitoring and Compliance Reporting.

II. DEFINITIONS

The "Site" and "Settling Defendants" shall have the same meanings as provided in the Consent Decree. Other definitions provided in the Consent Decree are incorporated herein by reference. In addition, the following definitions shall apply to this SOW:

- A. "Remedial Design" or "RD" shall mean an identification of the technology and its performance and operational specifications, in accordance with all applicable federal, state, and local laws, including, but not limited to:
1. all computations used to size units, determine the appropriateness of technologies, and the projected effectiveness of the system;
  2. materials handling and system layouts for the excavation, if required, and treatment of soils, the extraction and treatment of groundwater, and the decontamination and demolition of facilities to include size and location of units, treatment rates, location of electrical equipment and pipelines, and treatment of effluent discharge areas;
  3. scale drawings of all system layouts identified above and including, but not limited to, excavation cross-sections, and well cross-sections;

4. quantitative analysis demonstrating the anticipated effectiveness of the Remedial Design to achieve the Performance Standards;
  5. technical specifications which detail the following:
    - a. size and type of each major component; and
    - b. required performance criteria of each major component;
  6. description of the extent of ambient air monitoring including equipment, monitor locations, and data handling procedures; and
  7. description of access, easements and/or other institutional controls required, to be supplied with the construction plans and specifications.
- B. Particular areas within the Site are defined as follows and are shown on ROD figures 1, 4, 5 and 6b, which are included in Attachment A to this SOW:
1. SRSNE Operations Area (approximately 4 acres);
  2. Cianci Property (approximately 10 acres) and concrete culvert;
  3. Railroad Right-of-Way (easement between the Operations Area and the Cianci Property);
  4. Overburden NAPL Area (approximately 1.5 acres, before the northwestern corner has been fully delineated); and
  5. Those areas where groundwater contamination from the Site (the "groundwater plume") has come to be located, including the northern portion of the Curtiss Street Well Field (a.k.a. Town Well Field).
- C. "NTCRA 1 and NTCRA 2 Groundwater Extraction and Treatment System" or "NTCRA 1/2 Groundwater System" shall refer to the on-site combined groundwater extraction and treatment system and treatment implemented under Administrative Orders on Consent I-94-1045, effective October 4, 1994, and, I-97-1000, effective February 18, 1997.
- D. "Hydraulic Containment and Treatment System" shall refer to the NTCRA 1 and NTCRA 2 Groundwater Extraction and Treatment System, as operated at the Site following entry of the Consent Decree and as may be modified thereafter.
- E. "Monitored Natural Attenuation" shall mean the reduction of contaminants in groundwater in the overburden and bedrock aquifers underlying the Site, and non-

aqueous phase liquid (“NAPL”) in the bedrock aquifer underlying the Site and overburden aquifer outside the Overburden NAPL Area, through natural mechanisms and includes long-term monitoring. “MNA Parameters” shall mean anions (sulfate, sulfide, chloride, nitrate, nitrite); total organic carbon; iron (ferric, ferrous); divalent manganese; light hydrocarbons (methane, ethane, ethene); dissolved oxygen; oxidation/reduction potential; pH; alkalinity and temperature.

- F. “Severed Plume” shall mean that portion of the groundwater plume in the overburden and bedrock aquifers underlying the Site that is not captured by the Hydraulic Containment and Treatment System.
- G. “CT RSRs” shall refer to the Connecticut Remediation Standards Regulation, as amended.
- H. “DEC” shall refer to the Direct Exposure Criteria presented in the CT RSRs, as amended.
- I. “PMC” shall refer to the Pollutant Mobility Criteria presented in the CT RSRs, as amended.

### III. SELECTED REMEDY

The Record of Decision (ROD) for the Site, dated September 2005, describes the Remedial Action for the Site. The remedy to be performed by the Settling Defendants is as follows:

- A. Design, construct and operate an in-situ thermal treatment system to treat contamination in the Overburden NAPL Area.
- B. Excavate contaminated soil and wetland soil from the Cianci Property and culvert outfall. Consolidate excavated soils with contaminated soil in the Operations Area unless EPA determines that contaminated soils should be excavated and disposed of off site due to PCB contamination exceeding TSCA levels, consistent with Section L of the ROD.
- C. Remove existing concrete culvert; re-route drainage from the Site to the Quinnipiac River through a new, impermeable pipe.
- D. Design and construct a low-permeability, multi-layer, composite RCRA Subtitle C cap that meets the requirements of CT RSRs over the contaminated soil in the Operations Area and along the Railroad Right-of-Way.
- E. Design, construct and/or operate and maintain, as necessary, a hydraulic containment, extraction and treatment system for groundwater in the overburden

and bedrock aquifers. Modify the hydraulic containment and treatment system as necessary to meet changes in hydrogeologic or other Site conditions including, but not limited to, the installation of additional containment wells in the event that the Southington Water Department/Town of Southington provides written notification, in accordance with the Memorandum of Agreement to be negotiated under Section V.B.3 of this SOW, of its intent to activate municipal production wells located in the Curtiss Street Well Field.

- F. Monitor natural attenuation of the groundwater in the Severed Plume that exceeds cleanup levels in Table L-1 of the ROD. Monitor natural attenuation of the NAPL in the overburden aquifer that lies outside the Overburden NAPL Area and in bedrock aquifer underlying the Site.
- G. Implement any institutional controls determined by EPA to be necessary to restrict future use of Site property and groundwater. Monitor compliance and enforce, and/or assist EPA and CT Department of Environmental Protection (DEP) in enforcing, such institutional controls.
- H. Restore the functions and values of any and all habitats affected by the remediation.
- I. Assist EPA in performing five-year reviews to evaluate effectiveness and protectiveness of the remedy.
- J. Design and implement a long-term monitoring program to evaluate the performance of the Hydraulic Containment and Treatment System and the overall effectiveness and protectiveness of the remedy, including the MNA component.
- K. Implement changes to the selected remedy to meet the ROD requirements that may be necessary as a result of remedial design and construction processes.

#### IV. PERFORMANCE STANDARDS

The Settling Defendants shall design, construct, operate, monitor, and maintain the Remedial Action in compliance with all applicable or relevant and appropriate requirements ("ARARs") identified in the ROD and all requirements of the Consent Decree and this SOW.

The Settling Defendants shall achieve the following Performance Standards for the contaminated groundwater, soil and wetland soil, and the NAPL that is present in the subsurface in the overburden and bedrock aquifers. The Performance Standards for the SRSNE Site are as follows:



A. Cleanup Levels

1. Groundwater

Interim Cleanup Levels for groundwater contamination are specified by EPA in Table L-1 of the ROD and are included in Attachment A of this SOW. Interim Cleanup Levels shall include all cleanup levels specified in Table L-1 of the ROD and in accordance with VIII.F of this SOW, ARARs, and newly-promulgated ARARs and modified ARARs which call into question the protectiveness of the remedy. While the levels in Table L-1 are consistent with ARARs, the levels are considered Interim Cleanup Levels because the cumulative risk posed by these contaminants, after attainment of the Interim Cleanup Levels may still exceed EPA's risk management standard. Pursuant to the requirements of this section, the Settling Defendants are required to attain the Interim Cleanup Levels and any other Modified Cleanup Levels established by EPA.

The Settling Defendants shall remediate the groundwater at the Site until the concentration of each groundwater contaminant achieves compliance with the Interim Cleanup Level for the contaminant at every well that is part of the groundwater containment, MNA and compliance monitoring system within the Site and at any well that EPA requires to be installed for adequate verification that Interim Cleanup Levels and Performance Standards have been achieved. The Settling Defendants must demonstrate that they have achieved compliance according to the evaluation procedure defined in 40 C.F.R. Section 264.97. Using such procedures, the Settling Defendants shall demonstrate that the Interim Cleanup Levels have not been exceeded for a period of three consecutive years. The Settling Defendants shall submit the results of the demonstration in the DEMONSTRATION OF COMPLIANCE REPORT in accordance with Section VIII.F of this SOW. If EPA, after reasonable opportunity for review and comment by CT DEP, approves the DEMONSTRATION OF COMPLIANCE REPORT and agrees that the Interim Cleanup Levels have been achieved, the Settling Defendants shall perform a risk assessment on the residual groundwater contamination.

The risk assessment of the residual groundwater contamination will assess the cumulative risks for carcinogens and non-carcinogens posed by consumption of Site groundwater. If EPA determines, after reasonable opportunity for review and comment by CT DEP, that the risks are within EPA's risk management standard for carcinogens and non-carcinogens, the residual groundwater concentrations shall constitute the final Cleanup Levels for the Site groundwater and shall be considered Performance Standards for any Remedial Action regarding site groundwater. If EPA determines, after reasonable opportunity for review and comment by CT DEP, that the cumulative risks are not within EPA's risk management standard for carcinogens and non-carcinogens, then EPA will

establish Modified Cleanup Levels, and the Settling Defendants shall continue the Remedial Action until the Modified Cleanup Levels, established by EPA, are achieved, or the remedy is otherwise deemed protective by EPA. These Modified Cleanup Levels shall constitute the final Cleanup Levels for the Site groundwater and shall be considered Performance Standards for any Remedial Action regarding site groundwater.

All Interim Cleanup Levels identified in Table L-1 of the ROD, ARARs and newly-promulgated ARARs and modified ARARs which call into question the protectiveness of the remedy and the protective levels determined as a consequence of the risk assessment of residual contamination, must be met at the completion of the Remedial Action at the point of compliance. Because waste is left in place, the point of compliance for groundwater is to the edge of the waste management unit. Groundwater Cleanup Levels shall be met throughout the contaminated groundwater plume (except for under the cap) including throughout the Severed Plume.

## 2. Soil and Wetland Soil

Cleanup Levels for contamination in soil and wetland soil are specified by EPA in Table L-2 of the ROD and are included in Attachment A of this SOW. Cleanup Levels must be met at the completion of the Remedial Action for soil beyond the extent of the cap in the Operations Area and along the Railroad Right-of-Way, and, in soil and wetland soil on the Cianci property (shown in Figure 7 of the ROD and included in Attachment A of this SOW), after excavation of hotspots. The depths to which these Soil and Wetland Soil Cleanup Levels apply will be in accordance with CT regulations which specify that DEC apply from the ground surface down to a depth of 15 feet below the surface unless the soil is inaccessible as defined in the CT RSRs (as determined by EPA after reasonable opportunity for review and comment by CT DEP). PMC apply from the ground surface down to the low water table with exceptions that restrict PMCs down to high water table as noted in the CT RSRs.

## 3. Updated Assessments

EPA's new Cancer Guidelines and Supplemental Guidelines (March 2005) shall be used as the basis for EPA's analysis of all new carcinogenicity risk assessments. If updated carcinogenicity risk assessments become available, EPA will determine whether an evaluation should be conducted by the Settling Defendants as part of the Remedial Design to assess whether adjustments to the cleanup levels for this Remedial Action are needed in order for this remedy to remain protective of human health. If EPA determines that adjustments to the cleanup levels are needed, these adjusted cleanup levels shall become Performance Standards for the Remedial Action.

#### 4. Overburden NAPL Area

VOC contamination in the overburden shall be reduced to levels that are not indicative of the presence of pooled or residual NAPL. Interim NAPL Cleanup Levels in soil have been calculated using site-specific data, where available, and conservative literature values. The Interim NAPL Cleanup Levels shall be met from the ground surface to the top of bedrock throughout the thermal treatment zone, shown generally in Figure 6b of the ROD (and included in Attachment A of this SOW) and as modified with EPA approval during Remedial Design. (Hereafter, the area where Interim NAPL Cleanup Levels shall be met will be referred to as the "Overburden NAPL Area".) A pre-design boring program beyond the northwest corner of the Operations Area may result in an expansion of the treatment zone.

The Interim NAPL Cleanup Levels are as follows:

Trichloroethylene – 222 ppm  
Tetrachloroethylene – 46 ppm  
1,1,1-Trichloroethane – 221 ppm  
Ethylbenzene – 59 ppm  
Toluene – 48 ppm  
p/m-Xylene – 70 ppm  
o-Xylene – 42 ppm

At the time all the Interim NAPL Cleanup Levels are attained in the Overburden NAPL Area, EPA will evaluate whether to continue to operate the in-situ thermal treatment system in areas within the Overburden NAPL Area where EPA determines that appreciable amounts of NAPL contamination continue to be recovered. For this purpose, EPA will only require continued operation of the portions of the in-situ thermal treatment where "appreciable recovery of NAPL contamination" continues to occur.

Regardless of the level of recovery, the maximum amount of time that EPA shall require continued operation of the in-situ thermal treatment system in portions of the Overburden NAPL Area where appreciable recovery of NAPL contamination continues to occur, after all the Interim NAPL Cleanup Standards are achieved, shall not exceed the initial heating time required to achieve Interim NAPL Cleanup Levels (e.g., if it takes 180 days of heating to achieve all the Interim NAPL Cleanup Levels, the maximum amount of time that EPA will require that any or all wells be operated will be an additional 180 days). The start date for measuring the duration of such period of additional operation, if any, will be the first day of operation after the collection of the last sample within the data set used to successfully demonstrate that all Interim NAPL Cleanup Levels have been attained at every location.

5. NAPL Outside the Overburden NAPL Area

VOC contamination in the bedrock and those portions of the overburden not treated with in-situ thermal remediation shall be treated using monitored natural attenuation and shall be reduced to levels such that the cleanup levels for groundwater (section IV.A.1) are attained. Design and operation of the in-situ thermal treatment system shall be conducted so as to minimize expansion of the groundwater plume at the Site due to further NAPL migration.

B. Additional Performance Standards

1. Multi-layer Cap

The cap shall be a low-permeability, multi-layer RCRA Subtitle C cap. It shall be designed, constructed and maintained to meet the requirements of the CT RSRs (as determined by EPA) for an “engineered control” and shall have a permeability of less than  $1 \times 10^{-6}$  cm/sec. The cap shall also be designed and constructed so as to be consistent with *Final Covers on Hazardous Waste Landfills and Surface Impoundments* (EPA/530-SW-89-047) and *Technical Memorandum: Revised Landfill Cap Design Guidance Proposed for Unlined Hazardous Waste Landfills in EPA Region I* (February 5, 2001). A vapor control system shall be a component of the cap, if EPA determines such a system is necessary as a result of pre-design studies. The basis for a determination that a vapor control system shall be required will include, but shall not be limited to, a demonstration that vapors are likely to migrate beyond the cap and be released at sufficient concentrations to pose an unacceptable risk. No side slope will be graded more steeply than three horizontal to one vertical (3:1).

Portions of the Operations Area and Railroad Right-of-Way shall be filled with sub-base material and graded to provide positive drainage of surface water runoff from the new cap toward new drainage collection systems. Stormwater runoff from the capped areas that is discharged to the Quinnipiac River shall be managed in a manner that is consistent with ARARs. Cap design shall be consistent with the expected future land use of the Railroad Right-of-Way as a public bike path.

2. Hydraulic Containment and Treatment (Including Contingent Remedy)

Groundwater in the overburden and bedrock aquifers that contains Site-related contaminants shall continue to be captured and treated on site using the NTCRA 1/2 Groundwater System, unless and until it is modified pursuant to Sections V.B.6, V.C.4, V.C.6 or VIII.E of this SOW, or as required by EPA to meet the performance standards for the Severed Plume. The performance standards for the NTCRA 1/2 Groundwater System, set forth in Attachment B, shall be met at all times following lodging of the Consent Decree, unless and until they are modified

consistent with modifications under Sections V.B.6, V.C.4, V.C.6 or VIII.E of this SOW, or as required by EPA to meet the performance standards for the Severed Plume. Treated water that meets appropriate discharge requirements shall be discharged to the Quinnipiac River.

The size and shape of the groundwater plume that requires containment is expected to change over time. The selected remedy allows for modifications or enhancements to the extraction and/or treatment system to increase effectiveness, decrease the costs or time of operation, and/or prevent groundwater that exceeds federal and state drinking water standards and other risk-based levels from reaching municipal water supplies in the event that the SWD activates production wells in the Curtiss Street Well Field. Modifications or enhancements may include, but are not limited to, redistribution of containment wells; installation of additional containment wells; changes to the on-site groundwater treatment system; and replacement of the groundwater treatment system (e.g., constructed treatment wetland). All modifications shall be conducted by the Settling Defendants in a protective, ARAR-compliant, effective, and cost-effective manner, as determined by EPA.

Hydraulic containment and treatment shall continue until the Settling Defendants can demonstrate that federal and state drinking water standards have been achieved throughout the groundwater plume (except for under the cap) in the overburden and bedrock aquifers and that the risks are within EPA's risk management standard for carcinogens and non-carcinogens, as shown by a human-health risk assessment.

### 3. Severed Plume

In addition to meeting the performance standard for groundwater in Section IV.A.1 of this SOW, federal and state drinking water standards shall be met throughout the Severed Plume at all times following the lodging of the Consent Decree. Also, the quality of the groundwater in the Severed Plume, which has shown a trend of decreasing contamination levels since the pre-ROD construction of the NTCRA 1 and NTCRA 2 Groundwater Extraction and Treatment System, shall not be adversely impacted by changes in Site conditions, decline in equipment performance and/or moving the hydraulic containment and treatment system.

In the event that the SWD activates production wells in the Curtiss Street Well Field, the risks in the Severed Plume beyond the supplemental containment system shall be within EPA's risk management standard for carcinogens and non-carcinogens, as shown by a human-health risk assessment.

#### 4. Habitat Restoration

The areas disturbed during implementation of the remedy shall be restored to their original functions and values. Disturbed areas include excavation sites on the Cianci property and the culvert outfall, and, access areas and roads, staging/handling areas, etc. that will be constructed during implementation of the remedy.

Cap and cover materials shall be selected and applied so as to provide a suitable substrate for plant species, as appropriate for the area being capped and/or restored. Vegetative cover of the disturbed areas shall be established within one year of remediation in that area. After three growing seasons, the restored areas shall demonstrate a 70% rate of successful establishment of 80% of the planted species. After five growing seasons, a stable vegetative community shall be demonstrated in the disturbed areas.

#### 5. Environmental Monitoring

An environmental monitoring program shall be implemented to evaluate the performance of the groundwater containment and treatment system and the overall effectiveness of the remedy including the MNA component. Performance monitoring throughout the plume in three dimensions shall be conducted to ensure the proper operation of the remedy and to satisfy CT RSR monitoring requirements. Performance monitoring shall include periodic monitoring, and necessary maintenance, of the capped areas and groundwater treatment system influent and effluent. At a minimum, the groundwater monitoring program shall include the following components:

- a. A network of monitoring wells sufficient to monitor changes in contaminant concentrations, plume size and shape, and the effectiveness of natural attenuation processes, in three dimensions, throughout the plume within the overburden and bedrock aquifers. The current network of wells at the Site does not meet this Performance Standard. New monitoring wells shall be installed to fill material data gaps identified during Remedial Design, consistent with Section V.C.1.m. The areas with material data gaps in the overburden and/or bedrock aquifers include: the eastern edge of the plume (east of the Quinnipiac River); the area between the railroad tracks and the NTCRA 1 sheetpile wall; and the powerline right-of-way within the Town Well Field. In addition, new monitoring wells shall be installed if necessary to adequately monitor the plume in the future as site conditions change, as determined by EPA. Any new wells installed within areas where NAPL is known or may be present shall be installed so as to minimize the migration of NAPL.

- b. An initial comprehensive sampling event across the entire plume. This event shall be conducted in the first or second year after lodging of the Consent Decree. Groundwater shall be analyzed for VOCs, alcohols, 1,4-dioxane, TAL metals, PAHs, PCBs, and MNA Parameters. The Settling Defendants may propose that only a portion of these samples be analyzed for MNA Parameters.
- c. Subsequent comprehensive sampling events across the entire plume for five-year reviews. Groundwater shall be analyzed for VOCs, 1,4-dioxane, TAL metals and MNA Parameters. Sampling for five-year reviews shall be conducted in the year prior to the five-year review, with the exception of the first five-year review. Data collected for the initial comprehensive sampling event in Section IV.B.5.a of this SOW can be used for the first five-year review on the condition that the data is no more than two years old. The Settling Defendants may propose that only a portion of these samples be analyzed for MNA Parameters.
- d. In addition to that specified in Sections IV.B.5.a and b of this SOW, sampling of a select subset of monitoring wells in the overburden aquifer in the area between the railroad tracks and the NTCRA 1 sheet pile wall with the following frequency: every other year until the start of in-situ thermal treatment; annually during the performance of in-situ thermal treatment; three times a year after in-situ thermal treatment is complete until equilibrium is restored, as determined by EPA; and annually thereafter. Groundwater shall be analyzed for VOCs and MNA Parameters, except during long-term annual sampling (which begins after equilibrium is restored), when MNA Parameters can be reduced to every other year.
- e. In addition to that specified in Sections IV.B.5.a and b of this SOW, sampling of a select subset of monitoring wells in the bedrock aquifer in the area between the railroad tracks and the NTCRA 1 sheet pile wall with the following frequency: annually before and during the performance of in-situ thermal treatment; three times a year after in-situ thermal treatment is complete until equilibrium is restored, as determined by EPA; and annually thereafter. Groundwater shall be analyzed for VOCs and MNA Parameters, except during long-term annual sampling (which begins after equilibrium is restored), when MNA Parameters can be reduced to every other year.
- f. In addition to that specified in Sections IV.B.5.a and b of this SOW, annual monitoring of VOCs and biennial monitoring of MNA Parameters of a select subset of monitoring wells in the overburden and bedrock aquifers in the area outside the NTCRA 1 sheet pile wall.

- g. Once in-situ thermal treatment is complete and equilibrium is restored, as determined by EPA, Settling Defendants may propose a reduction in frequency of long-term annual monitoring. Any proposal shall be supported by a demonstration that such a reduction is protective and meets the Performance Standards established in this section of the SOW for Environmental Monitoring. Settling Defendants' proposal shall be submitted as part of the Annual State of Compliance Report(s), required in Section VIII.B of this SOW.

#### 6. Institutional Controls

Institutional controls in the form of Environmental Land Use Restrictions pursuant to CT RSRs, or in some other form, shall be implemented in order to prevent uses of the Site that may pose a potential risk to human health (e.g., consumption of contaminated groundwater, exposure to subsurface NAPL, vapor intrusion, exposure to contaminated soil, etc) or may have an adverse impact on the remedy. Once implemented, the institutional controls shall be maintained, monitored and enforced.

### V. REMEDIAL DESIGN

The Remedial Design activities required by this SOW shall include, but are not limited to, the following phases: (a) an initial remedial steps phase; (b) a design initiation phase; (c) a conceptual design phase; and (d) a design completion phase. The Settling Defendants shall submit to EPA and CT DEP the required deliverables as stated herein for each of these Remedial Design activities. Except where expressly stated otherwise in this SOW, each deliverable shall be subject to review and approval or modification by EPA, after reasonable opportunity for review and comment by CT DEP, in accordance with Section XII of the Consent Decree, Submissions Requiring Agency Approval.

More specifically, Remedial Design shall consist of continuation and evaluation of the combined NTCRA 1 and NTCRA 2 Groundwater Extraction and Treatment System; developing and implementing a remedial design workplan; remedial design packages at the conceptual, pre-final and final levels, and technical information meetings with EPA and CT DEP. It may be desirable for remedial design of the three major components (in-situ thermal treatment, excavation and capping, and long-term groundwater containment and treatment) to proceed along separate timelines.

#### A. Continuation of NTCRA 1 and NTCRA 2 Groundwater Extraction and Treatment System

Upon receipt of notice of the lodging of the Consent Decree, the Settling Defendants shall continue to operate and maintain the existing NTCRA 1/2 GROUNDWATER SYSTEM in accordance with all relevant terms, agreements,



reporting requirements, monitoring and workplans as approved and incorporated under Administrative Order on Consent (I-97-1000). Entry of this RD/RA Consent Decree will supersede the NTCRA 1 and 2 Administrative Orders on Consent, and eliminate the Completion of Work and Post-Removal Site Control Plan requirements of the NTCRA SOWs. Upon entry of the RD/RA Consent Decree, the NTCRA 1/2 Groundwater System shall be known as the Hydraulic Containment and Treatment System.

B. Initial Remedial Steps Phase

The INITIAL REMEDIAL STEPS PHASE shall consist of contractor selection as well as the following activities:

1. All work performed by the Settling Defendants pursuant to the Consent Decree shall be carried out under the oversight of a qualified SUPERVISING CONTRACTOR and PROJECT COORDINATOR, the selection of which shall be subject to the disapproval by EPA, after opportunity for review and opportunity CT DEP. Within ten (10) days after lodging of the Consent Decree, the Settling Defendants shall notify EPA and CT DEP in writing of the name, title, and qualifications of the Supervising Contractor and the Project Coordinator they propose to use in carrying out all work required under the Consent Decree. If EPA disapproves the Supervising Contractor or the Project Coordinator, it shall so notify the Settling Defendants.
2. All remedial design work performed by the Settling Defendants pursuant to this Consent Decree shall be carried out under the direction and supervision of one or more qualified REMEDIAL DESIGN CONTRACTOR, the selection of which shall be subject to disapproval by EPA, after opportunity for review and comment by CT DEP. Within ten (10) days after lodging of the Consent Decree, the Settling Defendants shall notify EPA and CT DEP in writing of the name, title, and qualifications of the Remedial Design Contractor they propose to use in carrying out the initial remedial design work required under the Consent Decree. If EPA disapproves the Remedial Design Contractor, it shall so notify the Settling Defendants. The Settling Defendants may engage more than one contractor to prepare remedial design documents. The Settling Defendants shall notify EPA and CT DEP in writing of the name, title, and qualifications of all Remedial Design Contractors they propose to use. If EPA disapproves any Remedial Design Contractor, it shall so notify the Settling Defendants.
3. Within one hundred eighty (180) days after the entry of the Consent Decree, the Settling Defendants shall submit a proposed

MEMORANDUM OF AGREEMENT (MOA), for EPA approval or modification, that serves as a draft agreement between EPA and Southington Water Department (SWD)/Town of Southington, setting forth the timing and procedure through which the SWD/Town of Southington would determine, obtain the necessary CT DEP and CT Department of Public Health approvals for and notify EPA of duly approved municipal plans to reactivate Production Well No. 4 and/or No. 6, or to install or use other water supply wells in the Curtiss Street Well Field.

4. If requested, the Settling Defendants shall participate in meetings with EPA and Southington officials to discuss the MOA. If requested, the Settling Defendants shall be parties to the MOA.
5. Within thirty (30) days of receipt of EPA approval or modification of the proposed MOA described in Section V.B.3 of the SOW, the Settling Defendants shall submit a SUPPLEMENTAL CONTAINMENT ACTION PLAN for EPA review and approval or modification, after reasonable opportunity for review and comment by CT DEP. The action plan shall lay out the steps and schedule that will be taken by the Settling Defendants, upon written notification by SWD/Town of Southington pursuant to the MOA that it plans to reactivate Production Wells No. 4 and/or No. 6, or install or use additional wells in the Curtiss Street Well Field, to prevent only the groundwater plume that exceeds federal and state drinking water standards and other risk-based levels from migrating to such wells. This SUPPLEMENTAL CONTAINMENT ACTION PLAN shall include a monitoring program to ensure that any failure of the containment system is detected well in advance of the plume reaching municipal supply wells. At the time SWD/Town of Southington identifies the location(s) and pumping rates of well(s) intended to be activated within the Curtiss Street Well Field, the Settling Defendants shall perform a human-health risk assessment for groundwater to assist in determining the location of supplemental containment, subject to EPA review and approval.
6. Upon notification by EPA, and consistent with the terms of the MOA described in Section V.B.3 of the SOW as executed by EPA and SWD/Town of Southington, the Settling Defendants shall implement the SUPPLEMENTAL CONTAINMENT ACTION PLAN as approved or modified by EPA.
7. Within thirty (30) days of completion of the vapor intrusion study required under Section V.C.1.k of the SOW, the Settling Defendants shall submit an INSTITUTIONAL CONTROL PLAN to EPA for review and approval or modification, after reasonable opportunity for review and comment by CT

DEP. This plan shall present the process by which Environmental Land Use Restrictions (ELURs) that will run with the land will be recorded in the appropriate local land records office, a schedule for attaining ELURs, a plan for the performance of all necessary parcel surveys, and a detailed plan for the long-term monitoring and enforcement and/or support of EPA's and CT DEP's enforcement of institutional controls (including schedule for compliance inspections of parcels, compliance interviews with property owners, and compliance reporting to EPA). It shall also include plans to perform remedial measures (e.g., install vapor barriers and/or ventilation systems, and finance the cost of operating such systems), if necessary, to address Site-related vapor intrusion issues found on individual parcels requiring institutional controls. Upon request by EPA, this plan shall present the process by which other forms of institutional controls are implemented along with or in place of ELURs. At a minimum, the restrictions will prohibit the following activities:

- a. Prohibit activities that could harm the capped areas of the Site.
  - b. Prohibit groundwater use or extraction of all groundwater within the groundwater plume that exceeds federal drinking water standards, risk-based levels or CT Groundwater Protection Criteria (Appendix C in the CT RSRs).
  - c. Prohibit excavation and other activities that might result in exposure to subsurface soil and wetland soil that exceeds Cleanup Levels in Section IV.A.2 of the SOW, and untreated NAPL and NAPL-contaminated materials in the overburden and bedrock aquifers.
  - d. Prohibit construction above the groundwater plume that exceeds the State's proposed volatilization criteria, unless construction is designed to prevent vapor intrusion consistent with State requirements.
  - e. Otherwise impose such restrictions necessary to protect human health and the environment and maintain the integrity of the remedy.
8. Within ten (10) days of receipt of EPA's approval or modification of the INSTITUTIONAL CONTROL PLAN, the Settling Defendants shall begin to implement the plan.

C. Design Initiation Phase

The Design Initiation Phase shall consist of developing a REMEDIAL DESIGN WORKPLAN and REMEDIAL DESIGN PROJECT OPERATIONS PLAN (POP) including any investigations necessary for developing the design.

Within one hundred twenty (120) days of receipt of EPA's written notice of authorization to proceed following notification of the name, title, and qualifications of the initial Remedial Design Contractor, the Settling Defendants shall submit a REMEDIAL DESIGN WORKPLAN and REMEDIAL DESIGN POP for review and approval or modification by EPA, after reasonable opportunity for review and comment by CT DEP. The REMEDIAL DESIGN WORKPLAN shall provide at a minimum, the following items:

1. detailed descriptions of all activities to be undertaken in connection with any investigations necessary for the design and implementation of the Remedial Action. The detailed descriptions shall contain a statement of purpose and objectives of the investigation, identification of the specific activities necessary to complete the investigation, and a detailed schedule for performance of the investigation. The REMEDIAL DESIGN WORKPLAN shall be consistent with Section VI of the Consent Decree (Performance of Work by Settling Defendants), and Section L of the ROD (Selected Remedy), this SOW, and EPA guidances *Superfund Remedial Design and Remedial Action Guidance* (OSWER Directive 9355.0-4A, June 1986) *Remedial Design/Remedial Action Handbook* (OSWER Directive 9355.0-04B, June 1995). The REMEDIAL DESIGN WORKPLAN shall also describe in detail the following pre-design activities to be undertaken during the Remedial Design Phase:
  - a. A boring program to delineate the extent of the Overburden NAPL Area (i.e., the NAPL treatment area) beyond the northwestern corner of the SRSNE facility.
  - b. A monitoring plan to be performed during implementation of thermal treatment. This plan shall include redundant safe-guards and monitoring at the Site's perimeter to minimize the potential impacts to on-site workers and the community in the unlikely event that unacceptable levels of air emissions are released during thermal treatment. This plan shall also include a community outreach component that provides neighboring residents and businesses with the information they need to recognize and respond to a release.
  - c. A comprehensive set of criteria shall be developed to evaluate the performance of the situ thermal technology during and after implementation.
  - d. An evaluation of vapor treatment needs and options, including bench-scale testing, if necessary.
  - e. An evaluation may be conducted to confirm design specifications to achieve NAPL performance standards, evaluate methods to control

groundwater migration into the treatment zone, confirm vapor treatment equipment sizing, and evaluate the potential for equipment corrosion.

- f. A plan shall be prepared that identifies measures to be taken to address potential downward mobilization of DNAPL, minimize the potential for vapor releases, and identify safety measures to be put in place during implementation of in-situ thermal treatment.
- g. A sampling plan for testing the walls of excavations to ensure that all material exceeding soil and wetland soil cleanup levels has been removed.
- h. A habitat restoration plan to restore the functions and values of the various habitats affected by the remediation. This shall include (1) a study to determine the current functions and values of the areas to be affected by the remediation, and (2) an evaluation of actions to minimize impacts to the wetlands and floodplains, to the extent practicable. The plan will also include reporting requirements to demonstrate compliance with Performance Standards.
- i. A soil investigation to be conducted after implementation of the in-situ thermal component to re-assess the size of the area to be capped. This will include sampling to determine background concentrations for dioxin. To be considered during this re-assessment are any changes to cleanup levels or guidance documents for the contaminants detected (e.g., dioxin, PCBs).
- j. An evaluation to be conducted after implementation of the in-situ thermal component evaluation to determine whether (or not) a vapor control system is needed below the cap. If EPA determines that a vapor control system is needed, such a system shall be included in the design of the multi-layer cap.
- k. A study to (1) determine whether vapor intrusion risks ( $10^{-4}$  to  $10^{-6}$ ) are present at the Site consistent with current screening analysis, and (2) more precisely define the eastern extent of the plume in the overburden aquifer to determine which parcels and locations exceed federal risk levels and therefore require institutional controls and/or remedial measures to prevent vapor intrusion.

In addition to the requirements in the ROD, the Settling Defendants and CT DEP agree that the Settling Defendants shall delineate the extent of the shallow groundwater plume in the overburden aquifer that exceeds applicable CT RSR residential or industrial/commercial volatilization

criteria (the “Shallow Groundwater Plume”). The Settling Defendants and CT DEP further agree that the Settling Defendants shall implement institutional controls and/or remedial measures to prevent Site-related vapor intrusion on all areas within the Shallow Groundwater Plume.

- l. Further develop a site-specific conceptual model for MNA, based on the conceptual model and other information developed during the Remedial Investigation and Feasibility Study (RI/FS) that was the basis for selection of MNA, and incorporating all new data collected since the RI/FS.
  - m. An evaluation of the existing network of groundwater monitoring wells shall be conducted for the following purposes: identification of wells for possible abandonment; identification of existing wells for inclusion in the groundwater monitoring network specified in Section IV.B.5; identification of material gaps in the existing groundwater monitoring network; and proposed locations for new monitoring wells needed in order to meet the performance standard for the groundwater monitoring program specified in Section IV.B.5.
2. REMEDIAL DESIGN POP which shall be prepared in support of all fieldwork to be conducted according to the REMEDIAL DESIGN WORKPLAN, and which shall be prepared in accordance with Attachment C, and will include, but not be limited to, the following:
- a. Site Management Plan;
  - b. Schedule for implementation and reporting;
  - c. Sampling and Analysis Plan which includes a Quality Assurance Project Plan and Field Sampling Plan;
  - d. Site-specific Health and Safety Plan; and
  - e. Community Relations Support Plan.
3. The Settling Defendants may propose, with the approval of EPA, to have the REMEDIAL DESIGN WORKPLAN and REMEDIAL DESIGN POP for the three major components (in-situ thermal treatment, excavation and capping, and post-thermal groundwater containment and treatment) proceed along separate timelines. In that case, the Settling Defendants will include in their first REMEDIAL DESIGN WORKPLAN a schedule for all subsequent design deliverables, for review and approval or modification by EPA, after reasonable opportunity for review and comment by CT DEP. In any event, EPA, at its

discretion, may perform its review of the workplan and POP for each major component under separate timelines.

4. A GROUNDWATER CONTAINMENT AND TREATMENT EVALUATION AND OPTIMIZATION STUDY of the Hydraulic Containment and Treatment System shall be performed by the Settling Defendants upon completion of the in-situ thermal treatment and capping components of the remedy. The EVALUATION AND OPTIMIZATION STUDY is subject to EPA review and approval or modification, after reasonable opportunity for review and comment by CT DEP. The purpose of the study is to:
  - a. Demonstrate that the performance standards in Section IV.B.3 for the Hydraulic Containment and Treatment System and the Severed Plume are being met.
  - b. If the performance standards for the Hydraulic Containment and Treatment System or Severed Plume are not met, the Settling Defendants shall propose modifications and/or enhancements to the Hydraulic Containment and Treatment System necessary to achieve compliance. The Settling Defendants shall also assess whether additional modifications or enhancements to the Hydraulic Containment and Treatment System will increase effectiveness and/or decrease the costs or time of operation. Any and all modifications or enhancements shall be conducted in a protective, ARARs-compliant, effective and cost-effective manner, as determined by EPA.
  - c. Evaluate the protectiveness of the demonstration of compliance requirements set forth in Attachment B of this SOW, as modified. If EPA makes the determination that the demonstration of compliance requirements are no longer protective, the Settling Defendants shall propose new demonstration of compliance requirements.
5. The Settling Defendants shall incorporate any modifications or enhancements to the Hydraulic Containment and Treatment System and/or the demonstration of compliance requirements recommended by the EPA approved or modified EVALUATION AND OPTIMIZATION STUDY in Section V.C.4 into the remedial design steps (Sections V.D and V.E).
6. As directed by EPA, or proposed by the Settling Defendants, the Settling Defendants shall conduct additional OPTIMIZATION STUDIES as specified in V.C.4b – c no less frequently than every ten years.

D. Conceptual Design Phase

The CONCEPTUAL DESIGN PHASE shall consist of pre-design investigations outlined above in Section V.C.1 and the 30% conceptual design.

1. Within one hundred and twenty (120) days of receiving EPA approval that necessary pre-design investigations described in the Remedial Design Workplan(s) and Remedial Design POP(s) are complete, the Settling Defendants shall submit to EPA for review and approval, with reasonable opportunity for review and comment by CT DEP, a CONCEPTUAL DESIGN PACKAGE at the 30% design stage to include, at a minimum, the following:
  - a. report presenting results of pre-design activities;
  - b. basis of design/assumptions;
  - c. 30% plans, drawings, sketches, calculations, and technical specifications as defined in the Remedial Design Workplan;
  - d. project delivery strategy;
  - e. draft statement of regulatory compliance with the applicable and relevant and appropriate requirements identified in Appendix D of the ROD (the "ARARs");
  - g. draft construction environmental monitoring plan; and
  - h. initial draft Remedial Action ("RA") Workplan and Revised POP for implementing the Remedial Action and associated activities, consistent with the approved Remedial Design for the Site. The Draft RA Workplan shall include, at a minimum, those items specified in Section VI.A. The Revised POP shall be prepared in accordance with Section V.C.2.
  - i. As part of the Conceptual Design Package, the Settling Defendants shall also notify EPA and CT DEP in writing of the names, titles and qualifications of the INDEPENDENT QUALITY ASSURANCE TEAM (IQAT). The functions and responsibilities of the IQAT, with respect to design and construction shall include, at a minimum, the following:
    - (1) review design criteria, plans, and specifications for clarity and completeness;



- (2) train Construction Quality Assurance (CQA) inspection personnel on project QA requirements and procedures;
  - (3) schedule and coordinate CQA inspections;
  - (4) verify that the Quality Control (QC) plan for construction activities is implemented in accordance with the site-specific QA plan for these construction activities;
  - (5) perform periodic independent on-site inspections of the Work as needed to assess compliance with the approved design criteria, plans and specifications; and
  - (6) report results of all inspections, including findings that the Work is not acceptable quality or fails to meet the specified design requirements to the Settling Defendants, EPA and CT DEP.
2. The Conceptual Design for the IN-SITU THERMAL component of the remedy shall include a sampling program to determine whether Overburden NAPL Cleanup Levels have been attained.
  3. In accordance with the schedule set forth in the EPA-approved RD Workplan(s), the Settling Defendants shall hold at least one TECHNICAL INFORMATION MEETING with EPA and CT DEP to discuss the conceptual design. The Settling Defendants shall present and discuss, at a minimum, the components of the Conceptual Design Package listed above in Section V.D.1. Subsequent to this meeting, the Settling Defendants shall prepare meeting minutes and submit their responses to all EPA and CT DEP comments in a written letter.

E. Design Completion Phase

The DESIGN COMPLETION PHASE shall consist of the 95% pre-final design and 100% final design packages. The details of these items, including a schedule for submittal, are described below.

1. Within ninety (90) days of receiving EPA's approval or modification of the Conceptual Design Package(s), the Settling Defendants shall submit to EPA for review and approval, with reasonable opportunity for review and comment by CT DEP, a PRE-FINAL DESIGN PACKAGE(s) at the 95% design stage to include, at a minimum, the following:

- a. all revisions required by EPA based upon EPA and CT DEP comments provided at the technical information meeting(s);
  - b. basis of design/assumptions, noting any changes;
  - c. 95% plans, drawings, sketches, calculations, and technical specifications, noting any changes (the specific plans, drawings, sketches, calculations, and technical specifications will be identified in the RD Workplan);
  - d. final draft RA Workplan and Revised POP;
  - e. final draft regulatory compliance statement;
  - f. final bid documents, as requested;
  - g. final draft construction environmental monitoring plan;
  - h. status of procurements including a list of pre-qualified Remedial Action Contractors, Construction Managers, principal contractors and/or subcontractors with a summary of experiences and qualifications from whom the Settling Defendants may solicit bids to perform the Remedial Action work set forth herein. EPA, after reasonable opportunity for review and comment by CT DEP, may disapprove of any of the proposed bidders; and
  - i. Draft Operation and Maintenance (“O&M”) Plan. The O&M plan(s) shall include detailed procedures, inspection schedules, and review of financial assurance mechanisms to ensure the safe and effective implementation of the multi-layer cap, restored habitat, and continued effectiveness of the groundwater containment, extraction, treatment and discharge system. The Draft O&M Plan shall include, at a minimum, those items specified in Section VI.I.
2. In accordance with the schedule set forth in the EPA-approved RD Workplan(s), the Settling Defendants shall hold at least one TECHNICAL INFORMATION MEETING with EPA and CT DEP to discuss the pre-final design. The Settling Defendants shall present and discuss, at a minimum, the components of the Pre-final Design Package listed above in Section V.E. Subsequent to this meeting, the Settling Defendants shall prepare meeting minutes and submit their responses to all EPA and CT DEP comments in a written letter.

3. Within forty-five (45) days of receiving EPA's approval or modification of the Pre-final Design Package(s), the Settling Defendants shall submit to EPA for review and approval, with reasonable opportunity for review and comment by CT DEP, a FINAL DESIGN PACKAGE(s) at the 100% design stage to include, at a minimum, the following:
  - a. all revisions required by EPA based upon EPA and CT DEP comments provided at the pre-final technical information meeting(s);
  - b. basis of design/assumptions, noting any changes;
  - c. 100% plans, drawings, sketches, calculations, and technical specifications, noting any changes;
  - d. updated draft RA Workplan and Revised POP;
  - e. final regulatory compliance statement;
  - f. final construction environmental monitoring plan;
  - g. a correlation of the design plans and specifications;
  - h. a Contingency Plan that shall address the on-site construction workers and the local affected population in the event of an accident or emergency;
  - i. a Constructability Review Report that evaluates the suitability of the project and its components in relation to the Site; and
  - j. final O&M plan.

## VI. REMEDIAL ACTION

The Remedial Action activities required for the SRSNE Site shall include, but are not limited to: (a) REMEDIAL ACTION WORKPLAN and REMEDIAL ACTION POP; (b) pre-construction conference; (c) initiation of construction; (d) implementation schedule; (e) meetings during construction; (f) environmental monitoring; (g) construction completion inspections and reports; and (h) operation and maintenance. The Settling Defendants shall submit to EPA and the State the required deliverables as stated herein for each of these Remedial Action activities. Each deliverable shall be subject to review and approval or modification by EPA, after reasonable opportunity for review and comment by CT DEP, in accordance with Section XII of the Consent Decree, Submissions Requiring Agency Approval.

A. Remedial Action Work Plan(s) and Revised POP(s)

In the event that the selected Remedial Action Contractor identifies modifications to the draft Remedial Action Work Plan and Revised POP that are necessary to reflect specific means and methods to be used to implement the Work, within one hundred and twenty (120) days of receiving EPA's approval or modification of the FINAL Remedial Design, the Settling Defendants shall submit to EPA for review and approval, after reasonable opportunity for review and comment by CT DEP, an updated Final DRAFT REMEDIAL ACTION WORKPLAN(s) and REVISED POP(s). The REMEDIAL ACTION WORKPLAN and REVISED POP shall contain, at a minimum:

1. Description of all activities necessary to implement all components of the Remedial Action, in accordance with the Remedial Design, the SOW, the Consent Decree and the ROD, including but not limited to the following:
  - a. award of project contracts, including all agreements with off-site treatment and/or disposal facilities;
  - b. contractor mobilization/Site preparation, including construction of necessary utility hookups;
  - c. construction, shake-down, and start-up of the in-situ thermal treatment technology; and
  - d. demobilization of all treatment facilities.
2. Detailed schedule for the completion of all activities identified in Section VI.A.1, including the required deliverables, and an identification of milestone events in the performance of the Remedial Action.
3. REVISED POP(s) shall be prepared in support of all fieldwork to be conducted according to the REMEDIAL DESIGN WORKPLAN(s). This REVISED POP(s) shall be prepared in accordance with Section V.C.2 above.
4. The Settling Defendants shall hold at least one TECHNICAL INFORMATION MEETING with EPA and CT DEP to discuss the draft RA Workplan(s) and Revised POP(s). The Settling Defendants shall present and discuss, at a minimum, the components of the draft RA Workplan(s) and Revised POP(s) listed above in Section VI.A.1-3. Subsequent to this meeting, the Settling Defendants shall prepare meeting minutes and submit their responses to all EPA and CT DEP comments in a written letter.

5. Within sixty (60) days of receiving EPA's approval or modification of the draft RA Workplan(s) and Revised POP(s), the Settling Defendants shall submit to EPA for review and approval, with reasonable opportunity for review and comment by CT DEP, a FINAL REMEDIAL ACTION WORKPLAN(s) and REVISED POP(s).

B. Remedial Action Implementation Schedule

Within thirty (30) days after receipt of EPA approval or modifications of the Final RA Workplan(s), the Settling Defendants shall submit to EPA for review and approval, after reasonable opportunity for review and comment by CT DEP, an IMPLEMENTATION SCHEDULE(s) that shall identify all major milestones for completion of each major component of the Remedial Action including the commencement and completion of construction of each component of the remedy, and for demonstrating compliance with the approved construction plan(s).

C. Pre-construction Conference(s)

Within thirty (30) days of receiving EPA's approval or modification of the Final RA Workplan(s), the Settling Defendants shall hold a PRE-CONSTRUCTION CONFERENCE(s). The participants shall include all parties involved in the Remedial Action, including but not limited to the Settling Defendants and their representatives, EPA, and CT DEP.

D. Pre-construction Public Meeting(s)

Within forty-five (45) days of receiving EPA's approval or modification of the Final RA Workplan(s), the Settling Defendants shall participate in a PRE-CONSTRUCTION PUBLIC MEETING(s). Invitees shall include local law enforcement and emergency personnel, as well as local residents, and may be combined in part or in whole with the Pre-construction Conference(s).

E. Initiation of Construction

Within sixty (60) days of receiving EPA's approval or modification of the Remedial Action Workplan(s) and Revised POP, the Settling Defendants shall INITIATE ALL THE REMEDIAL ACTION ACTIVITIES specified in the schedule(s) contained therein.

F. Meetings during Construction

During the construction period, the Settling Defendants and their construction contractor(s) shall MEET WEEKLY with EPA and CT DEP regarding the progress and details of construction. Conference calls may constitute a meeting. If, during the

construction of the Remedial Action for the Site, conditions warrant modifications of the design, construction, and/or schedules, the Settling Defendants may propose such design or construction or schedule modifications. Following approval by EPA, after reasonable opportunity for review and comment by CT DEP, the Settling Defendants shall implement the design or construction modifications required.

G. Final Construction Inspections

Within sixty (60) days after the Settling Defendants conclude that the construction for each major component (in-situ thermal treatment, excavation and capping, and long-term groundwater containment and treatment) has been fully (100% complete) performed, or in the case of the long-term groundwater containment and treatment system, is fully operational and functional, the Settling Defendants shall schedule and conduct a FINAL CONSTRUCTION INSPECTION(s) for each major component. This inspection shall include participants from all parties involved in the Remedial Action, including but not limited to the Settling Defendants and their contractors, EPA and CT DEP. If after the inspection, EPA determines that, with the exception of minor punch list items, construction is not complete, EPA will notify the Settling Defendants of the deficiencies and a schedule for addressing deficiencies. In that instance, the Settling Defendants shall schedule and conduct additional construction inspections, as necessary.

H. Construction Completion Report(s)

Within thirty (30) days of the Final Construction Inspection for each major component (in-situ thermal treatment, excavation and capping, and long-term groundwater containment and treatment), the Settling Defendants shall submit a CONSTRUCTION COMPLETION REPORT(s) (Preliminary "Close-out" Report) to EPA for approval or modification, after reasonable opportunity for review and comment by CT DEP. The report(s) shall include, at a minimum, the following documentation:

1. Summary of Site conditions and chronology of remedial activities and events;
2. A chronological summary of all construction activities and procedures actually undertaken and materials and equipment used, and results of any and all environmental monitoring conducted during construction;
3. Tabulation of all analytical data and copies of field notes prepared during the course of the Remedial Design and Remedial Action construction activities including, but not limited to:
  - a. QA/QC documentation of these results; and
  - b. presentation of these results in appropriate figures;

4. Summary of the implementation of the construction quality control plan, including reports from the IQAT;
5. A description, with appropriate photographs, maps and tables of the disposition of the Site (including areas and volumes of contaminated soil and wetland soil placement and disturbance), and off-site disposal of hazardous waste;
6. Final, detailed cost breakdowns;
7. Evaluation regarding conformance with ARARs and specified Performance Standards, and, description of actions to be taken and schedule of future actions to be taken to conform with ARARs and specified Performance Standards;
8. Minor inspection/punch list of items remaining to be completed as identified during the Final Construction Inspection;
9. Summary of O&M activities to be implemented for that component of the remedy; and
10. Schedule for completion of additional components, or, completion of the Interim Remedial Action Report (Section VIII.C of the SOW).

I. Operation and Maintenance

Immediately upon receipt of EPA approval or modification of the Construction Completion Report(s), the Settling Defendants shall implement all operation and maintenance activities in accordance with the terms and schedules set forth in the Operation and Maintenance Plan(s), approved by EPA during Remedial Design. The Operation and Maintenance Plan(s) shall include, at a minimum, the following:

1. description of normal operations and maintenance;
2. description of potential operational problems;
3. description of routine process monitoring and analysis;
4. description of contingency operation and monitoring;
5. operational safety plan;
6. description of equipment;
7. annual operation and maintenance budget;

8. recordkeeping and reporting requirements;
9. monitoring well inspection, maintenance, and, if appropriate, abandonment program; and
10. site closure and post-closure activities, including:
  - a. cost estimates for post-closure care consistent with 40 C.F.R. Part 264;
  - b. review of financial assurance mechanism for post-closure care consistent with 40 C.F.R. Part 264; and
  - c. post-closure inspection schedule and provisions for implementing such activities consistent with 40 C.F.R. Part 264.

## VII. COMPLIANCE MONITORING

The Compliance Monitoring activities required for the SRSNE Site shall include, but are not limited to (a) monitoring natural attenuation and (b) compliance monitoring to demonstrate site-wide compliance with all Performance Standards not previously addressed in this SOW. Environmental monitoring during construction and implementation of the in-situ thermal technology; excavation, capping and habitat restoration, and modifications to the groundwater containment and treatment system is incorporated in RD and RA Workplan(s).

### A. Monitored Natural Attenuation (MNA)

1. As part of the Remedial Design Work Plan, the Settling Defendants shall submit a MONITORED NATURAL ATTENUATION PLAN for EPA review and approval or modification, after reasonable opportunity for review and comment by CT DEP. The plan shall include all monitoring and analysis necessary to complete the delineation of the groundwater plume(s) in three dimensions; evaluate the effectiveness of institutional controls; assess temporal and spatial variations in plume chemistry and geometry; and assess progress in meeting the long-term remedial goal of groundwater restoration throughout the Site to its natural quality. All necessary information to implement the plan shall be incorporated into the Remedial Design Workplan POP prepared in accordance with Section V.C.2. The plan shall be developed in accordance with EPA guidance *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites* (OSWER Directive 9200.4-17P, April 1999) and *Performance of Monitoring of MNA Remedies for VOCs in Ground Water* (EPA/600/R-04/027, April 2004) (collectively "EPA's MNA Guidance") and shall include the following:



- a. a detailed description of how field data will be interpreted and presented in subsequent annual monitoring reports including, but not limited to, statistical methods, iso-concentration contour plots, and groundwater potentiometric surface maps;
  - b. a well maintenance program which shall contain provisions for inspection, continued maintenance, repair, and prompt and proper abandonment, if necessary; and
  - c. an evaluation of contingency measures if progress in meeting long-term groundwater restoration goals is inadequate, as determined by EPA.
2. Within one hundred twenty (120) days after the Settling Defendants complete the installation of any new monitoring wells provided for or that become necessary to complete the delineation process in the approved Remedial Design Workplan, the Settling Defendants shall submit to EPA and the State the first MONITORED NATURAL ATTENUATION REPORT. The report(s) shall be prepared in accordance with EPA's MNA Guidance. Thereafter, the Settling Defendants shall submit additional MONITORED NATURAL ATTENUATION REPORTS to EPA and CT DEP on an annual basis until approval or modification by EPA, after reasonable opportunity for review and comment by CT DEP, as part of the Annual State of Compliance Reports, as specified in Section VIII.B of this SOW. All MONITORED NATURAL ATTENUATION REPORTS are subject to EPA approval or modification, and will include, at a minimum, the following:
  - a. Background and site description;
  - b. Evaluation of new data and summary of data interpretation;
  - c. Update of the MNA conceptual model;
  - d. Assessment of progress in meeting long-term groundwater restoration goals; and
  - e. Recommendations for action, per Table 5 of EPA's MNA Guidance, to include but not be limited to, changes in monitoring locations and frequencies, sampling methods, etc.
3. At the direction of EPA, but no less frequently than as part of the five-year reviews, the Settling Defendants shall evaluate the MONITORED NATURAL ATTENUATION PLAN to assess progress in meeting the Performance Standards.

## B. Compliance Monitoring

1. Concurrent with submittal of the (first) draft RA Workplan, the Settling Defendants shall submit a COMPLIANCE MONITORING WORKPLAN for EPA review and approval, after reasonable opportunity for review and comment by CT DEP. The COMPLIANCE MONITORING WORKPLAN shall involve monitoring to demonstrate conformance and compliance with all Cleanup Levels and Additional Performance Standards listed in Section IV of this SOW. At a minimum, this plan shall detail how the Settling Defendants will demonstrate that the Cleanup Levels and Additional Performance Standards listed in Section IV of this SOW have been or will be attained at the Site. This plan shall be developed in accordance with the requirements of 40 C.F.R. 264.97 and shall include at a minimum, the following:
  - a. sampling locations and frequencies;
  - b. schedule for work;
  - c. appropriate statistical modeling or other data interpretation techniques; and
  - d. to the extent that modifications to the POP submitted with the Remedial Design Workplan are necessary, a COMPLIANCE MONITORING POP, prepared in accordance with Section V.C.2 of this SOW.
2. Within ten (10) days of receiving EPA's approval or modification of the COMPLIANCE MONITORING WORKPLAN, the Settling Defendants shall implement all compliance monitoring activities in accordance with the terms and approved schedules contained therein.
3. At the direction of EPA, but no less frequently than as part of the five-year reviews, the Settling Defendants shall evaluate the COMPLIANCE MONITORING WORKPLAN to ensure compliance with the Performance Standards.

## VIII. COMPLIANCE REPORTING

In addition to those reports required under Section VII of this SOW, the Compliance Reporting activities required for the SRSNE Site shall include, but not be limited to (a) monthly progress reports; (b) interim remedial action report; (c) five-year reviews; (d) demonstration of compliance report; and (e) summary of costs.

A. Monthly Progress Reports

On the tenth day of the first month beginning after lodging of the Consent Decree and on the tenth day of every month thereafter, the Settling Defendants shall submit progress reports to EPA and CT DEP. The reports shall summarize all activities that have been conducted in the preceding period and those activities planned for the next monthly periods. At a minimum, and in addition to the requirements set forth in the Consent Decree, the reports shall:

1. identify the percent of construction complete;
2. identify any problems encountered and/or changes to the schedule;
3. summarize the results of all sampling and tests conducted and all other data received by the Settling Defendants during that period;
4. summarize the results of any environmental monitoring conducted during construction and/or for compliance with Cleanup Levels and Additional Performance Standards as described in Section IV of the SOW; and
5. include photographs of the relevant Site activities. Photographs shall be labeled with the date, brief description of the activity, weather conditions and direction/orientation of the photograph.

Monthly progress reporting will terminate as of the date of EPA approval of the final Construction Completion Report, which triggers commencement of the Operations and Maintenance period. O&M reporting will occur through submission of Annual State of Compliance Reports.

B. Annual State of Compliance Reports

One year after lodging of the Consent Decree and annually thereafter, the Settling Defendants shall submit to EPA for approval or modification, after reasonable opportunity for review and comment by CT DEP, a STATE OF COMPLIANCE REPORT. These reports shall be a comprehensive evaluation of all monitoring required by this SOW, including, but not limited to, compliance with the Performance Standards for the Hydraulic Containment and Treatment System and the Severed Plume, institutional controls, construction, operation and maintenance, habitat restoration, hydraulic containment, the MOA with SWD/Town of Southington, and groundwater monitoring program, including MNA. These reports shall also include an assessment of the progress being made towards achieving the Performance Standards, as well as recommendations for changes to any monitoring program to address deficiencies identified during the evaluation. The Settling Defendants may also propose reductions in monitoring along with justifications. The outcome of any

groundwater containment and treatment optimization studies shall also be included in these annual reports. Each ANNUAL STATE OF COMPLIANCE REPORT shall include a proposed schedule for submission of any work plans or other activities needed to implement the recommendations in each report. Annual State of Compliance Reports may be consolidated with five-year review reports.

C. Interim Remedial Action Report

Within ninety (90) days of EPA's determination, in writing, that the HYDRAULIC CONTAINMENT AND TREATMENT SYSTEM as specified by Section V.C.4 of the SOW is operational and functional, the Settling Defendants shall prepare an INTERIM REMEDIAL ACTION REPORT for EPA approval or modification, after reasonable opportunity for review and comment by CT DEP. The report shall be prepared in accordance with Exhibit 2-3 in EPA's *Close Out Procedures for National Priorities List Sites* (OSWER Directive 9320.09A-P), dated January 2000, as amended.

D. Five-Year Review Reports

Five years from the date of the Record of Decision (September 2005) and every five years thereafter, the Settling Defendants shall submit a FIVE-YEAR REVIEW REPORT, for EPA approval or modification, after reasonable opportunity to review and comment by CT DEP. These reports shall be prepared in accordance with EPA's *Comprehensive Five-Year Review Guidance* (OSWER 9355.7-03B-P), dated June 2001, as amended or superseded, and shall also include documentation that a reminder has been sent to Southington officials that the MOA described in Section V.B.5 remains in effect.

E. Completion of Groundwater Containment and Treatment

At the completion of the period necessary to demonstrate that there are no exceedances of federal and state drinking water standards and other risk-based levels, the Settling Defendants shall submit to EPA for approval or modification, after reasonable opportunity for review and comment by CT DEP, a DEMONSTRATION OF HYDRAULIC CONTAINMENT AND TREATMENT COMPLETION REPORT. The report must contain all information necessary to demonstrate that federal and state drinking water standards have been achieved throughout the groundwater plume in the overburden and bedrock aquifers and that the risks are within EPA's risk management standard for carcinogens and non-carcinogens, as shown by a human-health risk assessment. The report must also provide an evaluation of the impacts, if any, of discontinuing hydraulic containment on the Monitored Natural Attenuation Plan and quality of the surface water in the Quinnipiac River. The activities that will be taken to decommission the hydraulic containment and treatment system must also be addressed by this report. The Settling Defendants shall continue to maintain and

operate the hydraulic containment and treatment system until EPA, in consultation with CT DEP, approves, in writing, its discontinuation.

F. Determination of Background for Metals in Groundwater

No sooner than 365 days prior to submittal of the Demonstration of Compliance Report (Section VIII.G of the SOW), the Settling Defendants shall submit a DETERMINATION OF BACKGROUND FOR METALS IN GROUNDWATER REPORT. In this report, the Settling Defendants shall propose Interim Cleanup Levels for the metals specified in Table L-1 of the ROD (included in Appendix A of the SOW), ARARs, and newly-promulgated ARARs and modified ARARs which call into question the protectiveness of the remedy. The proposed Interim Cleanup Levels for metals shall be equal to the background concentrations for groundwater of each substance, and shall be subject to EPA approval or modification, after reasonable opportunity for review and comment by CT DEP. Upon approval, these concentrations must be met in accordance with the requirements in Section IV.A.1 of this SOW.

G. Demonstration of Compliance Report

At the completion of the period necessary to demonstrate compliance with the Interim Cleanup Levels throughout the groundwater plume, including the Severed Plume, except for under the cap, the Settling Defendants shall submit to EPA for approval or modification, after reasonable opportunity for review and comment by CT DEP, a DEMONSTRATION OF COMPLIANCE REPORT (or Final Remedial Action Report). The DEMONSTRATION OF COMPLIANCE REPORT shall be prepared in accordance with Exhibit 2-3 in EPA's *Close Out Procedures for National Priorities List Sites* (OSWER Directive 9320.09A-P), dated January 2000, as amended, and shall contain, at a minimum, the following information:

1. all information necessary to demonstrate compliance with the Interim Cleanup Levels in accordance with the requirements of 40 C.F.R. 264.97 and RCSA 22a-133k-3(f) and 22a-133k-3(g) ;
2. all data, collected and tabulated, to support the risk assessment conducted by the Settling Defendants as specified in Section IV.A.1 of the SOW, subject to EPA approval.

H. Summary of Cost and Performance of Remedial Action

At the same time as delivery of the Demonstration of Compliance Report, the Settling Defendants shall submit, under separate cover, a SUMMARY REPORT ON THE COST AND PERFORMANCE OF THE REMEDIAL ACTION for EPA review and approval, after reasonable opportunity for review and comment. This report shall be

prepared in accordance with EPA's *Guide to Documenting Cost and Performance for Remediation Reports* (EPA 542-B-95-002), dated March 1995, as amended or superseded.

IX. SUBMISSIONS REQUIRING AGENCY APPROVAL

- A. All plans, deliverables and reports identified in the SOW for submittal to EPA and CT DEP shall be delivered to EPA and CT DEP in accordance with the Consent Decree and this SOW.
- B. Any plan, deliverable, or report submitted to EPA and CT DEP for approval shall be printed using two-sided printing and marked "Draft" on each page and shall include, in a prominent location in the document, the following disclaimer: "Disclaimer: This document is a DRAFT document prepared by the Settling Defendants under a government Consent Decree. This document has not undergone formal review by the EPA and CT DEP. The opinions, findings, and conclusions, expressed are those of the author and not those of the U.S. Environmental Protection Agency or CT Department of Environmental Protection."
- C. Approval of a plan, deliverable or report does not constitute approval of any model or assumption used by the Settling Defendants in such plan, deliverable or report.

X. SUMMARY OF SOW DELIVERABLES AND ACTIVITIES

Deliverable/Activity	Trigger	Timeframe	SOW Section
Continuation of NTCRA 1/2 Groundwater Containment and Treatment System	Lodging of the Consent Decree (CD).	Immediately upon notice by EPA.	V.A.
Notification of Supervising Contractor, Project Coordinator and Remedial Design (RD) Contractor	Lodging of the CD.	Within 10 days of lodging of the CD.	V.B.1 and V.B.2
Memorandum of Agreement (MOA)	Entry of the CD.	Within 180 days of entry of CD.	V.B.3
Meetings with EPA and Southington officials re: MOA.	Upon EPA's request.	As specified by EPA.	V.B.4
Supplemental Containment Action Plan	EPA approval of the MOA.	Within 30 days of EPA approval of MOA	V.B.5
Initiate Supplemental Containment Action Plan	Upon notification by EPA and consistent with approved MOA.	Upon notification by EPA.	V.B.6
Institutional Control (IC) Plan	Completion of vapor intrusion study.	Within 30 days of completion.	V.B.7

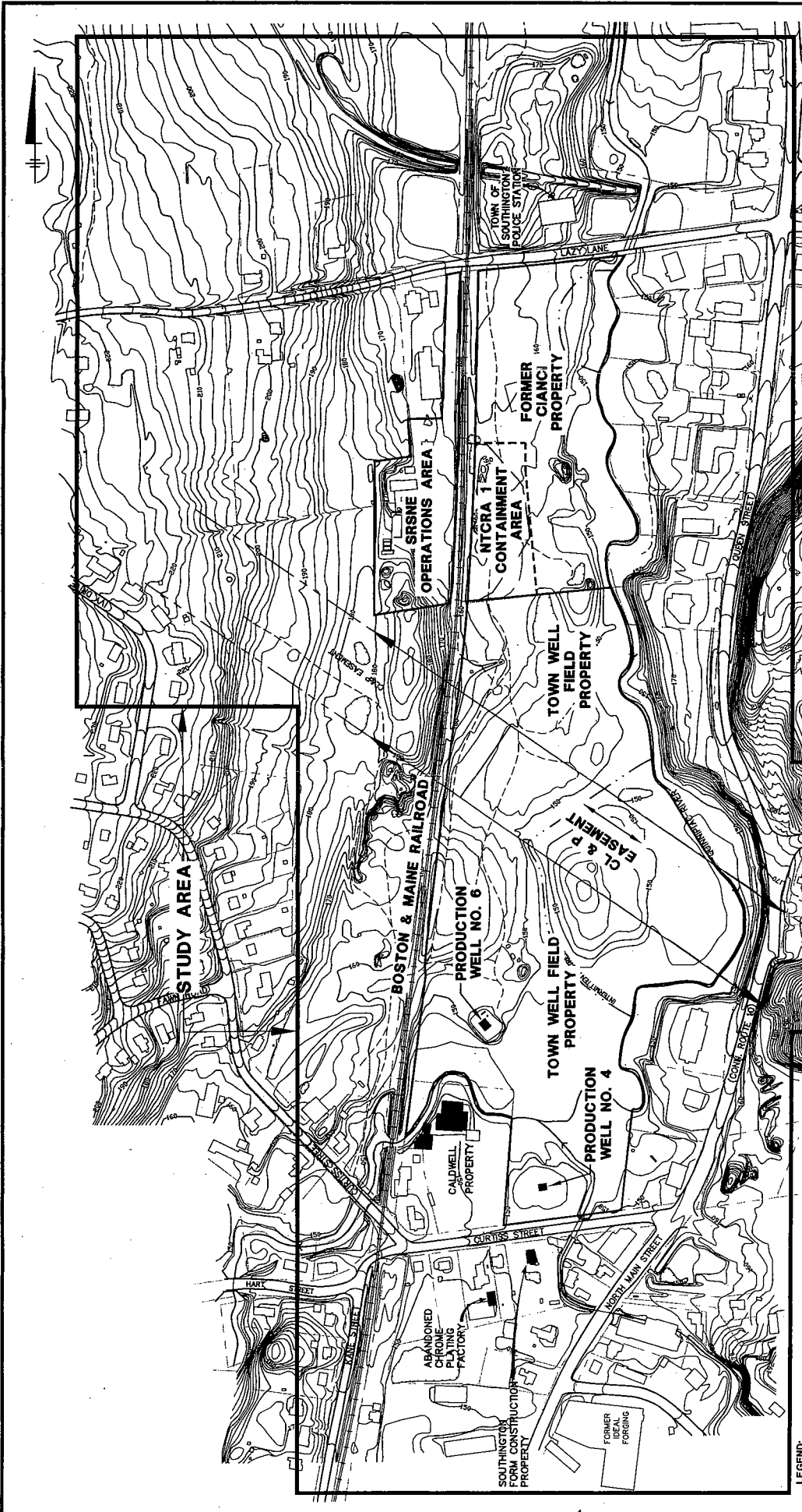
Initiate Implementation of IC Plan	EPA approval or modification of IC Plan.	Within 10 days of EPA approval or modification.	V.B.8
RD Workplan and RD POP	Receipt of EPA's written authorization to proceed following approval of RD Contractor.	Within 120 days of EPA's written authorization to proceed.	V.C.1 and V.C.2
Groundwater Containment and Treatment Evaluation and Optimization Study	Completion of in-situ thermal treatment and capping components of the remedy.	Prior to RD of the long-term groundwater containment, extraction and treatment system.	V.C.4 and V.C. 5
Conduct Additional Optimization Studies	As directed by EPA or proposed by Settling Defendants.	No less frequently than every ten years.	V.C.6
Conceptual Design Package	EPA approval or modification of RD Workplan.	Within 120 days of EPA approval of completion of pre-design studies.	V.D.1
Technical Information Meeting	Submittal of Conceptual Design.	Per approved schedule in RD Workplan.	V.D.3
Pre-final Design Package	EPA approval or modification of Conceptual Design Package(s).	Within 90 days of EPA approval of Conceptual Design.	V.E.1
Technical Information Meeting	Submittal of Pre-final Design Package(s).	Per EPA-approved schedule in RD Workplan.	V.E.2
Final Design Package	EPA approval or modification of Pre-final Design Package(s).	Within 45 days of EPA-approval of the Pre-final Design Package(s).	V.E.3
Remedial Action (RA) Workplan and Revised POP	EPA approval or modification of final Remedial Design, in the event that the selected RA Contractor identifies the need for modifications.	Within 120 days of receiving EPA's approval.	VI.A
RA Implementation Schedule	EPA approval or modification of Final RA Workplan(s).	Within 30 days of receiving EPA's approval of the Final RA Workplan(s).	VI.B

Pre-construction Conference	EPA approval or modification of Final RA Workplan(s).	Within 30 days of receiving EPA's approval of the Final RA Workplan(s).	VI.C
Pre-construction Public Meeting	EPA approval or modification of Final RA Workplan(s).	Within 45 days of receiving EPA's approval of the Final RA Workplan(s).	VI.D
Initiation of Construction	EPA approval or modification of the RA Workplan(s) and Revised POP.	Within 60 days of receiving EPA's approval of the Final RA Workplan(s).	VI.E
Meetings during Construction	EPA approval or modification of Final Design and commencement of construction.	Weekly during the construction period.	VI.F
Final Construction Inspection	Settling Defendants conclude construction complete for each major component.	Within 60 days of notice by Settling Defendants.	VI.G
Construction Completion Report	Final construction inspection.	Within 30 days of inspection.	VI.H
Commencement of Operation and Maintenance	EPA approval or modification of Construction Completion Report(s).	Immediately upon receipt of EPA approval of the Construction Completion Report(s).	VI.I
Monitored Natural Attenuation (MNA) Plan	EPA approval of RD Contractor.	Within 120 days of EPA approval, as part of the RD Workplan.	VII.A.1
MNA Report(s)	EPA approval or modification of MNA Plan.	Within 120 days of new well installation, and annually thereafter until modification to schedule.	VII.A.2
Evaluation of Monitored Natural Attenuation Plan	As directed by EPA.	At the direction of EPA, but no less frequently than as part of the five-year reviews.	VII.A.3
Compliance Monitoring (CM) Workplan	Submission of first RA Workplan.	Concurrent with first RA Workplan.	VII.B.1



Implementation of CM Workplan	EPA approval or modification of CM Workplan.	Initiate activities in approved workplan within 10 days of notice by EPA.	VII.B.2
Evaluation of CM Workplan	As directed by EPA.	At the direction of EPA, but no less frequently than as part of the five-year reviews.	VII.B.3
Monthly Progress Reports	Lodging of the CD.	On the 10 <sup>th</sup> day following lodging and monthly thereafter. Terminates upon EPA approval of final Construction Completion Report.	VIII.A
Annual State of Compliance Reports	One year after lodging of the CD.	One year after lodging of the CD and annually thereafter.	VIII.B
Interim RA Report	EPA determination, in writing, that the groundwater containment and treatment system is operational and functional.	Within 90 days of notice by EPA.	VIII.C
Five-year Review(s)	Five years from the date of the Record of Decision (Sept 2005).	Within five years of the ROD, and every five years thereafter.	VIII.D
Demonstration of Hydraulic Containment and Treatment Completion Report	As provided for in this SOW.	As demonstrated by Settling Defendants.	VIII.E
Determination of Background Metals in Groundwater	Compliance with Interim Cleanup Levels for Groundwater.	No sooner than 365 days prior to submittal of Demonstration of Compliance Report.	VIII.F
Demonstration of Compliance Report	Compliance with cleanup levels.	As demonstrated by Settling Defendants.	VIII.G
Summary of Cost Information	Compliance with cleanup levels.	As demonstrated by Settling Defendants.	VIII.H

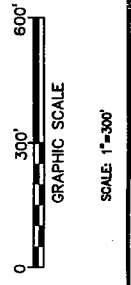
ATTACHMENT A  
FIGURES and TABLES



SRSNE SUPERFUND SITE  
SOUTHINGTON, CONNECTICUT  
FEASIBILITY STUDY

**SRSNE STUDY AREA**

FIGURE  
1



**LEGEND:**

170 GROUND SURFACE INDEX ELEVATION CONTOUR  
(10 FT. CONTOUR INTERVAL)

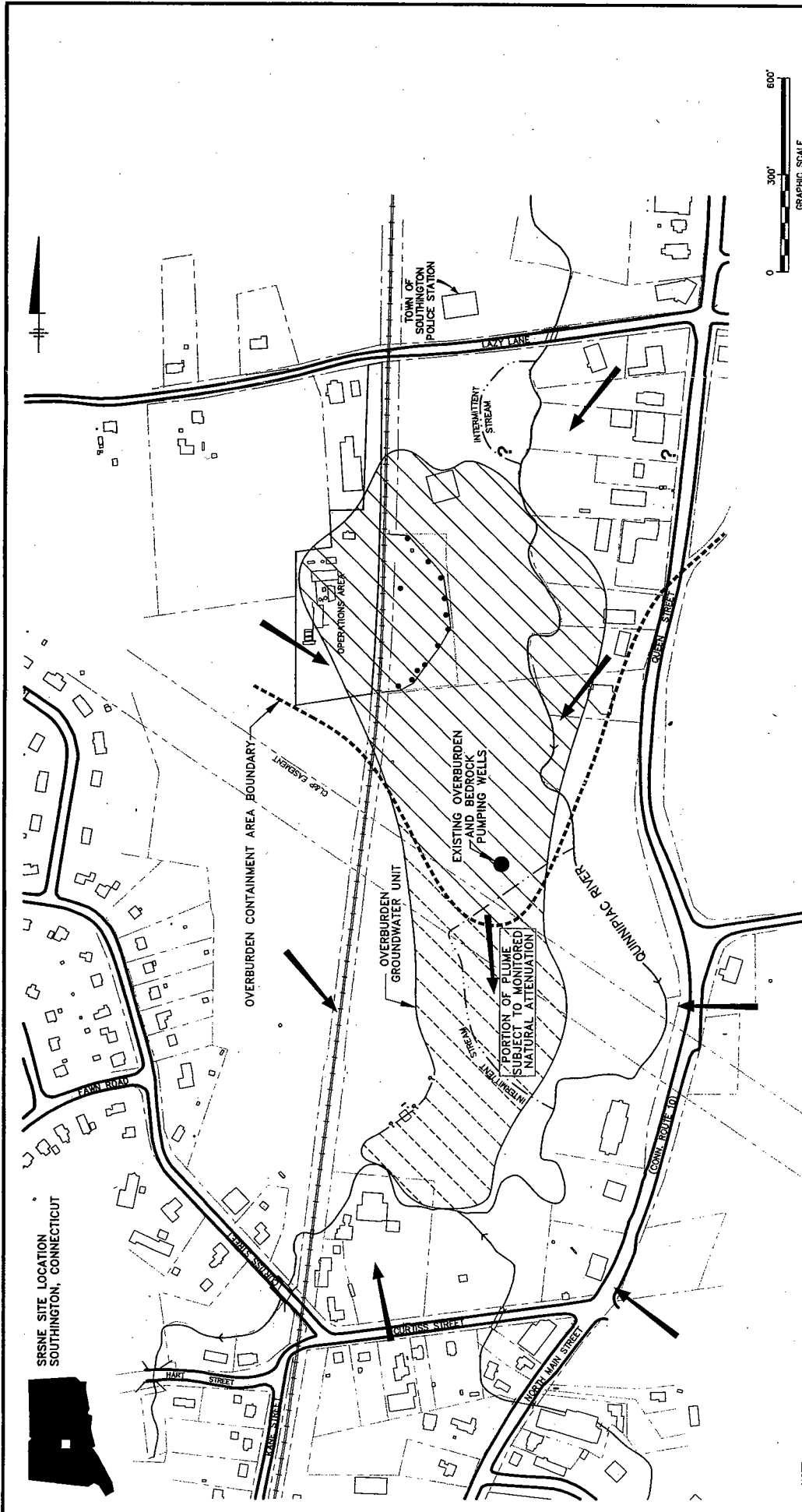
GROUND SURFACE INTERMEDIATE ELEVATION CONTOUR  
(2 FT. CONTOUR INTERVAL)

**NOTE:**

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LACY LANE, SOUTHINGTON, CONNECTICUT DATED 9-28-93 BY UNDERPAC TECHNOLOGIES CORPORATION.

2. CALDWELL AND SOUTHINGTON FORM CONSTRUCTION PROPERTIES AND ABANDONED CONSTRUCTION PROPERTIES DRAWINGS PROVIDED BY WATKINS ENGINEERING, INC., "WATER TABLE MAP", DRAWING NO 28999-02, 1/13/80.

T:\0031\W03\003130\031300\FEAS\FIG1.DWG  
P. FAHSEZ/ANR-BL  
03/31/02\FEASIBILITY\FEAS1303.DWG



**NOTE:**

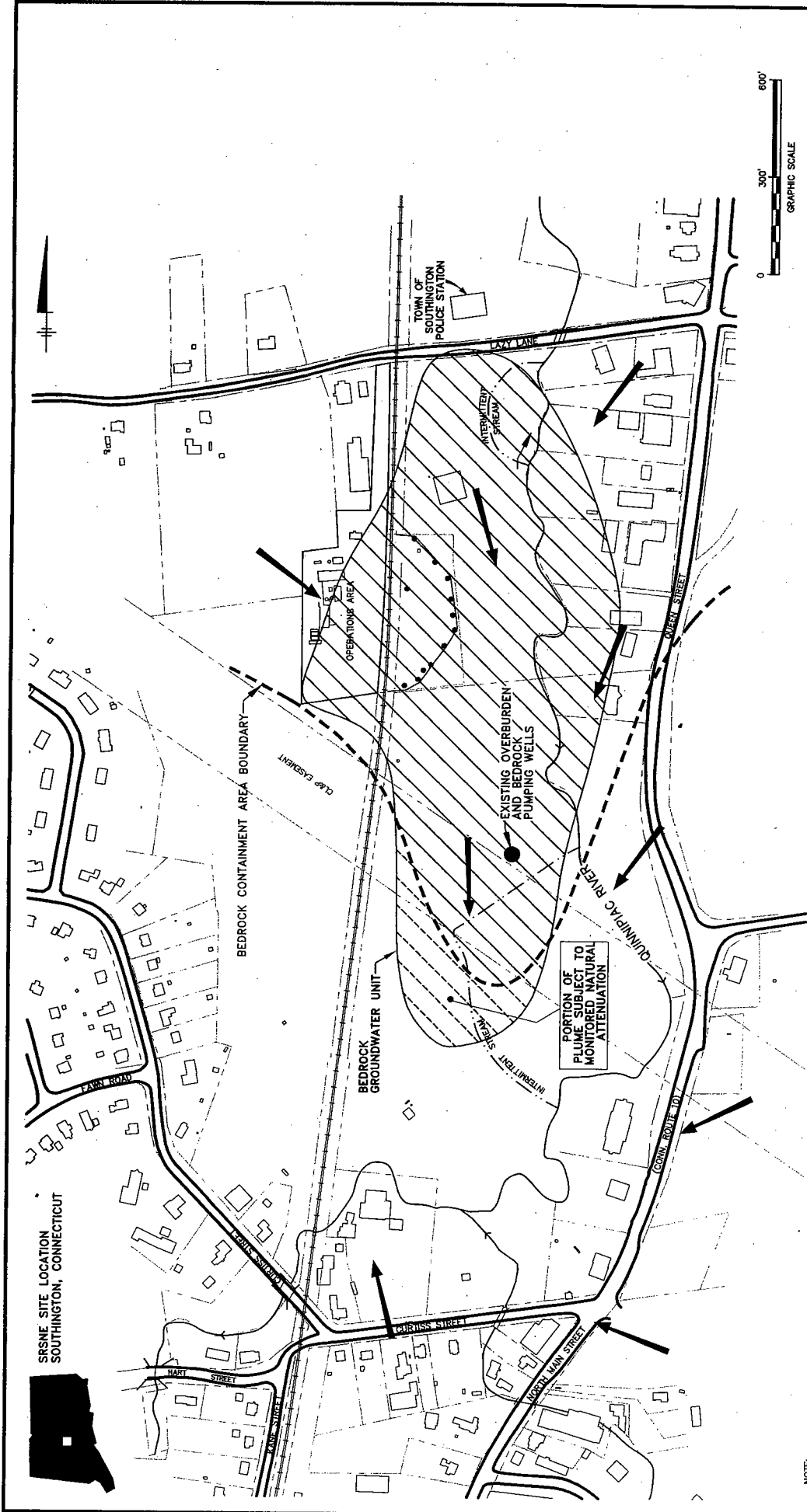
1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY LAZY LANE SOUTHWINGTON, CONNECTICUT DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

**LEGEND:**

- OVERBURDEN SHEET PILE WALL
- OVERBURDEN EXTRACTION WELL (12)
- GENERALIZED GROUND-WATER FLOW DIRECTIONS

SRSNE SUPERFUND SITE  
SOUTHWINGTON, CONNECTICUT  
FEASIBILITY STUDY

**OVERBURDEN GROUNDWATER AREA**



SRSNE SUPERFUND SITE  
SOUTHWINGTON, CONNECTICUT  
FEASIBILITY STUDY

**BEDROCK GROUNDWATER AREA**

FIGURE  
**5**

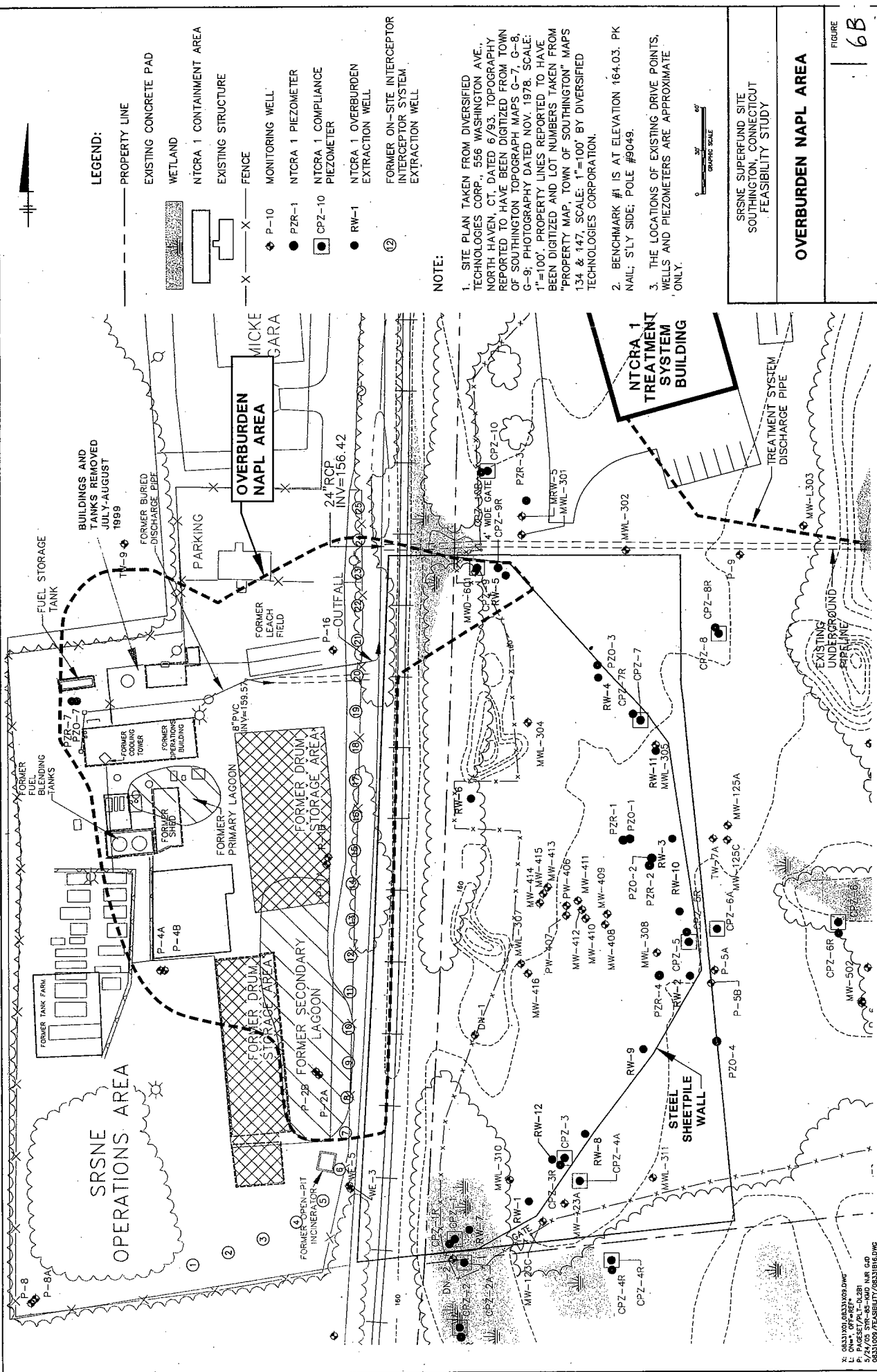
**LEGEND.**

- OVERBURDEN SHEET PILE WALL
- OVERBURDEN EXTRACTION WELL (12)
- GENERALIZED GROUND-WATER FLOW DIRECTIONS

**NOTE.**

1. MAPPING BASED ON FIGURE 1, SOLVENT RECOVERY SERVICE OF NEW ENGLAND GENERAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHWINGTON, CONNECTICUT, DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

X: 06331000  
L: 00000000  
U: 00000000  
D: 00000000  
S: 00000000  
E: 00000000  
R: 00000000  
P: 00000000  
06331000/FEASIBILITY/06331000.DWG



- LEGEND:**
- PROPERTY LINE
  - EXISTING CONCRETE PAD
  - WETLAND
  - NTCRA 1 CONTAINMENT AREA
  - EXISTING STRUCTURE
  - FENCE
  - P-10 MONITORING WELL
  - PZR-1 NTCRA 1 PIEZOMETER
  - CPZ-10 NTCRA 1 COMPLIANCE PIEZOMETER
  - RW-1 NTCRA 1 OVERBURDEN EXTRACTION WELL
  - ⑫ FORMER ON-SITE INTERCEPTOR

**NOTE:**

- SITE PLAN TAKEN FROM DIVERSIFIED TECHNOLOGIES CORP., 556 WASHINGTON AVE., NORTH HAVEN, CT, DATED 6/93. TOPOGRAPHY REPORTED TO HAVE BEEN DIGITIZED FROM TOWN OF SOUTHTON TOPOGRAPH MAPS G-7, G-8, G-9, PHOTOGRAPHY DATED NOV. 1978. SCALE: 1"=100'. PROPERTY LINES REPORTED TO HAVE BEEN DIGITIZED AND LOT NUMBERS TAKEN FROM "PROPERTY MAP, TOWN OF SOUTHTON" MAPS 134 & 147, SCALE: 1"=100' BY DIVERSIFIED TECHNOLOGIES CORPORATION.
- BENCHMARK #1 IS AT ELEVATION 164.03. PK NAIL; SLY SIDE; POLE #9049.
- THE LOCATIONS OF EXISTING DRIVE POINTS, WELLS AND PIEZOMETERS ARE APPROXIMATE ONLY.



SRSNE SUPERFUND SITE  
SOUTHTON, CONNECTICUT  
FEASIBILITY STUDY

**OVERBURDEN NAPL AREA**

FIGURE  
**6B**

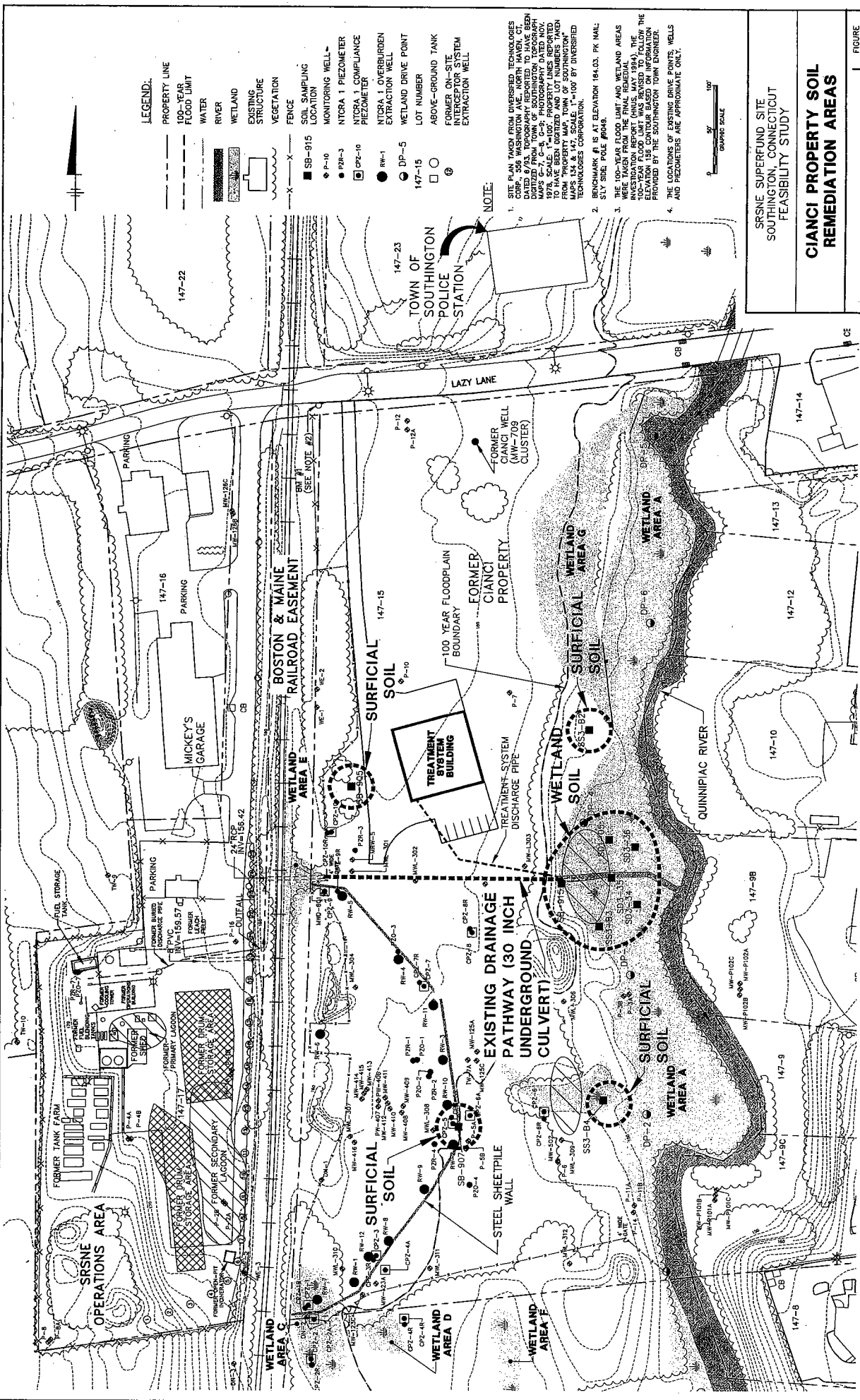


TABLE L-1  
INTERIM CLEANUP LEVELS FOR GROUNDWATER <sup>1</sup>

Chemical Name	Units	Interim Cleanup Level <sup>1</sup>	Basis of Interim Cleanup Level
1,1,1-Trichloroethane	ug/l	0.5	CT RSR
1,1,1,2-Tetrachloroethane	ug/l	0.5	CT RSR
1,1,2-Trichloroethane	ug/l	0.5	CT RSR
1,1-Dichloroethane	ug/l	0.5	CT RSR
1,1-Dichloroethene	ug/l	0.5	CT RSR
1,2-Dibromo-3-chloropropane	ug/l	0.05	CT RSR
1,2-Dichlorobenzene	ug/l	0.5	CT RSR
1,2-Dichloroethane	ug/l	0.5	CT RSR
1,4-Dichlorobenzene	ug/l	0.5	CT RSR
2-Butanone	ug/l	5	CT RSR
2-Hexanone	ug/l	5	CT RSR
4-Methyl-2-pentanone	ug/l	5	CT RSR
Acetone	ug/l	5	CT RSR
Benzene	ug/l	0.5	CT RSR
Bromomethane	ug/l	0.5	CT RSR
Carbon Disulfide	ug/l	0.5	CT RSR
Carbon tetrachloride	ug/l	0.5	CT RSR
Chlorobenzene	ug/l	0.5	CT RSR
Chloroethane	ug/l	0.5	CT RSR
Chloroform	ug/l	0.5	CT RSR
Chloromethane	ug/l	0.5	CT RSR
cis-1,2-Dichloroethene	ug/l	0.5	CT RSR
Ethylbenzene	ug/l	0.5	CT RSR
Methylene chloride	ug/l	0.5	CT RSR
Styrene	ug/l	0.5	CT RSR
Tetrachloroethene	ug/l	0.5	CT RSR
Tetrahydrofuran	ug/l	0.5	CT RSR
Toluene	ug/l	0.5	CT RSR
trans-1,2-Dichloroethene	ug/l	0.5	CT RSR
trans-1,3-Dichloropropene	ug/l	0.5	CT RSR
Trichloroethene	ug/l	0.5	CT RSR
Vinyl chloride	ug/l	0.5	CT RSR
Xylenes	ug/l	0.5	CT RSR
1,2,4-Trichlorobenzene	ug/l	2	CT RSR
2,4-Dimethylphenol	ug/l	10	CT RSR
2-Methylphenol	ug/l	10	CT RSR
4-Methylphenol	ug/l	10	CT RSR
Benzoic Acid	ug/l	10	CT RSR
bis(2-Ethylhexyl)phthalate	ug/l	10	CT RSR
Di-n-butyl phthalate	ug/l	10	CT RSR
Di-n-octyl phthalate	ug/l	10	CT RSR
Hexachlorobutadiene	ug/l	0.45 <sup>2</sup>	CT RSR
Isophorone	ug/l	10	CT RSR
Napthalene	ug/l	0.5 <sup>3</sup>	CT RSR
Phenol	ug/l	10	CT RSR
Aroclor-1254	ug/l	0.5	CT RSR
Aroclor-1260	ug/l	0.5	CT RSR



TABLE L-1  
 INTERIM CLEANUP LEVELS FOR GROUNDWATER <sup>1</sup>

Chemical Name	Units	Interim Cleanup Level <sup>1</sup>	Basis of Interim Cleanup Level
Aluminum	ug/l	(1)	CT RSR
Antimony	ug/l	(1)	CT RSR
Arsenic	ug/l	(1)	CT RSR
Barium	ug/l	(1)	CT RSR
Beryllium	ug/l	(1)	CT RSR
Cadmium	ug/l	(1)	CT RSR
Chromium (Total)	ug/l	(1)	CT RSR
Cobalt	ug/l	(1)	CT RSR
Copper	ug/l	(1)	CT RSR
Iron	ug/l	(1)	CT RSR
Lead	ug/l	(1)	CT RSR
Manganese	ug/l	(1)	CT RSR
Nickel	ug/l	(1)	CT RSR
Silver	ug/l	(1)	CT RSR
Thallium	ug/l	(1)	CT RSR
Vanadium	ug/l	(1)	CT RSR
Zinc	ug/l	(1)	CT RSR
4,4'-DDD	ug/l	0.1	CT RSR
Aldrin	ug/l	0.05	CT RSR
Ethanol	ug/l	1000	CT RSR
Isopropanol	ug/l	1000	CT RSR
Methanol	ug/l	1000	CT RSR
Sec-Butanol	ug/l	1000	CT RSR

Notes:

1. CT Remediation Standards Regulation requires that "Remediation of groundwater in a GA area shall result in reduction of each substance therein to a concentration equal to or less than the background concentration for groundwater of such substance...." (RCSA 22a-133k-3(a)(2). Where background concentrations are reported as non-detects, the analytical detection level as defined in the CT RSRs shall be the remedial goal. Background levels for metals will be established based on future field sampling and laboratory analyses.

2. A special request to the laboratory is needed to provide an analytical detection limit of 0.45 ug/l for hexachlorobutadiene.

3. The analytical detection limit for naphthalene is 0.5 ug/l via EPA Test Method 8260.

TABLE L-2  
SOIL AND WETLAND SOIL CLEANUP LEVELS FOR THE PROTECTION OF HUMAN HEALTH AND THE AQUIFER<sup>1</sup>

Chemical Name	Connecticut Residential Direct Exposure Criteria (mg/kg)	Connecticut GAA Pollutant Mobility Criteria (mg/kg) <sup>2</sup>	Soil Cleanup Level (mg/kg) <sup>1</sup>	Basis of Cleanup Level	Carcinogenic Risk <sup>3</sup>	Non-Carcinogenic Hazard Quotient <sup>3</sup>	Non-cancer Target Endpoint
1,1,1-Trichloroethane	500	4	4	CT RSR	-	NA	-
1,1,2,2-Tetrachloroethane	3.1	0.01	0.01	CT RSR	2.E-08	1.E-05	liver
1,1,2-Trichloroethane	11	0.1	0.1	CT RSR	1.E-07	3.E-03	blood
1,1-Dichloroethane	500	1.4	1.4	CT RSR	-	3.E-03	kidney
1,1-Dichloroethene	1	0.14	0.14	CT RSR	-	1.E-03	liver
1,2-Dichloroethene, Total	500	1.4	1.4	CT RSR	-	3.E-02	blood
1,2-Dichloropropane	9	0.1	0.1	CT RSR	3.E-07	NA	-
2-Butanone	500	8	8	CT RSR	-	4.E-03	fetal weight
4-Methyl-2-pentanone	500	7	7	CT RSR	-	1.E-03	liver/kidney
Acetone	500	14	14	CT RSR	-	1.E-03	kidney
Benzene	21	0.02	0.02	CT RSR	3.E-08	1.E-03	blood
Carbon tetrachloride	4.7	0.1	0.1	CT RSR	4.E-07	5.E-02	liver
Chlorobenzene	500	2	2	CT RSR	-	1.E-02	liver
Chlorodibromomethane	7.3	0.01	0.01	CT RSR	9.E-09	3.E-04	liver
Chloroform	100	0.12	0.12	CT RSR	6.E-07	2.E-03	liver
Ethylbenzene	500	10.1	10.1	CT RSR	-	5.E-03	liver
Methylene chloride	82	0.1	0.1	CT RSR	1.E-08	5.E-05	liver
Styrene	500	2	2	CT RSR	-	5.E-04	blood/immune
Tetrachloroethene	12	0.1	0.1	CT RSR	2.E-07	3.E-03	liver
Toluene	500	20	20	CT RSR	-	3.E-02	liver/kidney
Trichloroethene	56	0.1	0.1	CT RSR	2.E-06	6.E-03	liver/kidney/developmental
Vinyl chloride	0.32	0.04	0.04	CT RSR	5.E-07	1.E-03	liver
Xylenes, Total	500	19.5	19.5	CT RSR	-	7.E-02	body weight
2-Methylnaphthalene	474	0.98	0.98	CT RSR	NA	NA	-
4-Chloroaniline	270	1	1	CT RSR	-	4.E-03	spleen
4-Methylphenol	340	0.7	0.7	CT RSR	-	2.E-03	nervous system
Benzo(a)anthracene	1	1	1	CT RSR	2.E-06	-	-
Benzo(a)pyrene	1	1	1	CT RSR	2.E-05	-	-
Benzo(b)fluoranthene	1	1	1	CT RSR	2.E-06	-	-
Benzo(k)fluoranthene	8.4	1	1	CT RSR	2.E-07	-	-
bis(2-Ethylhexyl)phthalate	44	1	1	CT RSR	3.E-08	1.E-03	liver
Chrysene	84	1	1	CT RSR	2.E-08	-	-
Dibenzofuran	270	1	1	CT RSR	-	7.E-03	kidney
Di-n-butyl phthalate	1000	14	14	CT RSR	-	2.E-03	mortality
Di-n-octyl phthalate	1000	2	2	CT RSR	-	8.E-04	liver/thyroid

TABLE L-2  
SOIL AND WETLAND SOIL CLEANUP LEVELS FOR THE PROTECTION OF HUMAN HEALTH AND THE AQUIFER<sup>1</sup>

Chemical Name	Connecticut Residential Direct Exposure Criteria (mg/kg)	Connecticut GA, GAA Pollutant Mobility Criteria (mg/kg) <sup>2</sup>	Soil Cleanup Level (mg/kg) <sup>1</sup>	Basis of Cleanup Level	Carcinogenic Risk <sup>3</sup>	Non-Carcinogenic Hazard Quotient <sup>3</sup>	Non-cancer Target Endpoint
Fluoranthene	1000	5.6	5.6	CT RSR	-	2.E-03	liver
Indeno(1,2,3-cd)pyrene	1	1	1	CT RSR	2.E-06	-	-
Phenanthrene	1000	4	4	CT RSR	NA	NA	-
Pyrene	1000	4	4	CT RSR	-	2.E-03	kidney
2,3,7,8 TCDD -TEQ	NA <sup>4</sup>	NA <sup>4</sup>	lower of 0.001 mg/kg or background <sup>4</sup>	EPA Policy <sup>4</sup> / background	To be determined	-	-
PCBs Total	1	0.0005 mg/l <sup>2</sup>	1 mg/kg and 0.0005 mg/l <sup>2</sup>	CT RSR	5.E-06	9.E-01	immune
Antimony	27	0.006 mg/l <sup>2</sup>	27 mg/kg and 0.006 mg/l <sup>2</sup>	CT RSR	-	9.E-01	mortality/ blood
Arsenic	10	0.05 mg/l <sup>2</sup>	10 mg/kg and 0.05 mg/l <sup>2</sup>	CT RSR	3.E-05	5.E-01	skin
Barium	4700	1 mg/l <sup>2</sup>	4700 mg/kg and 1 mg/l <sup>2</sup>	CT RSR	-	9.E-01	kidney
Beryllium	2	0.004 mg/l <sup>2</sup>	2 mg/kg and 0.004 mg/l <sup>2</sup>	CT RSR	1.E-09	1.E-02	small intestine
Cadmium	34	0.005 mg/l <sup>2</sup>	34 mg/kg and 0.005 mg/l <sup>2</sup>	CT RSR	2.E-08	9.E-01	kidney
Chromium <sup>+3</sup>	3900	0.05 mg/l <sup>2.5</sup>	3900 mg/kg and 0.05 mg/l <sup>2.5</sup>	CT RSR	-	3.E-02	none
Chromium <sup>+6</sup>	100	0.05 mg/l <sup>2.5</sup>	100 mg/kg and 0.05 mg/l <sup>2.5</sup>	CT RSR	3.E-06	5.E-01	none
Lead	500	0.015 mg/l <sup>2</sup>	400 mg/kg <sup>6</sup> and 0.015 mg/l <sup>2</sup>	EPA Policy <sup>6</sup> / CT RSR	NA	NA <sup>6</sup>	nervous system

Total Cancer Risk<sup>7</sup> = 7.E-05

Cumulative HI by Target Endpoint

kidney	2.E+00
immune	9.E-01
mortality	9.E-01
skin	5.E-01
other endpoints	HI below 1

TABLE L-2  
SOIL AND WETLAND SOIL CLEANUP LEVELS FOR THE PROTECTION OF HUMAN HEALTH AND THE AQUIFER<sup>1</sup>

Notes:

NA = Not Available or Not Applicable

1. Soil Cleanup levels are the more stringent of the Connecticut Residential Direct Exposure Criteria (RDEC) or Pollutant Mobility Criteria (PMC) for those depths of soil where both RDEC and PMC apply, and where both RDEC and PMC are expressed in mass concentrations (e.g. mg/kg). Cleanup levels for those substances where PMC are leachate concentrations (see footnote 3), both RDEC and PMC apply except for lead where the cleanup level is based on EPA policy (see footnote 7) and the CT PMC for lead. Cleanup levels may revert to background concentrations if adequate documentation is provided.
2. For inorganics and PCBs, the Pollutant Mobility Criteria are based on leachate concentrations (expressed in mg/l) as obtained via either the SPLP or TCLP leaching procedures.
3. Cancer risk and non-cancer hazard are based on residential exposure and assume exposure parameters consistent with EPA Region 9 Preliminary Remediation Goals which reflect ingestion, dermal contact, and inhalation of the soil medium. Values for PCBs and inorganics reflect risk or hazard for cleanup levels expressed as a soil concentration (mg/kg).
4. There are no CT residential DEC or PMC for 2,3,7,8 TCDD-TEQ (Dioxin) in the CT RSRs. EPA and CT DEP have agreed that the cleanup level for 2,3,7,8-TCDD TEQ will be the lower of the EPA policy for residential sites (0.001 mg/kg per OSWER Directive # 9200.4-26 April 1998) and the background concentration which will be determined based on future field study, or another concentration consistent with CT RSRs, but not lower than background.
5. The PMC based cleanup levels for chromium (both trivalent and hexavalent) are based on a total chromium concentration.
6. The value of 400 mg/kg lead protects 95% of the exposed population from blood lead levels in excess of 10 ug/dl consistent with EPA's policy for lead (OSWER Directive #9355.4-12 July 14, 1994).
7. The total cancer risk does not include the risk attributed to 2,3,7,8 TCDD-TEQs as the cleanup level will be determined during remedial design.

**ATTACHMENT B**

**NTCRA 1 and NTCRA 2 Groundwater Extraction and Treatment System  
Demonstration of Compliance Requirements**

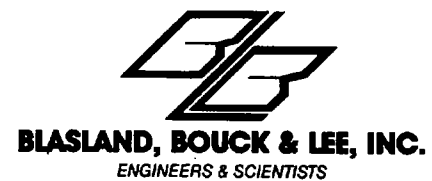
**NON-TIME-CRITICAL REMOVAL ACTION NO. 1  
DEMONSTRATION OF COMPLIANCE PLAN**

**Solvents Recovery Service of New England, Inc.  
Superfund Site**

**Southington, Connecticut**

**Prepared For:  
SRSNE PRP Group**

**June 1995**



#6207  
7/1988



***Non-Time-Critical Removal Action No. 1  
Demonstration of Compliance Plan***

Solvents Recovery Service of New England, Inc.  
Superfund Site  
Southington, Connecticut

Prepared For:  
SRSNE PRP Group

June 1995

**BLASLAND, BOUCK & LEE, INC.**  
**ENGINEERS & SCIENTISTS**

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## **1.0 - Introduction**

# 1.0 - Introduction



## 1.1 General

This Demonstration of Compliance Plan (DCP) was prepared by Blasland, Bouck & Lee, Inc. (BB&L) on behalf of the Solvents Recovery Service of New England, Inc. Superfund Site (SRSNE Site) PRP Group to verify the effectiveness of the Non-Time-Critical Removal Action No. 1 (NTCRA 1) ground-water containment and treatment system at the SRSNE Site in Southington, Connecticut. The original DCP, described in detail in the "NTCRA 1 100% Ground-Water Containment and Treatment System Design Report" (100% Design Report, BB&L, December 1994), was revised pursuant to United States Environmental Protection Agency (USEPA) comments, as presented in a letter to the SRSNE PRP Group dated April 21, 1995. In accordance with the NTCRA 1 Statement of Work (SOW), the DCP provides specific performance standards for the ground-water containment and treatment system, and criteria that will be used to evaluate the effectiveness of the system.

The ground-water containment system will be installed in the Containment Area, which is defined in the SOW as the general area within the former Cianci Property that is downgradient (east) of the Operations Area, upgradient (west) of the Lower Till Window, north of the Town of Southington wellfield property, and south of a 36-inch-diameter underground pipeline that traverses the former Cianci Property (Figure 1). In vertical section, the Containment Area includes the saturated outwash deposits from the water table to the top of the glacial till. Based on available geologic data for the site, a layer of glacial till is laterally continuous immediately above the weathered top of bedrock throughout the Containment Area (HNUS, May 1994; ENSR, June 1994; BB&L, December 1994). The thickness of the saturated outwash deposits above the till ranges from approximately 13 feet in the west-central portion of the Containment Area to approximately 24 feet along the eastern edge of the Containment Area.



The ground water extracted by the containment system will be pumped to the ground-water treatment system located in the treatment system building (Figure 1). Treated effluent from the treatment system will be discharged into the Quinnipiac River.

## **1.2 Ground-Water Containment System Design**

The proposed design for the ground-water containment system includes an array of ground-water extraction wells and a downgradient hydraulic barrier (steel sheetpiling) wall that will hydraulically and physically contain overburden ground water entering the Containment Area from the SRSNE Operations Area (Figure 2). The overburden ground-water extraction wells will extract overburden ground water on the upgradient (west) side of the hydraulic barrier wall, establishing an inward hydraulic gradient across the hydraulic barrier wall. The design of the hydraulic barrier wall and the ground-water extraction wells are described in detail in the 100% Design Report.

The results of numerical ground-water flow (MODFLOW) simulations, presented in Appendix B of the 100% Design Report (BB&L, December 1994) and the Addendum to Appendix B (BB&L, March 1995), predict that a hydraulic divide will be established downgradient of the hydraulic barrier wall during the implementation of the ground-water containment system. The overburden ground-water elevation (head) immediately inside (west of) the hydraulic barrier wall will be lower than the head outside (east of) the hydraulic barrier wall. The hydraulic divide (stagnation point) is expected to be situated approximately 100 feet downgradient of the hydraulic barrier wall during operation of the NTCRA 1 ground-water containment system. The hydraulic gradient will be generally inward toward the containment system, creating a continuum of hydraulic control in the overburden. East of the hydraulic divide, the hydraulic gradient will be eastward toward the river. West of the two ends of the hydraulic barrier wall, ground-water flow will converge into the hydraulic barrier wall.



### **1.3 Ground-Water Containment and Treatment System Performance Standards**

This DCP describes the acquisition and interpretation of field data that will be used to verify that the ground-water containment and treatment systems comply with the performance standards specified in the SOW. The performance standards for the containment system are to:

- Prevent the migration of all contaminated overburden ground water from the Operations Area of the SRSNE Site; and
- Prevent the migration of all contaminated overburden ground water from the Operations Area into the bedrock aquifer through the lower till window that forms the eastern boundary of the Containment Area.

The containment system performance standards will be evaluated based on the Reversal of Gradient Test, as presented in the SOW. The acquisition and analysis of field data for the Reversal of Gradient Test are described in Section 2.0 of this DCP.

The treatment system performance standards require that the system treat the impacted ground water pumped from the containment system to concentrations that meet all applicable or relevant and appropriate requirements (ARARs) prior to discharge to the Quinnipiac River. The treatment system effluent limits will be developed by the Connecticut Department of Environmental Protection (CT DEP).



## **1.4 Plan Organization**

The remaining sections of this DCP describe:

- The acquisition of field data that will be used to evaluate the effectiveness of the ground-water containment and treatment system (Section 2.0);
- Data interpretation and reporting (Section 3.0); and
- Adjustments to the ground-water containment and treatment system (Section 4.0).



## **2.0 - Field Data Acquisition**

## 2.0 - Field Data Acquisition



### 2.1 General

The data required to demonstrate compliance with the ground-water containment and treatment system performance standards will be obtained in the form of head measurements from wells and piezometers installed in the area of the containment system, flow measurements from the containment system recovery well array, and treatment system effluent pumping rates and analytical data. Field methods used to obtain the necessary data to demonstrate compliance will be performed in general accordance with the relevant standard operating procedures presented in the "Final Soil, Groundwater, and Additional Studies Workplan for the SRSNE Superfund Site" (ENSR, March 1994), which are included in Appendix A.

As specified in the SOW, the effectiveness of the ground-water containment system at achieving the performance standards will be evaluated based on the results of a Reversal of Gradient Test. The successful Reversal of Gradient Test will show that the following two requirements are achieved during operation of the ground-water containment system:

1. Within the Containment Area, overburden ground water east and downgradient of the Operations Area is flowing in the direction of the ground-water extraction wells; and
2. Overburden ground-water flow is reversed and maintained in the direction of the ground-water extraction wells within the area defined by (west of) the interpreted hydraulic divide that forms east of the ground-water containment system.

The Reversal of Gradient Test is to be demonstrated within a 30-day Compliance Period, which begins at the initiation of full-scale operation of the ground-water containment and treatment system, and during the entire operation of the system thereafter. The Reversal of Gradient Test results will be evaluated based on



field measurements of hydraulic heads at a specified array of monitoring locations installed within the saturated outwash. To verify that each of the two requirements of the Reversal of Gradient Test are satisfied during operation of the ground-water containment system, two different groups of wells and piezometers will be monitored, as described below.

## **2.2 Reversal of Gradient Test - Requirement #1**

To confirm that overburden ground water east and downgradient of the Operations Area within the Containment Area is flowing in the direction of the ground-water extraction wells (Reversal of Gradient Test Requirement #1), hydraulic head measurements will be obtained at the following wells/piezometers installed within the overburden in the general vicinity of the ground-water containment system: RW-1, RW-2, RW-3, RW-4, RW-5, RW-6, RW-7, RW-8, RW-9, RW-10, RW-11, MW-409, MW-415, MWL-301, MWL-304, MWL-305, MWL-307, MWL-308, MWL-310, P-16, P-2B, PZO-1, PZO-2, and PZO-3. Data will also be obtained at wells MWL-302, MWL-306, MWL-309, MWL-311, and TW-7A to assess the hydraulic response in the area between the hydraulic barrier wall and the Quinnipiac River. Also, to evaluate the vertical hydraulic gradient between the outwash deposits and the underlying till or bedrock during operation of the overburden ground-water containment system, comparative hydraulic head data will be measured at the following wells and piezometers installed in the till or bedrock: MW-408, MW-414, MW-416, PZR-1, PZR-2, and PZR-4. Ground-water elevations will be measured weekly at the locations listed above during the Compliance Period and the first 12 months of operation of the containment system.

## **2.3 Reversal of Gradient Test - Requirement #2**

To verify that overburden ground-water flow is reversed and maintained in the direction of the ground-water extraction wells within the area defined by (west of) the interpreted hydraulic divide that forms east of the containment system (Reversal of Gradient Test Requirement #2), five pairs of compliance piezometers, CPZ-1 through CPZ-10, will be installed at the locations shown on Figure 2. The SOW, which was prepared





under the assumption that the containment system would consist of only extraction wells and/or trenches, indicated that separate compliance piezometers should be installed in the shallow, middle, and deep outwash at each compliance monitoring location. The use of an essentially impermeable hydraulic barrier, however, renders separate piezometers unnecessary.

The NTCRA 1 compliance monitoring network includes one fully penetrating overburden piezometer at each compliance piezometer location. This design modification was approved by USEPA at a meeting with the SRSNE PRP Group on January 10, 1995 and documented in a letter from BB&L to USEPA dated January 12, 1995. At each compliance piezometer location, an overburden piezometer screened throughout the shallow, intermediate, and deep portions of the saturated outwash will be installed within a borehole drilled to the top of till. Each overburden piezometer will be constructed using Schedule 40 PVC and will include a 0.010-inch-slot screen installed within a Morie #0 or equivalent sand filter pack. A minimum one-foot-thick, hydrated bentonite seal will be placed above the filter pack, and the remainder of the borehole will be grouted to ground surface. In addition, a bedrock piezometer will be installed adjacent to each overburden compliance piezometer to allow an assessment of the hydraulic influence of NTCRA 1 on the bedrock flow system (Figure 2). Each piezometer will be developed to enhance the hydraulic connection between the piezometer and the surrounding formation.

Hydraulic head data, as well as the appropriate overburden hydraulic head data, will be measured at these bedrock piezometers on the last day of the Compliance Period. Hydraulic head data will be obtained from the overburden compliance piezometers on the same schedule as described for the bedrock piezometers.

The hydraulic gradient will be considered reversed, and inward toward the Containment Area when the hydraulic head data measured at the overburden compliance piezometers inside the hydraulic barrier wall (at locations CPZ-1, CPZ-3, CPZ-5, CPZ-7, and CPZ-9) are at least 0.3 feet lower than the heads measured at the corresponding overburden compliance piezometers located immediately opposite the wall. For example, hydraulic head data will be compared between the following pairs of overburden piezometers: CPZ-1 and CPZ-2; CPZ-3 and CPZ-4; CPZ-5 and CPZ-6; CPZ-7 and CPZ-8; CPZ-9 and CPZ-10.



As specified in the SOW, to verify the continuity of the reversal of the hydraulic gradient across the hydraulic barrier wall, relatively continuous hydraulic head measurements will be recorded at piezometers CPZ-5 and CPZ-6. These data will be obtained every four hours during the Compliance Period and the first 30 days thereafter, and on a daily basis during the remaining 11 months of the first year of containment-system operation.

## **2.4 Flow Rate Data**

In addition to the hydraulic head measurements described above, the flow rate from the containment system will be recorded continuously using an in-line totalizing flow meter and a strip chart recorder (located in the treatment system building) throughout the Compliance Period and the first 12 months thereafter. The cumulative volume of ground water pumped by the containment-system extraction wells will be documented daily during the first week of the Compliance Period, and on a weekly basis for the remainder of the Compliance Period and the first 12 months of system operation. The effluent from the treatment system will also be monitored to determine flow rate and water-quality characteristics, as required by the terms of the effluent limits to be established by the CT DEP.



## **3.0 - Demonstration of Compliance Reports**

## 3.0 - Demonstration of Compliance Reports



### 3.1 General

The results of the ground-water containment and treatment system monitoring activities described above will be presented in Demonstration of Compliance Reports, which will be submitted for USEPA review and approval within seven days of the end of the Compliance Period, and monthly thereafter. These reports will contain the information necessary to demonstrate compliance with the performance standards for the ground-water containment and treatment system, descriptions of adjustments made to the system, and conclusions regarding compliance, as well as the basis for these conclusions. If compliance is not demonstrated, based on the data acquired under the DCP, a plan and schedule will be presented describing the actions that will be undertaken to establish compliance with the performance standards in the SOW.

### 3.2 Ground-Water Containment System

To demonstrate the effectiveness of the ground-water containment system, Demonstration of Compliance Reports will include:

- A table of hydraulic head data measured each week during the Compliance Period, on the last day of the Compliance Period (in the first Compliance Report submittal) and every 30th day thereafter (in subsequent reports);
- Contour maps created using hydraulic head data measured on the last day of the Compliance Period in the first Compliance Report submittal and, in subsequent reports, every 30th day thereafter, which will show the hydraulic gradient and the location of the hydraulic divide within the saturated outwash; and



- Hydrographs created using hydraulic head data from compliance piezometers CPZ-5 and CPZ-6, which will verify the temporal continuity of the gradient reversal across the hydraulic barrier wall.

The hydraulic head contours will be used to interpret the location of the hydraulic divide and to verify that all overburden ground water between the Operations Area and the extraction wells, and between the extraction wells and the interpreted hydraulic divide, is flowing in the direction of the extraction wells. The tabulated hydraulic head data measured at pairs of compliance piezometers situated at the same depth interval on either side of the hydraulic barrier wall will be used to verify that the hydraulic gradient across the wall is inward (toward the west), based on a minimum hydraulic head differential of 0.3 feet as measured on either side of the wall. Also, tabulated hydraulic head data from wells/piezometers installed in the bedrock will be compared to the hydraulic head data from nearby wells/piezometers installed in the outwash to verify that the vertical gradient is upward in the vicinity of the containment system. The hydrographs created from data measured at compliance piezometers CPZ-5 and CPZ-6 will be used to verify that the gradient reversal at the hydraulic barrier wall is continuous through time. These hydrographs will also be compared to the hydraulic head contours, and a description of this comparison will be provided in the Demonstration of Compliance Reports.

Area(s) not in compliance with the performance standards and the location of the hydraulic divide will be identified based on the hydraulic head contour map presented in each Demonstration of Compliance Report. If the containment system performance standards are not demonstrated based on the compliance monitoring data, a plan and schedule will be presented in the same Demonstration of Compliance Report describing actions that will be taken to achieve the containment system performance standards.

### **3.3 Ground-Water Treatment System**

The Demonstration of Compliance Reports will also present the following information pertinent to the ground-water treatment system operation:



- Tabulated summary of the total volume of water pumped from the Containment Area and discharged to the Quinnipiac River;
- Tabulated summary of the analytical results from discharge monitoring specified by the CT DEP; and
- Tabulated comparison of the discharge monitoring analytical results to the effluent limits established by the CT DEP.

If the CT DEP effluent limits are not demonstrated by the compliance monitoring data for the treatment system, a plan and schedule will be presented in the Demonstration of Compliance Report describing modifications to the operation or design of the treatment system necessary to achieve the ground-water treatment system performance standards. Each Demonstration of Compliance Report will present a concluding statement addressing the status of compliance with the performance standards, as well as the other ARARs specified in the SOW. The current status of potential ARARs for NTCRA 1 is summarized on Table 1 of this document.



## **4.0 - System Adjustments**

## 4.0 - System Adjustments



If, based on the review of hydraulic head data measured at the site during the ground-water containment system operation, the system does not appear to satisfy the containment-system performance standards, adjustments will be made to the containment system to establish and maintain hydraulic containment. These adjustments may include modification of ground-water extraction rates at the extraction wells or installation of additional extraction wells, if necessary. Similarly, if the analytical results of samples from treatment system discharge do not meet the effluent limits established by the CT DEP, the treatment system will be modified, as necessary, to attain the requirements for discharge.





## **5.0 - References**

## 5.0 - References



Blasland, Bouck & Lee, Inc. "Ground-Water Containment System Modeling Results for Bedrock Ground-Water Extraction," Addendum to Appendix B of "Non-Time-Critical Removal Action 100% Ground-Water Containment and Treatment System Design Report," March 1995.

Blasland, Bouck & Lee, Inc. "Non-Time-Critical Removal Action 100% Ground-Water Containment and Treatment System Design Report." Solvents Recovery Service of New England, Inc. Site, December 1994.

ENSR Consulting & Engineering. "Groundwater Technical Memorandum, Soils Study Report, and Additional Studies Report for the SRSNE Superfund Site, Volume III - Additional Studies Report." Draft, June 1994.

Halliburton NUS Environmental Corporation. "Final Remedial Investigation Report." Solvents Recovery Service of New England, Inc. Site, May 1994.



# Table

Table 1

SRSNE, Inc. Superfund Site  
Southington, Connecticut

NTCRA 1 Potential ARARs

Authority	Requirement	Requirement Synopsis	Action to be Taken to Achieve ARAR	ARAR Status
Federal Regulatory Requirement	National Emissions Standards for Hazardous Air Pollutants (NESHAPS) (40 CFR 61)	These standards regulate emissions of hazardous air pollutants from specific manufacturing plants.	Air emissions from air strippers or other vapor control devices shall meet the requirements of these standards.	All tanks covered and vented to vapor-phase carbon.
Federal Criteria, Advisories, Guidance	EPA Carcinogen Assessment Group Potency Factors	EPA Carcinogenic Potency Factors are used to compute the individual incremental cancer risk resulting from exposure to carcinogens.	These factors were used to assess health risks from VOC carcinogens in soil.	N/A
Federal Criteria, Advisories, Guidance	EPA Risk Reference Doses (RfDs)	RfDs are dose levels developed by EPA for non-carcinogenic effects.	EPA RfDs were used to characterize risks due to exposure to VOCs in soil.	N/A
Federal Regulatory Requirements	Wetlands Executive Order (E.O. 11988), 40 CFR Part 6, Appendix A	Federal agencies are required to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands.	It is anticipated that the dewatering will not impact the wetlands. If wetlands are impacted, there is no practical alternative to in-situ soil treatment because of health risk from excavation of the soil. If wetlands are impacted, all alternatives shall include all practicable means of minimizing harm to wetlands.	Conceptual Wetlands Mitigation Plan submitted to USEPA on 4/28/95. USEPA approved on 6/9/95. Detailed mitigation design due on 9/30/95.
State Regulatory Requirements	Connecticut Inland Wetlands and Water Courses Regulations (Title 22a)	The regulations limit activities that deposit material in, alter, or pollute inland wetlands and water courses.	These regulations shall be met when water is discharged to the river.	Substantive requirement for water discharge to be issued by CT DEP. Draft issued 2/16/95.
Federal Regulatory Requirements	CWA-National Pollutant Discharge Elimination Systems (NPDES) (40 CFR 122, 125)	Any point-source discharge must meet substantive NPDES requirements which include meeting discharge limitations.	Treated ground water discharged to the Quinnipiac River shall comply with these requirements.	Substantive requirement for water discharge to be issued by CT DEP. Draft issued 2/16/95.
Federal Regulatory Requirements	National Ambient Air Quality Standards for Particulates (40 CFR 50)	This regulation sets standards for particulate matter.	Emissions of dust shall be controlled to ensure that standards are met during construction and operation of NTCRA.	N/A

**Table 1  
(Cont'd)  
SRSNE, Inc. Superfund Site  
Southington, Connecticut**

**NTCRA 1 Potential ARARs**

Authority	Requirement	Requirement Synopsis	Action to be Taken to Achieve ARAR	ARAR Status
Federal Regulatory Requirements	Resource Conservation and Recovery Act (40 CFR 264, Subpart A)	Regulations contain air emission standards for process vents, closed-vent systems and control devices at hazardous waste treatment, storage, or disposal facilities.	The air sparging/vapor extraction alternative shall meet the requirements of these regulations these regulations apply to.	N/A
Federal Regulatory Requirements	Resource Conservation and Recovery Act (40 CFR 265, Subpart P)	Regulations contain requirements for air emissions from thermal units.	The catalytic oxidation unit shall meet the requirements of these regulations as well as other alternatives these regulations apply to.	N/A
Federal Regulatory Requirements	Resource Conservation and Recovery Act (40 CFR 264, Subpart B)	Regulations contain general requirements for facilities.	The NTCRA shall meet these requirements.	NTCRA 1 facilities have been designed to meet substantive requirements of RCRA.
Federal Criteria, Advisories Guidance	Control of Air Emissions from Superfund Ground-Water Sites, (OSWER Directive 9355.0-28)	Guidance on the control of air emissions from CERCLA air strippers for ground-water treatment.	Any alternative involving use of an air stripper shall meet these requirements.	N/A
State Regulatory Requirements	Connecticut Water Quality Standards (Sec. 22a-426)	These requirements consist of surface water classifications which apply to certain waters within the state.	Discharges to surface waters shall be treated to ensure that there are no violations to water quality standards.	Substantive requirement for water discharge to be issued by CT DEP. Draft issued 2/16/95.
State Regulatory Requirements	Connecticut Discharge Permit Regulations (Sec. 22a-430)	These requirements supplement the CWS NPDES permit requirements for discharges to surface waters.	Ground water treated on site and discharged to the Quinnipiac River shall comply with the substantive standards contained in these regulations.	Substantive requirement for water discharge to be issued by CT DEP. Draft issued 2/16/95.
State Regulatory Requirements	Connecticut Air Pollution Control Regulations (Sec. 2a-174-29)	The regulations limit emissions from source. Hazardous air pollutant compounds have been identified under these regulations. Standards or thresholds have been developed.	Emissions from all components of the selected NTCRA treatment alternative shall meet these substantive requirements in these regulations.	All tanks covered and vented to vapor-phase carbon.

**Table 1  
(Cont'd)  
SRSNE, Inc. Superfund Site  
Southington, Connecticut**

**NTCRA 1 Potential ARARs**

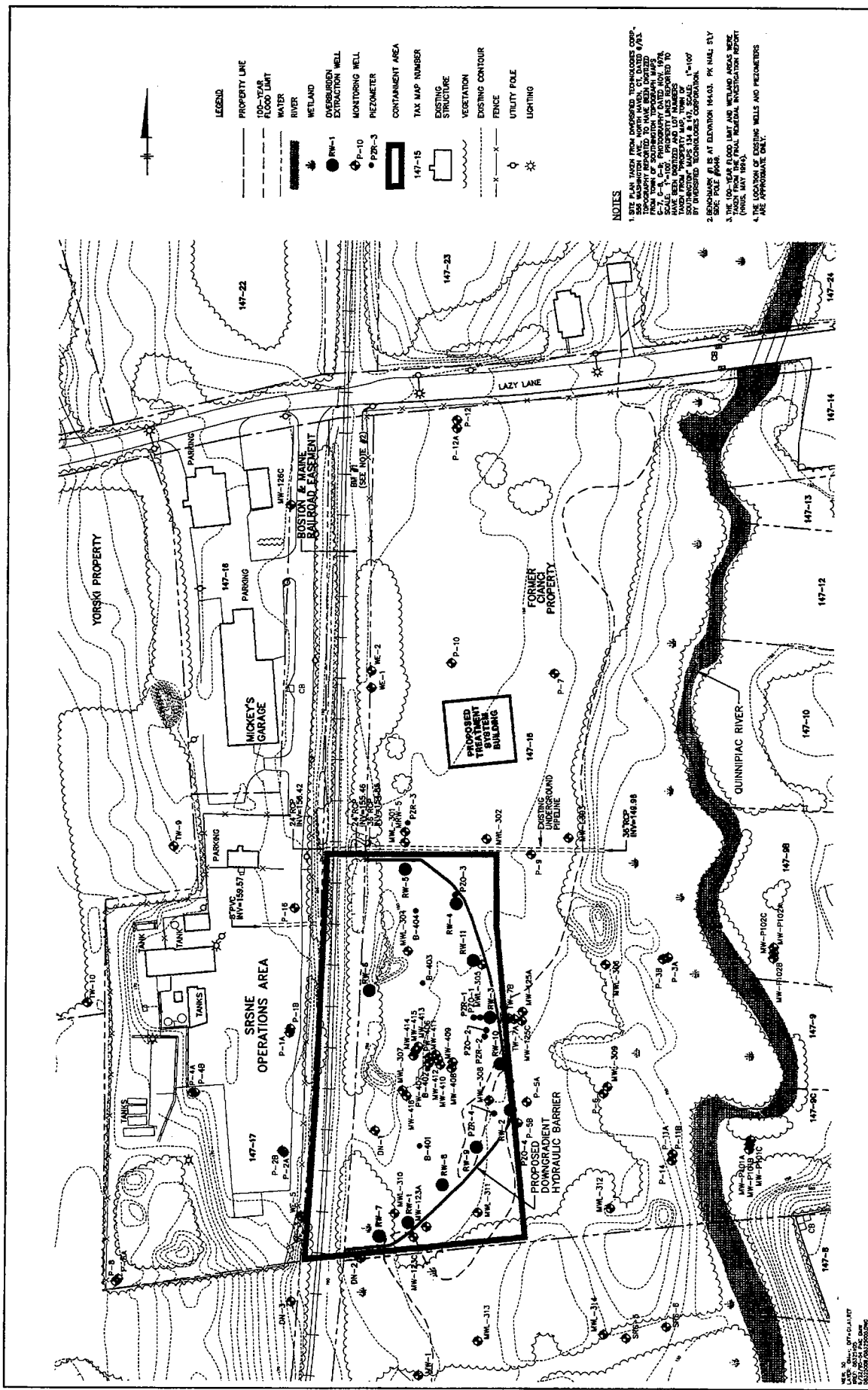
Authority	Requirement	Requirement Synopsis	Action to be Taken to Achieve ARAR	ARAR Status
State Regulatory Requirements	Connecticut Primary Ambient Air Quality Standards for Particulates (Sec. 22a-174-24)	This regulation sets standards for emissions of particulate matter.	Emissions of dust shall be controlled to ensure that standards are met during construction and operations of NTCRA.	N/A

**Notes:**

1. This table adapted from NTCRA 1 Statement of Work.
2. NA = Not applicable.



# Figures



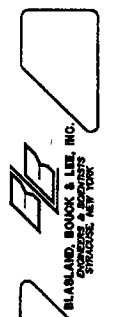
- LEGEND**
- PROPERTY LINE
  - 100-YEAR FLOOD LIMIT
  - WATER
  - WETLAND
  - OVERBURDEN EXTRACTION WELL
  - MONITORING WELL
  - PIEZOMETER
  - CONTAINMENT AREA
  - TAX MAP NUMBER
  - EXISTING STRUCTURE
  - VEGETATION
  - EXISTING CONTOUR
  - FENCE
  - UTILITY POLE
  - LIGHTING

**NOTES**

1. SITE PLAN TAKEN FROM DIMENSIONED TECHNOLOGIES CORP. TOPOGRAPHY REPORT TO HAVE BEEN LOCATED AT THE OFFICE OF SOUTHERN TECHNOLOGIES CORP. SCALE: 1"=100'. PROPERTY LINES REFERRED TO TAKEN FROM UNIVERSITY AND TOWN OF BOSTON RECORDS FOR 1911 & 1922. SCALE: 1"=100'.
2. BENCHMARK IS AT ELEVATION 164.03. PM NAL 817.
3. THE 100-YEAR FLOOD LIMIT AND WETLAND AREAS WERE DETERMINED FROM FEDERAL INVESTIGATION REPORT (FIRM NO. 1984).
4. THE LOCATION OF EXISTING WELLS AND PIEZOMETERS ARE APPROXIMATE ONLY.

FIGURE	1
The Number	
DALLS	
Date	JUNE 1985

SRSNE P&P GROUP • SOUTHERN, CONNECTICUT  
 DEMONSTRATION OF COMPLIANCE PLAN  
 SRSNE SITE  
**SITE PLAN**

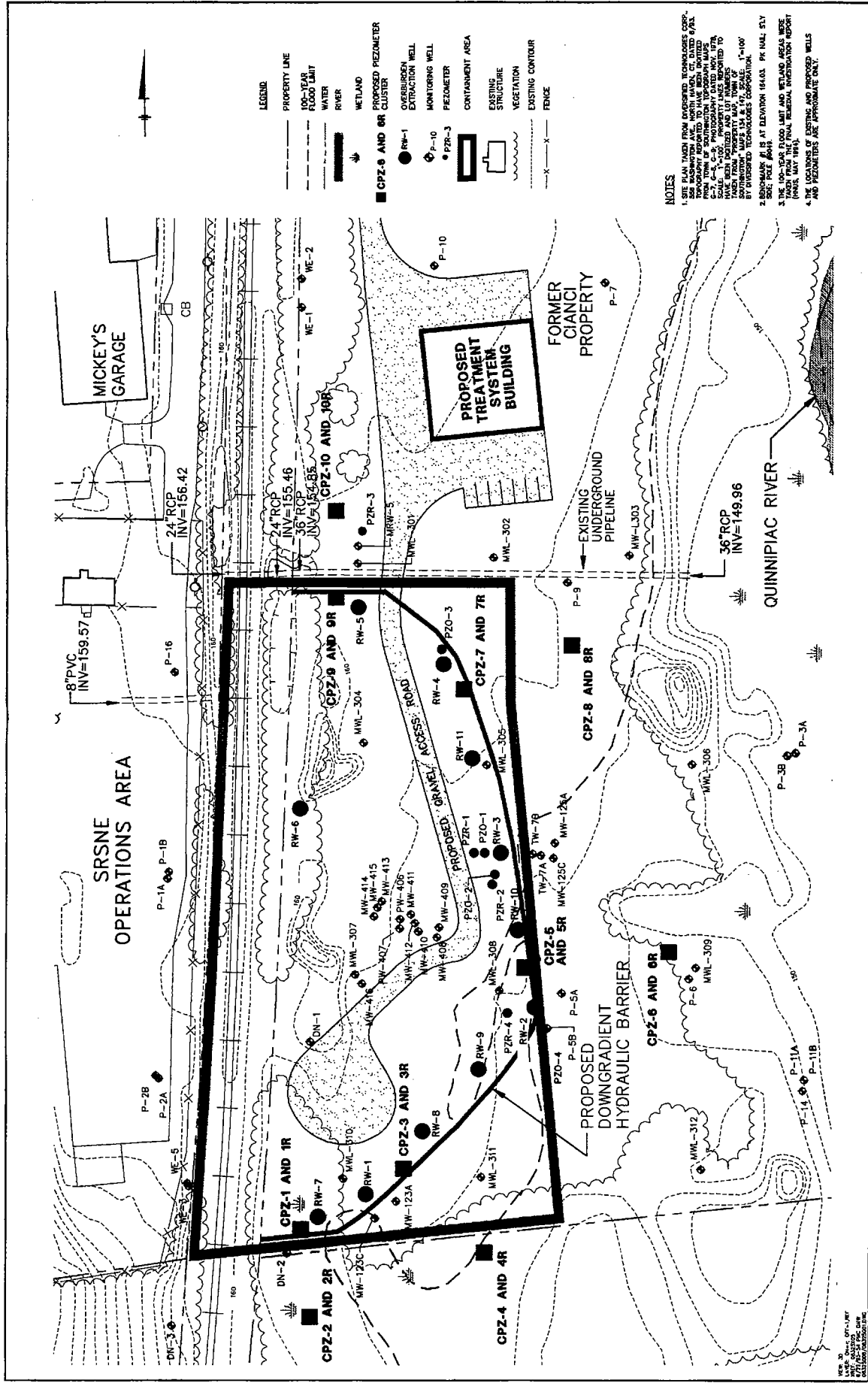


In charge of	
Designed by	
Drawn by	
Checked by	

No.	Date	Revisions

NO ALTERATIONS PERMITTED WITHOUT WRITTEN CONSENT OF THE ENGINEER.  
 P. OF THE NEW YORK STATE EDUCATION LAW





**LEGEND**

—	PROPERTY LINE
---	100-YEAR FLOOD LIMIT
—	WATER
—	RIVER
—	WETLAND
■	PROPOSED PIEZOMETER CLUSTER
●	RW-1
○	OVERBURDEN EXTRACTION WELL
○	MONITORING WELL
○	PZR-3
○	PIEZOMETER
□	CONTAINMENT AREA
□	EXISTING STRUCTURE
—	VEGETATION
—	EXISTING CONTOUR
—	FENCE

- NOTES**
1. SITE PLAN TAKEN FROM UNDESIGNED TECHNOLOGIES CORPORATION. UNDESIGNED TECHNOLOGIES CORPORATION IS NOT BEING WAIVED TO ANY EXTENT BY THE STATE OF CONNECTICUT. PHOTOGRAPHY DATED NOV. 1978.
  2. SCALE: 1"=100' PROPERTY LINES REPORTED TO STATE OF CONNECTICUT BY UNDESIGNED TECHNOLOGIES CORPORATION.
  3. 2000 MARK IS AT ELEVATION 104.03. PK. NAL. S.V.
  4. THE 100-YEAR FLOOD LIMIT AND WETLAND AREAS WERE DETERMINED BY THE STATE OF CONNECTICUT. (MAY 1978).
  5. THE LOCATIONS OF EXISTING AND PROPOSED WELLS AND PIEZOMETERS ARE APPROXIMATE ONLY.

SRSNE PER GROUP • SOUTHERN CONNECTICUT DEMONSTRATION OF COMPLIANCE PLAN SRSNE SITE <b>MONITORING LOCATIONS</b>	FIG. NUMBER	<b>2</b>
	DATE	
DESIGNED BY: _____ DRAWN BY: _____ CHECKED BY: _____	 <b>BLAIRLAND, BOUCK &amp; LEE, INC.</b> ENGINEERS & ARCHITECTS SPRINGFIELD, NEW YORK	

NO ALTERATIONS PERMITTED WITHOUT WRITTEN CONSENT OF THE ENGINEER. THIS PLAN IS A PART OF THE CONTRACT DOCUMENTS FOR THE PROJECT AND SHALL BE USED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

PLAN

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*Non-Time-Critical Removal Action No. 2  
Demonstration of Compliance Plan*

Solvents Recovery Service of New England Site  
Southington, Connecticut

Prepared For:  
SRSNE PRP Group

November 1999

**BBL**

BLASLAND, BOUCK & LEE, INC.  
engineers & scientists

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6723 Towpath Road, P.O. Box 66  
Syracuse, New York, 13214-0066  
(315) 446-9120

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# **1. Introduction**

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## **1.1 General**

This Demonstration of Compliance Plan (DCP) was prepared by Blasland, Bouck & Lee, Inc. (BBL) on behalf of the Solvents Recovery Service of New England Site (SRSNE Site) Potentially Responsible Party (PRP) Group to verify the effectiveness of the Non-Time-Critical Removal Action No. 2 (NTCRA 2) ground-water containment system. In accordance with the NTCRA 2 Statement of Work (SOW), the DCP provides specific performance standards for the ground-water containment system and criteria that will be used to evaluate its effectiveness.

The ground-water containment system was installed in the Town of Southington Wellfield Property (Figure 1). The NTCRA 2 Containment Area encompasses the majority of the northern portion of the Town of Southington Wellfield Property (Figure 2). In vertical section, the NTCRA 2 Containment Area includes the shallow and deep bedrock, extending to a depth of over 150 feet below the top of bedrock in the northern portion of the Town of Southington Wellfield Property. Further upgradient (north), the Containment Area extends over 180 feet below the top of bedrock and over 250 feet below ground surface (BBL, November 1998a; November 1998b; November 1999).

The ground water extracted by the containment system will be pumped to the existing NTCRA 1 ground-water treatment system located in the treatment system building (Figure 1). The NTCRA 1 treatment system and associated overburden ground-water extraction system started operation in July 1995. Effluent from the treatment system will continue to be discharged into the Quinnipiac River.

## **1.2 Ground-Water Containment System Design**

The ground-water containment system includes two ground-water extraction wells that, in combination with the NTCRA 1 containment system, will hydraulically contain bedrock ground water migrating from the SRSNE Operations Area (Figure 2). The design of overburden and bedrock ground-water extraction wells RW-13 and RW-1R is described in the NTCRA 2 100% Ground-Water System Design Report (BBL, November 1999).

The results of numerical ground-water flow (MODFLOW) simulations, presented in Appendix B of the Draft Feasibility Study Report (BBL, November 1998a) and NTCRA 2 Technical Memorandum (November 1998b) predict that a hydraulic divide will be established downgradient (south) of the extraction wells during the implementation of the ground-water containment system. During a pumping test of well RW-13 in August 1998 (BBL, November 1998a and November 1998b) and an Interim Ground-Water Containment Evaluation using wells RW-13 and RW-1R (BBL, November 1999), the hydraulic divide and Containment Area were verified based on empirical hydraulic head measurements. The hydraulic divides (stagnation points) in the shallow and deep bedrock were situated approximately 400 feet and 270 feet downgradient (south) of the extraction wells during pumping from wells RW-13 and RW-1R. During operation of the NTCRA 2 ground-water containment system, the hydraulic gradient will be inward toward the containment system, creating a continuum of hydraulic control in the bedrock. South of the hydraulic divide, the hydraulic gradient will be southward toward the bend in the river. North of the hydraulic divide, bedrock ground water will converge toward the extraction wells.

## **1.3 Containment System Performance Standards**

The effectiveness of the NTCRA 2 ground-water containment system will ultimately be evaluated based on the performance standards summarized below, which are specified by the NTCRA 2 SOW.

- *The bedrock ground-water containment system shall minimize, to the extent reasonably practicable, the flow of bedrock ground water from the Operations Area of the site.* This provision acknowledges the inherent complexity of containing ground-water flow in fractured bedrock. A substantial degree of bedrock ground-water containment

---

required under this provision will be met through the continued operation of the existing NTCRA 1 overburden ground-water containment system, which achieves demonstrable bedrock ground-water containment (BBL, November 1998a). Additional ground-water extraction downgradient of the NTCRA 1 system as part of NTCRA 2 will provide a backup containment system for bedrock ground water, which will hydraulically contain the dissolved-phase plume of volatile organic compounds (VOCs) above Federal Maximum Contaminant Levels (MCLs) in bedrock downgradient of the NTCRA 1 bedrock ground-water containment area (Figure 2).

- *The containment system shall establish a three-dimensional Area of Containment downgradient of the Operations Area, which will be defined in the NTCRA 2 Demonstration of Compliance Plan.* While ground-water flow in fractured media is complex, the bedrock hydraulic responses observed during the pumping tests of overburden well RW-13 +/- bedrock well RW-1R were reasonably systematic. As summarized in the NTCRA 2 Technical Memorandum (BBL, November 1998b) and the NTCRA 2 100% Ground-Water System Design Report (BBL, November 1999), the bedrock ground-water containment area can be delineated using empirical hydraulic head measurements. The containment area shown on Figure 2 will be monitored using select wells and piezometers in the shallow and deep bedrock.

It should be noted that a short duration shutdown will not have a significant impact on long-term groundwater containment. As long as pumping (containment) is restored within several days, there would be minimal effect on long-term VOC migration, as explained in more detail below. The intent of this discussion is to propose that short-term interruptions in pumping be subject to reporting as such in the routine monthly and/or quarterly reports, and not as "losses of containment" subject to force major reporting. Significant issues, or projected downtime exceeding one week would continue to be reported promptly to the agencies, with written follow-up reports within 7 days. This approach would reduce administrative reporting.

- *Within 60 days of NTCRA 2 system startup and during the entire operation of the system thereafter, it shall be demonstrated, based on a Containment Test, that bedrock ground water within the Area of Containment is flowing in the direction of the NTCRA 2 bedrock ground-water containment system.* While containment is expected to be demonstrated within 60 days following the startup of the NTCRA 2 system, bedrock ground-water containment downgradient of the SRSNE Site is not considered to be time-critical given that: 1) no ground-water receptors are situated within the bedrock VOC plume associated with the SRSNE Site, as delineated in the final RI Report (BBL, June 1998) and verified by Interim Monitoring and Sampling (BBL, February 1999; July 1999); 2) no active ground-water receptors are situated downgradient of the SRSNE-related bedrock VOC plume, which would attenuate or discharge into the Quinnipiac River near Curtiss Street (Figure 2) if allowed to migrate unabated; 3) no VOCs were detected above Federal MCLs downgradient of the estimated NTCRA 2 containment area during the most recent sampling event (BBL, July 1999); 4) the plumes of VOCs in the shallow and deep bedrock are already attenuating (BBL, June 1998; February 1999; and July 1999) and 5) using detailed, site-specific solute-transport parameters quantified during the completion of the RI, the average linear velocity of the SRSNE-related VOC plume in bedrock was estimated as 0.037 ft/day (14 ft/year; BBL, June 1998). Thus, a one-month downtime would result in negligible (approximately one foot of) plume migration.
- *System adjustments shall be made, as appropriate, to satisfy the objectives listed above.* NTCRA 2 compliance will be evaluated on a relatively continuous basis, similar to NTCRA 1 compliance, and system adjustments (e.g., pump and well maintenance, level control cleaning, or potentially addition of new pumping wells) will be made, as necessary, to maintain containment.

#### 1.4 Plan Organization

The remaining sections of this DCP describe:

- 
- The acquisition of field data that will be used to evaluate the effectiveness of the ground-water containment system (Section 2);
  - Data interpretation and reporting (Section 3); and
  - Adjustments to the ground-water containment system (Section 4).

## **2. Field Data Acquisition**

### **2.1 General**

The data required to demonstrate compliance with the ground-water containment and treatment system performance standards will be obtained in the form of head measurements from wells and piezometers installed in the area around the containment system, flow measurements from the containment-system extraction wells, and treatment system effluent pumping rates and analytical data.

As specified in the SOW, the effectiveness of the ground-water containment system at achieving the performance standards will be evaluated based on the results of a Containment Test. The successful Containment Test will show that the following two conditions are achieved during operation of the ground-water containment system:

1. Within the NTCRA 2 Containment Area, bedrock ground water with dissolved contaminants east and downgradient of the Operations Area is flowing in the direction of the ground-water containment system; and
2. All bedrock ground-water flow downgradient of the NTCRA 2 extraction system within the Containment Area is reversed and maintained in the direction of the ground-water containment system.

The Containment Test is to be satisfactorily demonstrated within a 60-day Compliance Period, which begins at the initiation of full-scale operation of the bedrock ground-water containment system, and during the entire operation of the system thereafter. The Containment Test results will be evaluated based on field measurements of hydraulic heads at a specified array of monitoring locations installed within the shallow and deep bedrock. To verify that each of the two requirements of the Containment Test are satisfied during operation of the NTCRA 2 Ground-Water Containment System, two different groups of wells and piezometers will be monitored, as described below.

### **2.2 Containment Test - Requirement #1**

To confirm that VOC-impacted bedrock ground water east and downgradient of the Operations Area within the Containment Area is flowing in the direction of the ground-water extraction wells (Containment Test Requirement #1), hydraulic head measurements will be obtained at the following pairs of wells/piezometers in the general vicinity upgradient (north) of the ground-water containment system (Figure 2):

- Shallow bedrock - MW-704R and MW-121A; and
- Deep bedrock - MW-704DR and MW-705DR.

Ground-water elevations will be measured monthly at these locations.

### **2.3 Containment Test - Requirement #2**

To verify that bedrock ground-water flow downgradient of the extraction system within the Containment Area is reversed and maintained in the direction of the ground-water containment system, (Containment Test Requirement #2), hydraulic head measurements will be obtained at the following locations shown on Figure 2:

- Shallow bedrock - MW-704R, MW-204A, PZR-2R, and PZR-4R; and
- Deep bedrock - MW-704DR, PZR-2DR, and PZR-4DR.

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Hydraulic head data will be measured monthly at these bedrock monitoring wells and piezometers.

The hydraulic gradient will be considered reversed, and inward toward the Containment Area when the hydraulic head data measured at the shallow and deep bedrock monitoring wells MW-704R and MW-704DR located adjacent to extraction wells RW-13 and RW-1R, are lower than the heads measured at the corresponding shallow bedrock and deep bedrock monitoring wells and piezometers listed above.

As specified in the SOW, to verify the continuity of the reversal of the hydraulic gradient, daily hydraulic head measurements will be recorded either manually or via transducer/data logger at the following locations:

- Shallow bedrock - MW-704R and PZR-2R; and
- Deep bedrock - MW-704DR and PZR-2DR.

These data will be obtained daily during the first year of containment-system operation.

## **2.4 Flow Rate Data**

In addition to the hydraulic head measurements described above, the flow rate from the containment system will be recorded continuously using an in-line totalizing flow meter (located in the treatment system building) throughout the first 12 months of containment system operation. The cumulative volume of ground water pumped by the containment-system extraction wells will be documented daily during the first week of the Compliance Period, and on a weekly basis for the remainder of the first 12 months of system operation. The effluent from the treatment system will also be monitored as part of the routine NTCRA 1 monitoring program to determine flow rate and water-quality characteristics, as required by the terms of the effluent limits established for the NTCRA 1 treatment system by the Connecticut Department of Environmental Protection (CT DEP).



### **3. Demonstration of Compliance Reports**

#### **3.1 General**

The results of the ground-water containment and treatment system monitoring activities described above will be presented in Demonstration of Compliance Reports, which will be submitted to the United States Environmental Protection Agency (USEPA) on a monthly basis for the first three months of containment system operation and quarterly thereafter. These reports will contain the information necessary to demonstrate compliance with the performance standards for the ground-water containment and treatment system, descriptions of adjustments made to the system, and conclusions regarding compliance, as well as the basis for these conclusions. If compliance is not demonstrated, based on the data acquired under the DCP, a plan and schedule will be presented describing the actions that will be undertaken to establish compliance with the performance standards in the SOW.

#### **3.2 Ground-Water Containment System**

To demonstrate the effectiveness of the ground-water containment system, Demonstration of Compliance Reports will include:

- A table of hydraulic head data measured each period; and
- Hydrographs created using hydraulic head data from monitoring wells MW-704R and MW-704DR, and piezometers PZR-2R and PZR-2DR, which will verify the temporal continuity of the gradient reversal.

The hydraulic head measurements will be used to verify that bedrock ground water between the Operations Area and the extraction wells, and between the extraction wells and the Containment Area boundary (hydraulic divide) is flowing in the direction of the extraction wells. The tabulated hydraulic head data measured at wells and piezometers situated at the same depth interval (shallow or deep bedrock) will also be used to verify that the hydraulic gradient is inward toward the extraction wells. The hydrographs created from data measured daily at monitoring wells MW-704R and MW-704DR, and piezometers PZR-2R and PZR-2DR will be used to verify that the gradient reversal is continuous through time.

Area(s) not in compliance with the performance standards and the location of the hydraulic divide will be identified based on the hydraulic heads tabulated in each Demonstration of Compliance Report. If the containment system performance standards are not demonstrated based on the compliance monitoring data, a plan and schedule will be presented in the same Demonstration of Compliance Report describing actions that will be taken to achieve the containment system performance standards.

#### **3.3 Ground-Water Treatment System**

The Demonstration of Compliance Reports will also present the following information pertinent to the ground-water treatment system operation:

- Tabulated summary of the total volume of water pumped from the NTCRA 2 Containment System and treated by the NTCRA 1 treatment system; and
- Comparison of the discharge monitoring analytical results to the effluent limits established by the CT DEP.

If the CT DEP effluent limits are not demonstrated by the NTCRA 1 monitoring data for the treatment system, a plan and schedule will be presented in the Demonstration of Compliance Report describing modifications to the operation or design of the treatment system necessary to achieve the ground-water treatment system performance

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standards. Each Demonstration of Compliance Report will present a concluding statement addressing the status of compliance with the performance standards.

## **4. System Adjustments**

If, based on the review of hydraulic head data measured at the site during the ground-water containment system operation, the system does not appear to satisfy the containment-system performance standards, adjustments will be made to the containment system to establish and maintain hydraulic control. These adjustments may include the modification of ground-water extraction rates at the extraction wells or the installation of additional extraction wells, if necessary. Similarly, if the analytical results of samples from the treatment system effluent do not meet the effluent limits established by the CT DEP, the treatment system will be modified, as necessary, to attain the requirements for discharge. Any brief interruption (i.e., less than one week) will be noted in Demonstration of Compliance Reports, including the cause and duration of the interruption and actions taken to rectify it. Any potentially longer-term interruption will be verbally reported to USEPA, and a written plan will be submitted within one week of the interruption describing the proposed actions to remedy the interruption and re-establish containment.

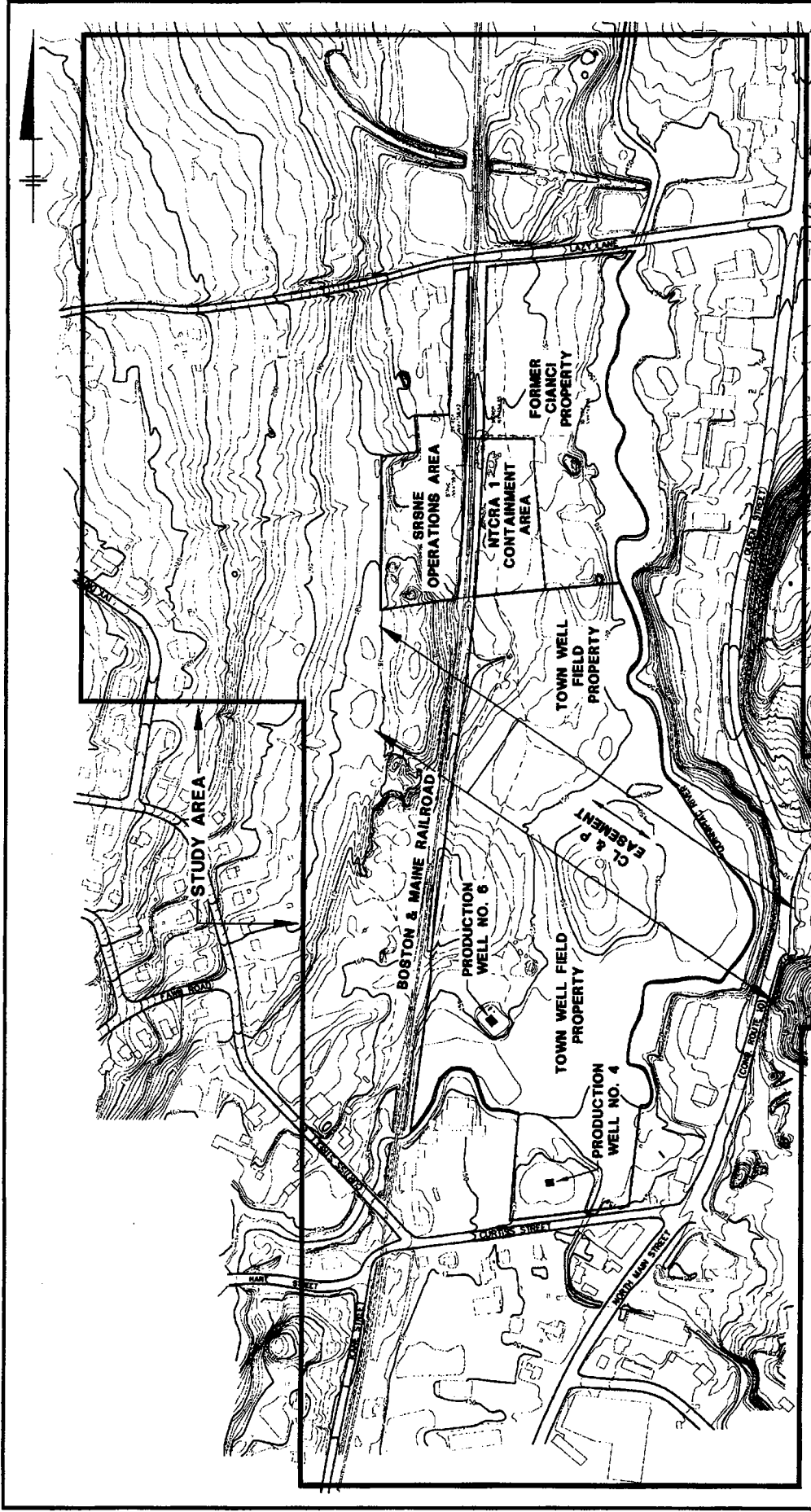
## **5. References**

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Blasland, Bouck & Lee, Inc. "Draft Feasibility Study." Solvents Recovery Service of New England Site, November 1998a.

Blasland, Bouck & Lee, Inc. "Draft NTCRA 2 Technical Memorandum." Solvents Recovery Service of New England Site, November 1998b.

Blasland, Bouck & Lee, Inc. "Draft NTCRA 2 100% Design Report." Solvents Recovery Service of New England Site, November 1999.



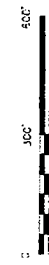
SRBNE PRP GROUP  
SOUTHINGTON, CONNECTICUT  
NTRCA 2  
DEMONSTRATION OF COMPLIANCE PLAN

SITE PLAN

**BBL**  
BASILIANO, BRUCE & LEE, INC.  
engineers & scientists

FIGURE 1

Original includes color coding.



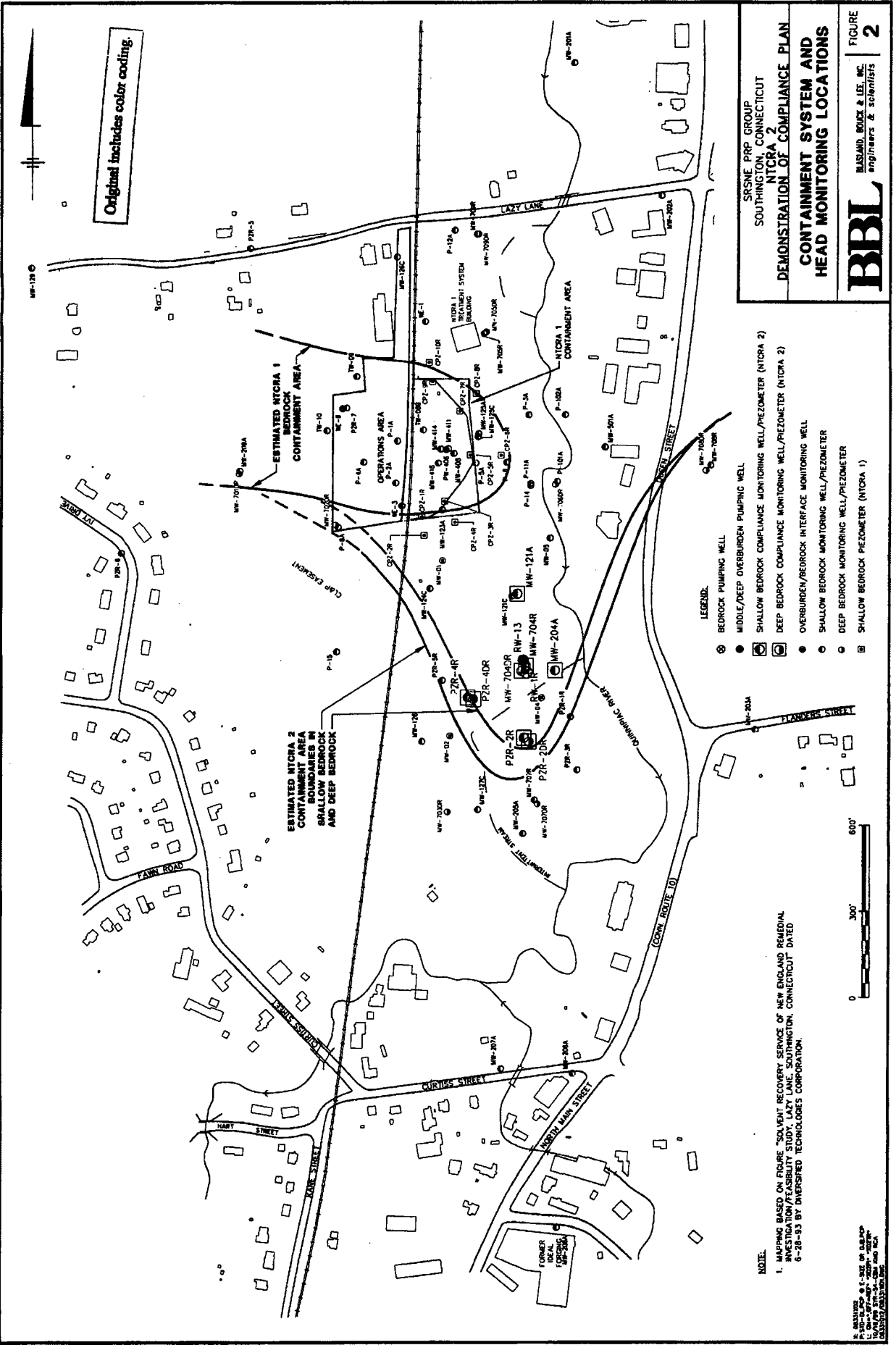
LEGEND

- ELEVATION CONTOUR (10' INTERVAL)
- ELEVATION CONTOUR (20' INTERVAL)
- ELEVATION CONTOUR (50' INTERVAL)

NOTE

1. MAPS NOT BASED ON "GURE" SURVEY RECOVERY SERVICE OF NEW ENGLAND E.W.E.A. INVESTIGATION REPORT BY T.J. JOY, 1987, AND 500' VERTICAL CURVATURE DATA. 5' 78' 33" S. 85' 15" W. 5' 78' 33" S. 85' 15" W. 5' 78' 33" S. 85' 15" W.

2. DATE: 08/05/2000  
3. DRAWN BY: [illegible]  
4. CHECKED BY: [illegible]



SRSNE PRP GROUP  
SOUTHINGTON, CONNECTICUT  
NTCRA 2  
**DEMONSTRATION OF COMPLIANCE PLAN**  
**CONTAINMENT SYSTEM AND**  
**HEAD MONITORING LOCATIONS**

**BBL**  
BUSLAND, BOCK & DEB, INC.  
engineers & scientists  
**FIGURE 2**

- LEGEND:
- BEDROCK PUMPING WELL
  - MIDDLE/DEEP OVERBURDEN PUMPING WELL
  - SHALLOW BEDROCK COMPLIANCE MONITORING WELL/PIEZOMETER (NTCRA 2)
  - DEEP BEDROCK COMPLIANCE MONITORING WELL/PIEZOMETER (NTCRA 2)
  - OVERBURDEN/BEDROCK INTERFACE MONITORING WELL
  - SHALLOW BEDROCK MONITORING WELL/PIEZOMETER
  - DEEP BEDROCK MONITORING WELL/PIEZOMETER
  - SHALLOW BEDROCK PIEZOMETER (NTCRA 1)

NOTE:  
1. MAPPING BASED ON FIGURE 2 SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL  
SERVICES, INC. (SERVICES) REMEDIATION MONITORING SYSTEM (RMS) DATA  
6-20-93 BY INTERSOL TECHNOLOGIES CORPORATION.

2. MATERIALS & METHODS OF ANALYSIS  
P-101-10-93P & P-101-10-93M  
P-101-10-93P & P-101-10-93M  
P-101-10-93P & P-101-10-93M  
P-101-10-93P & P-101-10-93M

ATTACHMENT C  
PROJECT OPERATIONS PLAN

Before any field activities commence on the Site, Settling Defendants shall submit several site-specific plans to establish procedures to be followed by the Settling Defendants in performing field, laboratory, and analysis work and community and agency liaison activities. These site-specific plans include the:

- A. Site Management Plan (SMP),
- B. Sampling and Analysis Plan (SAP),
- C. Health and Safety Plan (HSP), and
- D. Community Relations Support Plan (CRSP).

These plans shall be combined to form the Site Project Operations Plan (POP). The four components of the POP are described in A. through D. herein.

The format and scope of each Plan shall be modified as needed to describe the sampling, analyses, and other activities that are clarified as the RD/RA progresses. EPA may modify the scopes of these activities at any time during the RD/RA at its discretion in response to the evaluation of RD/RA results, changes in RD/RA requirements, and other developments or circumstances.

A. Site Management Plan (SMP)

The Site Management Plan (SMP) shall describe how the Settling Defendants will manage the project to complete the Work required at the Site. As part of the plan the Settling Defendants shall perform the following tasks:

1. Provide a map and list of properties, the property owners, and addresses of owners to whose property access may be required.
2. Clearly indicate the exclusion zone, contamination reduction zone, and clean area for on-site activities.
3. Establish necessary procedures and provide sample letters to land owners to arrange field activities and to ensure EPA and CT DEP are apprised of access-related problems and issues.
4. Provide for the security of government and private property on the Site.
5. Prevent unauthorized entry to the Site, which might result in exposure of persons to potentially hazardous conditions.

6. Establish the location of a field office for on-site activities.
7. Provide contingency and notification plans for potentially dangerous activities associated with the RD/RA.
8. Monitor airborne contaminants released by Site activities which may affect the local populations.

The overall objective of the Site Management Plan is to provide EPA and CT DEP with a written understanding and commitment of how various project aspects such as access, security, contingency procedures, management responsibilities, waste disposal, budgeting, and data handling are being managed by the Settling Defendants. Specific objectives and provisions of the Site Management Plan shall include, but are not limited to the following:

1. Communicate to EPA, CT DEP, and the public the organization and management of the RD/RA, including key personnel and their responsibilities.
2. Provide a list of contractors and subcontractors of the Settling Defendants in the RD/RA and description of their activities and roles.
3. Provide regular financial reports of the Settling Defendants' expenditures on the RD/RA activities.
4. Provide for the proper disposal of materials used and wastes generated during the RD/RA (e.g., drill cutting, extracted ground water, protective clothing, disposable equipment). These provisions shall be consistent with the off-site disposal aspects of SARA, RCRA, and applicable state laws. The Settling Defendants, or their authorized representative, or another party acceptable to EPA and CT DEP shall be identified as the generator of wastes for the purpose of regulatory or policy compliance.
5. Provide plans and procedures for organizing, manipulating, and presenting the data generated and for verifying its quality before and during the RD/RA.

The last item shall include a description of the computer data base management systems that are compatible with hardware available to EPA Region I personnel for handling media-specific sampling results obtained before and during the RD/RA. The description shall include data input fields, examples of data base management output from the coding of all RD/RA sample data, appropriate quality assurance/quality control to ensure accuracy, and capabilities of data manipulation. To the degree possible, the data base management parameters shall be compatible with the EPA Region I data storage and analysis system.



## B. Sampling and Analysis Plan (SAP)

The SAP shall be consistent with Section VIII of the Consent Decree (Quality Assurance, Sampling, and Data Analysis). The SAP consists of both (1) a Quality Assurance Project Plan (QAPP) that describes the policy, organization, functional activities, and the quality assurance and quality control protocols necessary to achieve the data quality objectives dictated by the intended use of the data; and (2) the Field Sampling Plan (FSP) that provides guidance for all fieldwork by defining in detail the sampling and data-gathering methods to be used on a project. Components required by these two plans are described below. In addition, the FSP and QAPP should be submitted as a single document (although they may be bound separately to facilitate use of the FSP in the field.)

The overall objectives of the Sampling and Analysis Plan are as follows:

1. to document specific objectives, procedures, and rationales for fieldwork and sample analytical work;
2. to provide a mechanism for planning and approving Site and laboratory activities;
3. to ensure that sampling and analysis activities are necessary and sufficient and are representative of the heterogeneities at the site (e.g., distribution of DNAPL in the subsurface); and
4. to provide a common point of reference for all parties to ensure the comparability and compatibility of all objectives and the sampling and analysis activities.

To achieve this last objective, the SAP shall document all field and sampling and analysis objectives as noted above, as well as all data quality objectives and specific procedures/protocols for field sampling and analysis set forth by the Site Management Plan.

The following critical elements of the SAP shall be described for each sample medium (e.g., ground water, surface water, soil, sediment, air, and biota) and for each sampling event:

1. sampling objectives;
2. data quality objectives, including data uses and the rationale for the selection of analytical levels and detection limits,
3. site background update, including an evaluation of the validity, sufficiency, and sensitivity of existing data;
4. sampling locations and rationale;

5. sampling procedures and rationale and references;
6. numbers of samples and justification;
7. numbers of field blanks, trip blanks, and duplicates;
8. sample media (e.g., ground water, surface water, soil, sediment, air, and buildings, facilities, and structures, including surfaces, structural materials, and residues);
9. sample equipment, containers, minimum sample quantities, sample preservation techniques, maximum holding times;
10. instrumentation and procedures for the calibration and use of portable air, soil-, or water-monitoring equipment to be used in the field;
11. chemical and physical parameters in the analysis of each sample;
12. chain-of-custody procedures must be clearly stated (see EPA NEIC Policies and Procedures Manual, EPA 330/9-78 001-R) May 1978, revised May 1986;
13. procedures to eliminate cross-contamination of samples (such as dedicated equipment);
14. sample types, including collection methods and if field and laboratory analyses will be conducted;
15. laboratory analytical procedures, equipment, and detection limits;
16. equipment decontamination procedures;
17. consistency with the other parts of the Work Plan(s) by having identical objectives, procedures, and justification, or by cross-reference; and
18. for any limited field investigation (field screening technique), provisions for the collection and laboratory analysis of parallel samples and for the quantitative correlation analysis in which screening results are compared with laboratory results.

The SAP must be the framework of all anticipated field activities (e.g., sampling objectives, evaluation of existing data, standard operating procedures) and contain specific information on each round of field sampling and analysis work (e.g., sampling locations and rationale, sample numbers and rationale, analyses of samples). During the RD/RA, the SAP shall be revised as necessary to cover each round of field or laboratory activities. Revisions or a

statement regarding the need for revisions shall be included in each deliverable describing all new field work.

- The SAP shall allow for notifying EPA, at a minimum, **four weeks** before field sampling or monitoring activities commence. The SAP shall also allow split, replicate, or duplicate samples to be taken by EPA (or their contractor personnel), CT DEP, and by other parties approved by EPA. At the request of EPA or CT DEP, the Settling Defendants shall provide these samples in appropriately pre-cleaned containers to the government representatives. Identical procedures shall be used to collect the Settling Defendants and the parallel samples unless otherwise specified by EPA or CT DEP. Several references shall be used to develop the SAP, for example:
- Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (OSWER Directive 9355.3-01, EPA/540/G-89/004), October 1988
- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Pub. SW-846), Third Edition, and subsequent updates or revisions
- EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5 (EPA/240/B-01/003), March 2001
- Region 1, EPA-New England Quality Assurance Project Plan Program Guidance, April 2005
- Region 1, EPA-New England Compendium of Quality Assurance Project Plan Requirements and Guidance, October 1999
- Guidance on Systematic Planning using the Data Quality Objectives Process, EPA QA/G-4 (EPA/240/B-06/001), February 2006
- Data Quality Objectives Decision Error Feasibility Trials Software (DEFT) – User’s Guide, EPA QA/G-4D (EPA/240/B-01-007), September 2001
- Systematic Planning: A Case Study for Hazardous Waste Site Investigations, EPA QA/CS-1 (EPA/240/B-06/004), February 2006
- Guidance for Preparing Standard Operating Procedures (SOPs), EPA QA/G-6 (EPA/600/B-07/001), April 2007

- Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses, Revised, December 1996
- Data Quality Assessment: A Reviewer's Guide, EPA QA/G-9R (EPA/240/B-06/002), February 2006
- Data Quality Assessment: Statistical Methods for Practitioners, EPA QA/G-9S (EPA/240/B-06/003), February 2006
- Guidance for Quality Assurance Project Plans, EPA QA/G-5 (EPA/240/R-02/009), December 2002
- EPA Requirements for Quality Management Plans, EPA QA/R-2 (EPA 240/B-01/002), March 2001
- Guidance for Geospatial Data Quality Assurance Project Plans, EPA QA/G-5G (EPA/240/R-03/003), March 2003
- Guidance for Quality Assurance Project Plans for Modeling, EPA QA/G-5M (EPA/240/R-02/007), December 2002
- Guidance for Choosing a Sampling Design for Environmental Data Collection, EPA QA/G-5S (EPA/240/R-02/005), December 2002
- Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA 625/R-96/D10b), January 1999
- A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems (EPA 600/R-08-003), January 2008

These guidance documents and other useful information such as examples of QAPPs and streamlined QAPP tables can be found on the national EPA website ([http://www.epa.gov/quality/qa\\_docs.html#EPArqts](http://www.epa.gov/quality/qa_docs.html#EPArqts)) and/or the regional EPA New England website (<http://www.epa.gov/region1/lab/qa/qualsys.html>).

### B.1 Quality Assurance Project Plan (QAPP)

The Quality Assurance Project Plan (QAPP) shall document in writing site-specific objectives, policies, organizations, functional activities, and specific quality assurance/quality control activities designed to achieve the data quality objectives

(DQO's) of the RD/RA. The QAPP developed for this project shall document quality control and quality assurance policies, procedure, routines, and specifications.

Project activities throughout the RD/RA shall comply with the QAPP. QAPP sampling and analysis objectives and procedures shall be consistent with EPA Requirements QAPP for Environmental Data Operations (“EPA QA/R-5”) and appropriate EPA handbooks, manuals, and guidelines including Guidance for Quality Assurance Project Plans (“EPA/G-5”), Region I, EPA-New England Quality Assurance Project Plan Program Guidance, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (“SW-846”), Guidelines Establishing Test Procedures for the Analysis of Pollutants (40 CFR, Part 136), and Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air.

All the QAPP elements identified in EPA QA/R-5 and EPA QA/G-5 must be addressed. If a particular element is not relevant to a project and therefore excluded from the QAPP, specific and detailed reasons for exclusion must be provided.

Information in a plan other than the QAPP may be cross-referenced clearly in the QAPP provided that all objectives, procedures, and rationales in the documents are consistent, and the reference material fulfills requirements of EPA/QA/R-5. Examples of how this cross-reference might be accomplished can be found in the Guidance on Systematic Planning using the Data Quality Objectives Process and Data Quality Objectives Decision Error Feasibility Trials (DEFT) Software User’s Guide. EPA-approved references, or equivalent, or alternative methods approved by EPA will be used, and their corresponding EPA-approved guidelines should be applied when they are available and applicable.

#### 1) Laboratory Quality Assurance/Quality Control (QA/QC) Procedures

The QA/QC procedures and standard operating procedures (SOPs) for any laboratory (both fixed and mobile) used during the RD/RA shall be included in the Respondents’ QAPP. Prior to the use of any laboratory, the Respondents shall demonstrate, to EPA’s satisfaction, that each laboratory it may use is qualified to conduct the proposed laboratory work. The proposed laboratory’s use of methods and analytical protocols for the chemicals of concern in the media of interest within detection and quantification limits will be consistent with both QA/QC procedures and DQOs approved in the QAPP for the Site by EPA. The proposed laboratory must have and follow an approved QA program. If a laboratory that does not participate in the Contract Laboratory Program (CLP) is proposed, methods consistent with CLP methods that would be used at this Site for the purposes proposed, and QA/QC procedures approved by EPA, shall be used. The Respondents shall use only laboratories that have a documented Quality Assurance Program that complies with ANSI/ASQC E4, Specifications and Guidelines for Quality

Systems for Environmental Data Collection and Environmental Technology Programs (American National Standard, January 5, 1995), and EPA Requirements for Quality Management Plans, or equivalent documentation, as determined by EPA. EPA may require that the Respondents submit detailed information to demonstrate that the laboratory is qualified to conduct the proposed work, including information on personnel qualifications, equipment and material specifications.

When this work is performed by a contractor to a private party, each laboratory performing chemical analyses shall meet the following requirements:

- a) be approved by the State Laboratory Evaluation Program, if available;
- b) have successful performance in one of EPA's National Proficiency Sample Programs (i.e., Water Supply or Water Pollution Studies or the State's proficiency sampling program);
- c) be familiar with the requirements of 48 CFR Part 1546 contract requirements for quality assurance; and
- d) have a QAPP for the laboratory including all relevant analysis. This plan shall be referenced as part of the contractor's QAPP.

## 2) Data Validation Procedures

The Respondents are required to certify that a representative portion of the data has been validated by a person independent of the laboratory according to the Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses Revised December 1996 (amended as necessary to account for the differences between the approved analytical methods for the project and the current CLP Statements of Work (CLP SOW)). A data validation reporting package as described in the guidelines cited above must be delivered at the request of the EPA project manager. Approved validation methods shall be contained in the QAPP.

The independent validator shall not be the laboratory conducting the analysis and should be a person with a working knowledge of, or prior experience with, EPA data validation procedures. The independent validator shall certify that the data have been validated, discrepancies have been resolved to the maximum extent possible, and the appropriate qualifiers have been provided

### 3) Data Package Requirements

The Respondents must require and keep the complete data package, and, make it available to EPA on request in order for EPA to conduct an independent validation of the data. The complete data package shall consist of all results, all raw data, and all relevant QA/QC information. The forms contained in the data validation functional guidelines must be utilized to report the data when applicable. Raw data includes the associated chromatograms and the instrument printouts with area and height peak results. The peaks in all standards and samples must be labeled. The concentration of all standards analyzed with the amount injected must be included. All laboratory tracking information must also be included in the data package.

Analytical samples will be tested using published USEPA methods, including SW-846 methods, CLP SOWs, Standard Methods (American Public Health Association), USEPA Methods for Chemical Analysis of Water or Waste Water, USEPA Clean Water Act Methods, USEPA Drinking Water Methods, and/or other USEPA published methods. To the extent EPA determines that published methods are not sufficient or available to address specific Site conditions (i.e., complex chemical matrix or need for lower detection limits), the Respondents shall propose modifications to existing methods, or alternative methods, for approval by EPA.

Whether or not a CLP laboratory is used to analyze data, all deliverables required under the current CLP SOW must be delivered. An example CLP-like set of data package deliverables is as follows:

- a) a summary of positive results and detection limits of non-detects with all raw data;
- b) tabulated surrogate recoveries and QC limits from appropriate methods and all validation and sample raw data;
- c) tabulated matrix spike/matrix spike duplicate recoveries, relative percent differences, spike concentrations, and QC limits from appropriate methods and all validation and sample raw data;
- d) associated blanks (trip, equipment, and method with accompanying raw data for tests);
- e) tabulated initial and continuing calibration results (concentrations, calibration factors or relative response factors and mean relative response factors, percent differences and percent relative standard deviations) with accompanying raw data;

- f) tabulated retention time windows for each column;
- g) a record of the daily analytical scheme (run logbook, instrument logbook) which includes samples and standards order of analysis;
- h) the chain of custody for the sample shipment groups, DAS packing slip, DAS analytical specifications;
- i) a narrative summary of method and any problems encountered during extraction or analysis;
- j) tabulated sample weights, volumes, and percent solids used in each sample calculation;
- k) example calculation for positive values and detection limits; and
- l) validation data for all tests.

The forms contained in Chapter 1 of SW-846 or the current CLP SOW forms must be utilized to report the data when applicable. Raw data includes the associated chromatograms and the instrument printouts with area and height peak results. The peaks in all standards and samples must be labeled. The concentration of all standards analyzed with the amount injected must be included. Customized data reporting forms for sample results and QC results may be provided in deliverable packages provided they contain the information listed above. A reduced deliverable package may be designated for some samples when no data validation is scheduled and data quality objectives of the sample collection task do not include contamination and risk evaluation. This may include waste samples tested for disposal decisions or other testing not directly impacting RD/RA decisions. The Respondents shall provide full data deliverable packages upon request by the EPA Remedial Project Manager (RPM). All internal and external laboratory sample tracking information must be included in the data package.

## B.2 Field Sampling Plan (FSP)

The objective of the Field Sampling Plan is to provide EPA and all parties involved with the collection and use of field data with a common written understanding of all field work. The FSP should be written so that a field sampling team unfamiliar with the Site would be able to gather the samples and field information required. Guidance for the selection of field methods, sampling procedures, and custody can be acquired from the Compendium of Superfund Field Operations Methods (OSWER Directive 9355.0-14, EPA/540/P-87/001),



December 1987, which is a compilation of demonstrated field techniques that have been used during remedial response activities at hazardous waste sites. The FSP shall be site-specific and shall include the following elements:

Site Background. If the analysis of the existing Site details is not included in the Work Plan or in the QAPP, it must be included in the FSP. This analysis shall include a description of the Site and surrounding areas and a discussion of known and suspected contaminant sources, probable transport pathways, and other information about the Site. The analysis shall also include descriptions of specific data gaps and ways in which sampling is designed to fill those gaps. Including this discussion in the FSP will help orient the sampling team in the field.

Sampling Objectives. Specific objectives of sampling effort that describe the intended uses of data must be clearly and succinctly stated.

Sampling Location and Frequency. This section of the FSP identifies each matrix to be collected and the constituents to be analyzed. Tables shall be used to clearly identify the number of samples, the type of sample (water, soil, etc.), and the number of quality control samples (duplicates, trip blanks, equipment blanks, etc.). Figures shall be included to show the locations of existing or proposed sample points.

Sample Designation. A sample numbering system shall be established for the project. The sample designation should include the sample or well number, the sample round, the sample matrix (e.g., surface soil, ground water, soil boring), and the name of the Site.

Sampling Equipment and Procedures. Sampling procedures must be clearly written. Step-by-step instructions for each type of sampling that are necessary to enable the field team to gather data that will meet the Data Quality Objectives (DQOs). A list should include the equipment to be used and the material composition (e.g., Teflon, stainless steel) of equipment along with decontamination procedures.

Sampling Handling and Analysis. A table shall be included that identifies sample preservation methods, types of sampling jars, shipping requirements, and holding times. Examples of paperwork such as traffic reports, chain-of-custody forms, packing slips, and sample tags filled out for each sample as well as instructions for filling out the paperwork must be included. Field documentation methods including field notebooks and photographs shall be described.

#### C. Health and Safety Plan (HSP)

The objective of the site-specific Health and Safety Plan is to establish the procedures, personnel responsibilities and training necessary to protect the health and safety of all on-site

personnel during the RD/RA. The plan shall provide for routine but hazardous field activities and for unexpected Site emergencies.

The site-specific health and safety requirements and procedures in the HSP shall be updated based on an ongoing assessment of Site conditions, including the most current information on each medium. For each field task during the RD/RA, the HSP shall identify:

1. possible problems and hazards and their solutions;
2. environmental surveillance measures;
3. specifications for protective clothing;
4. the appropriate level of respiratory protection;
5. the rationale for selecting that level; and
6. criteria, procedures, and mechanisms for upgrading the level of protection and for suspending activity, if necessary.

The HSP shall also include the delineation of exclusion areas on a map and in the field. The HSP shall describe the on-site person responsible for implementing the HSP for the Settling Defendants representatives at the Site, protective equipment personnel decontamination procedures, and medical surveillance. The following documents shall be consulted:

1. Interim Standard Operations Safety Guides (Hazardous Response Support Division, Office of Emergency and Remedial Response EPA, Wash. D.C. 1982);
2. Superfund Public Health Evaluation Manual (OSWER Directive 9285.41, EPA/540/1-861060, EPA 1986);
3. Hazardous Waste Operations and Emergency Response (Department of Labor, Occupational Safety and Health Administration, (OSHA) 29 CFR Part 1910); and
4. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities: Appendix B (NIOSH/OSHA/EPA 1986).

OSHA regulations at 40 CFR 1910 and Chapter 9 of the Interim Standard Operating Safety Guide, which describes the routine emergency provisions of a site-specific health and safety plan, shall be the primary reference used by the Settling Defendants in developing and implementing the Health and Safety Plan.

The measures in the HSP shall be developed and implemented to ensure compliance with all applicable state and Federal occupational health and safety regulations. The HSP shall be updated at the request of EPA during the course of the RD/RA and as necessary.

#### D. Community Relations Support Plan (CRSP)

EPA shall develop a revised Community Relations Support Plan (CRP) to describe public information and public involvement activities anticipated during the RD/RA and delisting. The Settling Defendants shall also develop a CRSP, whose objective is to ensure and specify adequate support from the Settling Defendants for the community relations efforts of EPA. This support shall be at the request of EPA and may include:

1. participation in public informational or technical meetings, including the provision of presentations, logistical support, visual aids and equipment;
2. publication and copying of fact sheets or updates; and
3. assistance in preparing a responsiveness summary after the public RD/RA comment period;
4. assistance in placing EPA public notices in print.