

ARCADIS

**Remedial Design Work Plan
Attachment J**

**Vapor Control System
Evaluation**

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

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SRSNE Site Group

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Vapor Control System Evaluation

SRSNE Superfund Site
Southington, Connecticut

I. Purpose and Scope

This document has been prepared on behalf of the SRSNE Site Group, an unincorporated association of Settling Defendants to a Consent Decree (CD) and Statement of Work (SOW) for the Remedial Design/Remedial Action (RD/RA) at the Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site in Southington, Connecticut (Site). The CD was lodged on October 30, 2008 with the United States District Court for the District of Connecticut in connection with Civil Actions No. 3:08cv1509 (SRU) and No. 3:08cv1504 (WWE). The CD was entered by the Court on March 26, 2009.

This *Vapor Control System Evaluation* has been prepared to address the requirements of Section V.C.1.j of the SOW, which requires that the *Remedial Design Work Plan* (RDWP) include provisions for an “evaluation to determine whether (or not) a vapor control system is needed below the cap.” As further discussed below, the cap is a planned component of the remedial approach for the Site, and is to be constructed in the former SRSNE Operations Area after completing the in-situ thermal remediation (ISTR) component of the remedy. The ISTR component of the remedy will be performed to address overburden soils in the former Operations Area and adjacent railroad right-of-way, where non-aqueous phase liquid (NAPL) has been observed in overburden soils. The preliminary ISTR treatment area and cap limits – both of which are subject to potential modification as a result of planned remedial design activities – are shown on Figure J-1.

As stated on Page 94 of the Record of Decision (ROD), “Based on current data, EPA does not believe that a vapor control system will be a necessary component of the multi-layer cap. However, further analysis of this issue will be performed during pre-design.” Accordingly, the purpose of the vapor control system evaluation is to assess the potential for vapor emission or accumulation beneath the cap components that could lead to concerns associated with cap stability or vapor accumulation to the extent that a vapor collection, control, and/or venting system is warranted. In addition, the potential for migration of volatiles in soil gas to surrounding areas will be considered. As prescribed by the SOW, this evaluation will be performed after implementation of the ISTR activities. This will allow the evaluation to be conducted in consideration of available information regarding the degree and effectiveness of the ISTR component, including post-ISTR residual concentrations of volatile organic compounds (VOCs).

Subsequent portions of this document summarize proposed remedial actions that are pertinent to this evaluation, identify the proposed approach and factors to be considered when conducting the evaluation, and present the anticipated schedule for implementing the evaluation. If, based on the results of this evaluation, the United States Environmental Protection Agency (USEPA) determines that a vapor control system is needed, such a system will be incorporated into the detailed design of the multi-layer cap.

Vapor Control System Evaluation

SRSNE Superfund Site
Southington, Connecticut

II. Proposed Remedial Activities Affecting the Vapor Control System Evaluation

The selected remedial approach for the Site was specified in the ROD (USEPA 2005) and summarized in Section III of the SOW. Pertinent to this evaluation, the selected remedial approach includes:

- Design, construction, and operation of an in-situ thermal treatment system to treat the Overburden NAPL Area (Figure J-1).
- Design and construct a low-permeability, multi-layer, composite cap over contaminated soil in the former Operations Area and along the railroad right-of-way. The cap will be consistent with Resource Conservation and Recovery Act (RCRA) "C" cap requirements and requirements of the Connecticut Remediation Standard Regulations (RSRs).

The ISTR component is pertinent to the vapor control system evaluation because ISTR implementation will substantially alter the composition of the area to be capped. Specifically, the ROD estimates that ISTR implementation will remove 95 to 99% of VOCs within the treatment zone (ROD Page 90). In addition, ISTR implementation will involve sampling of soils within the treatment area to confirm that SOW-specified performance standards are achieved. This will provide a dataset indicating the types, concentrations, and distribution of VOCs, if any, that remain in the overburden soils at the completion of ISTR. Because such VOCs are likely to be the primary source of soil gas vapors after implementing ISTR, the soil sampling data will be significant to the vapor control system evaluation.

The cap component is pertinent because, if the USEPA concludes that a vapor system is necessary, provisions for such a system must be incorporated into the design of the cap. This may affect the specific cap materials, components, and thickness, and, therefore, is a key factor in completing the design of the cap.

III. Approach

A key factor in assessing the potential need for a vapor control system as part of the cap will be the specific conditions that exist within the former Operations Area following ISTR. This will, in large part, be driven by the results of soil sampling performed to confirm the completion and effectiveness of ISTR operations. Such sampling will provide an indication of the types, concentrations, and distribution of VOCs that remain in the overburden soils at the completion of ISTR. Other pertinent factors may include the topography, degree of crowning in the cap area, the continued presence of NAPL in the bedrock zone beneath the cap area, and the results of other sampling that may be performed as part of remedial design and ISTR implementation (e.g., soil sampling to confirm the cap limits, as required by SOW Section V.C.1.i.).

Vapor Control System Evaluation

SRSNE Superfund Site
Southington, Connecticut

Based on the conditions and data that exist following ISTR implementation, the evaluation of the potential need for a vapor control system will consider the following:

- The extent to which USEPA requires further operation of the ISTR system after a demonstration that applicable performance standards have been met¹
- Chemical and physical properties of the primary residual VOCs in overburden soils (e.g., Henry's law constant and diffusivities)
- The potential for gas generation (e.g., methane) due to biodegradation of residual VOCs or other carbon sources that may be present
- The unlined nature of the cap area, and the resulting limitation on potential for pressurized gas accumulation
- The planned slope and degree of crown for the cap components, which will affect the potential for accumulation of gasses beneath the cap components and the ability for gasses to migrate beyond the cap limits
- The final extent of the cap and the nature of additional soils that may be consolidated beneath it
- Potential for lateral migration of soil vapors beyond the cap limits, and the proximity of nearby receptors
- The type and permeability of the capped soils, and the associated degree to which vapors can migrate laterally within the matrix
- Cap stability and factor of safety for cap with and without vapor collection system
- Applicable guidance and/or technical papers available at the time

¹ Per Section IV.A.4 of the SOW, the USEPA has the discretion to require further operation of the ISTR system after a SOW-specified Interim NAPL Cleanup Levels are achieved if USEPA determines that appreciable amounts of NAPL continue to be recovered.

Vapor Control System Evaluation

SRSNE Superfund Site
Southington, Connecticut

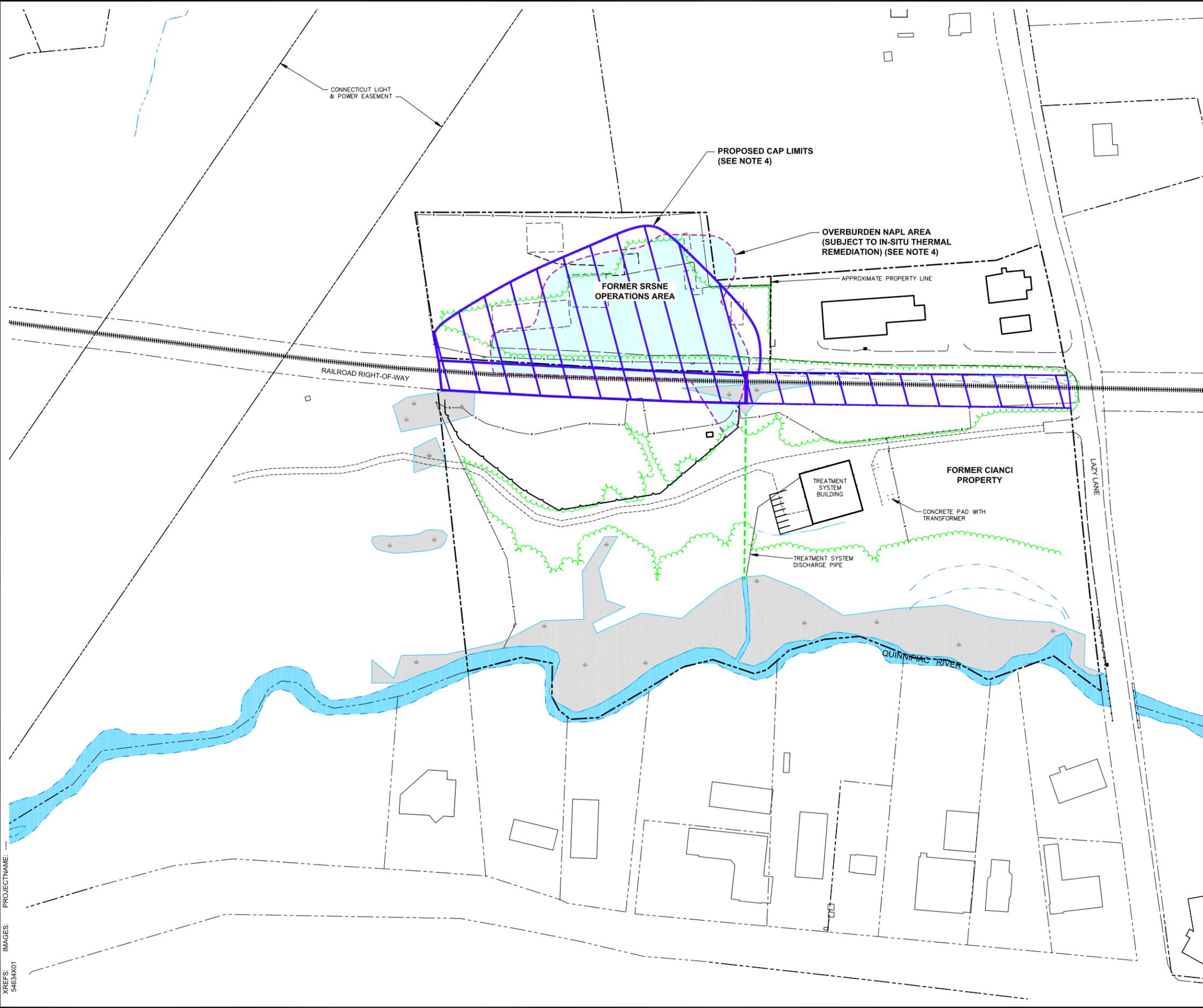
Given that a robust dataset representative of post-ISTR site conditions will exist at the time that the evaluation is performed, additional data collection specific to this evaluation is not anticipated. However, numerical modeling (e.g., Johnson and Ettinger modeling) will be performed, as needed, to facilitate the evaluations described above. In the unanticipated event that data collection is necessary, the *Sampling and Analysis Plan* (Attachments B and C to the *Remedial Design Project Operations Plan*) includes procedures that could be employed for additional field sampling in support of this evaluation (e.g., soil sampling and soil gas sampling).

IV. Reporting and Schedule

The results of the vapor control system evaluation will be provided in a brief summary report to be presented to the USEPA within 90 days after completion of the ISTR activities. The report will summarize the evaluation process and include a recommendation regarding the need for a vapor control system as a component of the cap. Pending USEPA's concurrence with or modification of that recommendation, information will be available to proceed with the final design of the cap area.

Figure

CITY: SYRACUSE DIV/PROJECT: ENV/CAD DB: PGL/LAF/GMS LD/Op1 PIC: G CAMERON PM: J HOLDEN TM: J HOLDEN LVR: ON=OFF=REF CONCRETE IFLOODPLAIN
 G: ENV/CAD/SYRACUSE/ACT180054634/00001000000/DWG/RD/WP/5463406.DWG LAYOUT: J-1 SAVED: 3/12/2009 2:36 PM ACADVER: 17.05 (LMS TECH) PAGESETUP: C-LD2B-PDF-TABLOID PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/26/2009 8:39 AM BY: STOWELL, GARY
 XREFS: 54634X01
 PROJECTNAME: ...



LEGEND:

- PROPERTY LINE
- - - - - PROPERTY LINE - ADJOINER
- ▭ BUILDING
- ▭ BUILDING - ADJOINER
- - - - - FORMER BUILDING
- ▬ RAILROAD
- ▬ ROAD
- - - - - GRAVEL ROAD
- - - - - DRAINAGE SWALE
- ▬ RIVER
- - - - - EASEMENT
- - - - - CHAINLINK FENCE
- - - - - SHEETPILE
- ~ ~ ~ TREELINE
- ▬ BOLLARD
- ▬ WETLAND

- NOTES:**
1. 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.
 2. BENCHMARK #1 IS AT ELEVATION 164.03. PK NAIL; S'LY SIDE; POLE #9049.
 3. WETLAND AREAS WERE TAKEN FROM THE FINAL REMEDIAL INVESTIGATION REPORT (HNUS, MAY 1994).
 4. THE LIMITS OF REMEDIAL ACTIVITIES ARE PRELIMINARY, AND ARE SUBJECT TO CONFIRMATION/MODIFICATION BASED ON REMEDIAL DESIGN ACTIVITIES.



SRSNE SUPERFUND SITE
SOUTHTON, CONNECTICUT
VAPOR CONTROL SYSTEM EVALUATION

PRELIMINARY ISTR TREATMENT
AREA AND CAP LIMITS

FIGURE
J-1