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REPORT

~~*Draft*~~ FINAL *NTCRA 2 100% Ground-Water System Design Report*

Solvents Recovery Service of New England Site
Southington, Connecticut

Prepared For:
SRSNE PRP Group

November 1999

Approved 6/5/01 with clarifications in BBL Letter dated 5/30/01

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

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Transmitted Via Facsimile/U.S. Mail

May 30, 2001

Ms. Karen Lumino
USEPA, Region I
JFK Federal Building (HBO)
Boston, MA 02203-0001

Re: SRSNE Site – Southington, Connecticut
Responses to USEPA Comments Regarding
Draft NTCRA 2 100% Groundwater System Design Report
BBL Project #: 1041.08331 #2

Dear Ms. Lumino:

This letter presents responses to the United States Environmental Protection Agency's (USEPA's) comments regarding the Draft NTCRA 2 100% Ground-Water System Design Report (BBL, November 1999) for the Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site in Southington, Connecticut. USEPA's comments, which we understand included input by the Connecticut Department of Environmental Protection (CT DEP), were presented in an e-mail dated May 14, 2001, to the SRSNE Site Potentially Responsible Party (PRP) Group. In the letter, USEPA indicated that it is prepared to conditionally approve the Draft NTCRA 2 100% Ground-Water System Design Report, subject to the conditions discussed below.

Blasland, Bouck & Lee, Inc. (BBL), discussed the comments and BBL's proposed responses during a telephone conversation with USEPA's hydrogeologic consultant, TetraTech NUS (TtNUS), on May 22, 2001. The results of that discussion provide the basis for the responses documented below.

Comment 1: *Design Report, section 1.3.1, page 1-2, first bullet: The SOW states that the performance standard shall be to implement a containment system that minimizes the migration of all "contaminated bedrock groundwater" from the Operations Area. The report does not include the word "contaminated" which could indicate that all groundwater, clean and contaminated, would have to be intercepted. This performance standard also appears in Appendix C, Section 1.3, page 1-1.*

Response 1: In accordance with the SOW, the performance standard is to implement a containment system that minimizes the migration of all "contaminated bedrock groundwater" from the Operations Area. The word "contaminated" will be added the two text bullets cited in this comment, one in the main report and the other in Appendix C.

Comment 2: *Design Report, section 3.3.4, page 3-3. The final design report should present the elevations each of the level probes.*

Response 2: BBL discussed this matter during the telephone conversation with TtNUS on May 22, 2001. The compliance criteria are based on groundwater elevation (head) measurements at a select network of monitoring wells, rather than the elevations of the level probes inside the NTCRA 2 extraction wells. BBL agrees with TtNUS, however, that it is useful to establish a maximum water level elevation for the normal operating range at extraction wells RW-1R and RW-13 to maintain a specified amount of drawdown inside each well.

As such, during normal operating, the water level goal at both of the extraction wells will be as follows:

- Average operating water elevation 125 ft above mean sea level (maximum);
- Average operating water depth 25 feet below ground surface minimum; and
- Drawdown of approximately 20 feet or more.

It should be noted that the water level inside each well will be maintained within a specified operating range controlled by a transducer (RW-13) or float switches (at RW-1R). The position of that operating range will be situated appropriately to meet the goals stated above.

Comment 3: *Appendix C, section 2, page 2-1. The test for demonstration of compliance should specify the magnitude of the inward gradients. The final Design Report should include some numerical value for the head differences in the upper and lower bedrock and the upper bedrock and overburden. Use data that has been collected since the system has been in operation for 2 years to determine an appropriate number.*

Response 3: As TtNUS and BBL discussed on May 22, 2001, the complete NTCRA 2 groundwater containment system is not currently operating. The SRSNE Site PRP Group has been voluntarily operating the overburden groundwater extraction well (RW-13) since July 1999, but the pump and controls have not yet been installed into NTCRA 2 bedrock extraction well RW-1R. The start-up of the NTCRA 2 bedrock well will occur in accordance with the NTCRA 2 Implementation Schedule, which will be prepared and submitted to USEPA following the approval of the NTCRA 2 100% Ground-Water System Design Report.

TtNUS and BBL agreed that the appropriate head difference required to meet the demonstration of compliance will be 0.3 feet, which is consistent with the NTCRA 1 demonstration of compliance requirement. Thus, the demonstration of compliance will be considered achieved when the head measurements at bedrock wells MW-704R and MW-704DR are at least 0.3 feet lower than the other, corresponding monitoring wells to be monitored as part of the NTCRA 2 demonstration of compliance.

As BBL clarified to TtNUS, the available data from pumping tests indicate that operation of the two extraction wells will result in a downward hydraulic gradient between the deep overburden and the shallow bedrock at the MW-704 monitoring well cluster. The overburden extraction well, RW-13, is connected directly to the top of bedrock. Thus, well RW-13 also extracts shallow bedrock groundwater, in addition to

middle and deep overburden groundwater. In fact, well RW-13 creates more drawdown in the shallow bedrock than in the overburden at the MW-704 monitoring well cluster. This situation creates a "top" to the bedrock groundwater containment area. Furthermore, any incidental upward flow of bedrock groundwater into the overburden in that area would be contained by the overburden pumping well and should not be construed as a "loss of containment". Since the pumping wells will operate with level controls, any rise in the water table or potentiometric surface will result in a larger effective drawdown at each pumping well relative to the static, non-pumping level. TtNUS and BBL agreed that overburden head measurements are unnecessary for demonstrating bedrock groundwater containment.

Comment 4: *Appendix C, section 2, page 2-2. The term "lower" used for the containment test should be quantified. This should be based on data collected over the past 2 years of the system's operation.*

Response 4: Please refer to Response 3, above.

Comment 5: *Appendix C, section 3.2, page 3-1. Deep overburden wells in the area of NTCRA 2 should be included to get a handle on the vertical gradients between the bedrock and the overburden. The concern is that during spring high groundwater conditions, the zone of capture in the overburden may be reduced which will results in a smaller capture area in the bedrock. This could potentially happen even with a horizontal reversal of gradient. There may be data available to indicate this is not necessary. This issue should be discussed before the final Design Report is completed.*

Response 5: TtNUS and BBL discussed this issue on May 22, 2001 and concluded that the available data indicate that this is not necessary, as discussed above in Response 3.

As the USEPA clarified to the PRP Group in an E-mail dated May 16, 2001, TtNUS suggested that the following wells be added to the monitoring program:

- Shallow bedrock wells P-8A and MW-708R; and
- Deep bedrock wells MW-702DR and MW-708DR.

Wells P-8A and MW-702DR are in the southwestern corner of the Operations Area. The MW-708 well cluster is in the cemetery east of Queen Street. These wells are proposed to provide more information regarding the lateral extent of the capture zone. These wells will be added to the Demonstration of Compliance, Containment Test #1 on Page 2-1 of the NTCRA 2 Demonstration of Compliance Plan.

Comment 6: *Appendix C, data collection schedules. These may be modified based on the data that has already been collected during the past 2 years of system operation.*

Response 6: We understand that USEPA offered this comment so that the PRP Group would not have to collect redundant data. However, because the NTCRA 2 groundwater containment system is not currently operating, the data collection schedule described in the Demonstration of Compliance Plan is appropriate.

Schedule

The Group will submit the NTCRA 2 Implementation Schedule to USEPA within 14 days of approval of the NTCRA 2 100% Ground-Water System Design Report. The Group is currently obtaining a contractor to complete bedrock pumping well RW-1R. Given that the resolution to the comments discussed above results in minimal changes to the document, the Group proposes that this letter serve as an addendum to the draft NTCRA 2 100% Ground-Water System Design Report, and that the draft report be considered final with approval of this addendum. This approach is consistent with the draft NTCRA 2 Technical Memorandum, which was completed by a letter addendum responding to USEPA comments.

We trust this information meets your needs. Pending USEPA's approval of these responses, the PRP Group will prepare and submit the NTCRA 2 Implementation Schedule and expedite system start-up. If you have any questions, please do not hesitate to call Mr. Bruce Thompson of de maximis, inc., at (860) 651-1196.

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Gary R. Cameron/mbg

Gary R. Cameron
Vice President

MJG/GRC/mbg

cc: Mike Beskind, CT DEP
Liyang Chu, TetraTech, NUS
Bill Morris, United Industrial Services
Bruce R. Thompson, de maximis, inc.
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Michael J. Gefell, P.G., Blasland, Bouck & Lee, Inc.

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1. Introduction

1.1 General

This report presents the 100% Design for a second Non-Time-Critical Removal Action (NTCRA 2) for bedrock ground-water containment and treatment at the Solvent Recovery Services of New England (SRSNE) Site in Southington, Connecticut (Figure 1). This 100% Design Report was prepared on behalf of the SRSNE Potentially Responsible Party (PRP) Group.

On July 20, 1996, the SRSNE PRP Group entered into an Administrative Order on Consent (Consent Order) with the United States Environmental Protection Agency (USEPA) for this NTCRA (Docket No. I-97-1000). Included as Appendix A of the Order is a Statement of Work (SOW) that defines the NTCRA 2 response activities and deliverables that the SRSNE PRP Group is obligated to complete pursuant to the Order. The activities described in the SOW are based upon the USEPA Action Memorandum for the SRSNE Site signed by the acting USEPA Region I Administrator on June 1, 1995.

NTCRA 2 , as described in the SOW, consists of the following components:

1. The design and implementation of a bedrock ground-water containment system to prevent migration of bedrock ground water from the SRSNE Site, with presumed treatment using the existing on-site ground-water treatment system installed in 1995 as part of NTCRA 1; and

2. The demolition of buildings and tanks, and capping of the former SRSNE Operations Area.

This 100% Design Report, which specifically addresses the first component of NTCRA 2, has been prepared in accordance with the requirements of the SOW. The remaining buildings and tanks in the Operations Area were removed in July and August 1999 as the second component of the NTCRA 2 work. The Operations Area is currently fenced, and most of the soil is paved with asphalt or concrete. That cover will remain in place until a final remedy is selected and implemented.

1.2 Site Background

The SRSNE Site is located on approximately 14 acres of land adjacent to Lazy Lane in the town of Southington, Connecticut (Figure 1). The current property was developed as two distinct areas with separate operating histories. A portion of the property was used as a hazardous waste treatment, storage and disposal facility (TSDF). This portion of the SRSNE Site is on the west side of the Boston and Maine (B&M) railroad tracks and is identified as the "Operations Area" throughout this document. The remaining portion of the SRSNE Site lying to the east of the railroad tracks and west of the Quinnipiac River was used by Cianci Construction Company for storage of construction equipment and for truck washing from 1969 to 1988. This area is identified as the "former Cianci property" throughout this document. Both of these areas are shown on the Site Plan (Figure 2).

SRSNE started processing used solvents in 1955 and continued through 1990. The large volume of solvents processed at the site (at least 41 million gallons), and the primary delivery in 55-gallon drums, led to many spills and other accidental releases during thirty-seven years of site operations. Investigation of releases at the SRSNE Site started in 1978. A total of 15 different investigations and 7 remedial actions have been completed to date by the Town of Southington, Connecticut Department of Environmental Protection (CT DEP), USEPA, SRSNE (under enforcement order) and the PRPs (under administrative orders on consent). The primary contaminants of concern

are volatile organic compounds (VOCs), including chlorinated alkanes and alkenes, aromatics, ketones, furans, and alcohols.

Solvents have been recovered as non-aqueous phase liquids (NAPLs) from wells screened in the overburden in the Operations Area and in the overburden or bedrock in the southern portion of the former Cianci property. Migration of overburden ground water from the Operations Area was controlled with the NTCRA 1 Ground-Water Containment and Treatment System, which started operation in July 1995. This system consists of 12 overburden ground-water extraction wells pumping at a combined long-term average of 18 gallons per minute (gpm), located behind 700 linear feet of interlocking steel sheetpile wall driven to bedrock (25 to 32 feet deep) within the NTCRA 1 Containment Area shown on Figure 2. The NTCRA 1 Containment System has maintained hydraulic control of overburden ground water for over 99 percent of its first four years of operation and also contains the majority of the impacted bedrock ground water migrating from the Operations Area.

Ground water pumped from the NTCRA 1 containment system is treated in the NTCRA 1 treatment system building situated north of the NTCRA 1 Containment Area. Treatment includes removing naturally occurring iron and manganese, followed by ultraviolet (UV) oxidation, which uses hydrogen peroxide and high intensity UV lamps to degrade the solvents in the pumped water. Granular activated carbon (GAC) filtering removes residual hydrogen peroxide and solvents. Treated water is discharged to the Quinnipiac River. The system has been operated reliably and consistently by the PRPs since July 1995, pumping over 40,000,000 gallons of water and removing over 7,500 pounds of solvent contamination.

Pumping from another overburden ground-water extraction well (RW-13, see Figure 3) was started in July 1999 to initiate containment of bedrock groundwater. Pumping from the NTCRA 1 wells and RW-13 will continue with treatment in the NTCRA 1 system, which was designed and constructed with excess capacity for this possibility. In addition, bedrock ground-water extraction well RW-1R will be added to the NTCRA 2 Containment System as described in this 100% Design Report.

1.3 Overview of Non-Time-Critical Removal Action

The Action Memorandum signed on June 1, 1995, describes the purposes for NTCRA 2, including the design and implementation of a ground-water extraction system to minimize the migration of ground water in the bedrock from the Operations Area of the site. The NTCRA 2 SOW assumes that the ground water extracted by the NTCRA 2 containment system will be treated using the treatment system that was designed and constructed for NTCRA 1, which is located on the former Cianci property. As presented in Appendix B to the Draft Feasibility Study (FS) Report (BBL, November 1998a) and in this 100% Design Report, the available data indicate that the NTCRA 1 treatment system is capable of effectively treating the ground water that will be discharged from the NTCRA 2 containment system. In addition, the SRSNE PRP Group is evaluating alternative treatment technologies for the water that will be pumped from the NTCRA 2 containment system. The objectives of the NTCRA 2 containment system will be to meet specific performance standards specified by the SOW.

1.3.1 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 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. It is expected that 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. 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 VOCs above Federal Maximum Contaminant Levels (MCLs) in bedrock downgradient of the NTCRA 1 bedrock ground-water containment area (Figure 3).

- *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.* The NTCRA 2 Demonstration of Compliance Plan is included as Appendix C to this 100% Design Report. While ground-water flow in fractured bedrock 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 Appendix A to this document, the bedrock ground-water containment area can be delineated using empirical hydraulic head measurements. The Containment Area shown on Figure 3 will be monitored with select wells and piezometers in the shallow and deep bedrock.

- *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 and 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 down-time 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.

These containment system performance standards provide the overall objectives for the NTCRA 2 ground-water containment system. Bedrock ground-water containment will be achieved using ground-water extraction wells RW-13 and RW-1R (see Figure 3).

1.3.2 Design Investigation Performance Standards

The Design Investigation performance standards specified by the SOW require that sufficient information be obtained for USEPA to determine:

- The effect of the existing NTCRA 1 containment system on bedrock ground water;

- The pumping rates, duration, number, location (including depth), and specifications (diameter, type of sandpack, length of screen) for any wells needed for the NTCRA 2 ground-water containment system;

- The effect of the NTCRA 2 system on wetlands and floodplains that might be impacted by ground-water pumping;
- The effect of the NTCRA 2 system on private water-supply wells in the vicinity of the site; and
- The extent of the bedrock containment area.

The information listed above was obtained during the NTCRA 2 Design Investigation and presented in detail in Appendix B to the Draft FS Report (BBL, November 1998a) and the NTCRA 2 Technical Memorandum (BBL, November 1998b).

1.4 Report Organization

Following this introductory section, Section 2.0 presents a description of the pre-design activities, as supported by Appendix A, and the ground-water containment system basis of design. Section 3.0 further describes the ground-water containment and treatment system basis of design. Appendix B presents the Scope of Work, including Plans and Specifications. Appendix C contains the NTCRA 2 Demonstration of Compliance Plan, which describes how the containment system performance standards listed in the SOW will be achieved, maintained, and demonstrated.

2. Pre-Design Activities

2.1 General

This section provides the basis of design for the bedrock ground-water containment system, and describes the testing and technical evaluations that support the selected containment system. The NTCRA 2 Ground-Water Containment System will consist of overburden ground-water extraction well RW-13 and bedrock ground-water extraction well RW-1R (see Figure 3).

2.2 Ground-Water Containment System Installation and Preliminary Testing

As part of the NTCRA 2 design investigation, bedrock pumping well RW-1R and a network of seven bedrock piezometers [PZR series within the Connecticut Light & Power (CL&P) easement] were installed at the approximate locations shown on Figure 3. BBL also installed overburden pumping well RW-13 and eight overburden piezometers, and completed a one-week overburden pumping test to help support the evaluation of ground-water remedial alternatives as part of the FS. The overburden pumping test implementation and results, which were described in detail in Appendix B to the Draft FS Report and summarized in Section 3 of the NTCRA 2 Technical Memorandum, indicated that overburden pumping well RW-13 had a substantial hydraulic influence in the overburden and the shallow and deep bedrock. The bedrock ground-water containment area achieved by overburden pumping well RW-13, in conjunction with the bedrock ground-water containment provided by the twelve NTCRA 1 ground-water extraction wells, meets the NTCRA 2 objectives as defined in the SOW.

In lieu of the planned bedrock pumping test included in the NTCRA 2 Design and Study Process, and to provide additional data to confirm the interpreted bedrock ground-water containment area established by overburden pumping well RW-13, an Interim Ground-Water Containment Evaluation was performed, as described in Appendix A. Overburden pumping well RW-13 and bedrock pumping well RW-1R were both pumped during the Interim Ground-Water Containment Evaluation to assess the potential for well RW-1R to further enhance deep bedrock ground-water containment.

2.2.1 Extraction Well and Piezometer Installation and Development

Bedrock ground-water extraction well RW-1R was installed at the location shown on Figure 3 by East Coast-Thomas Environmental, Inc. between December 18, 1997, and January 5, 1998. The top of bedrock at pumping well RW-1R was encountered 76 feet below ground surface. Extraction well RW-1R includes a 12-inch-diameter, permanent, black steel casing through the overburden and grouted into the top 6 feet of bedrock (total depth of 82 feet), and a 12-inch-diameter open bedrock borehole from 82 feet below grade to a total depth of approximately 173 feet (97 feet into the bedrock) (Table 1). Extraction well RW-1R was developed by surging and pumping for approximately one week.

Overburden ground-water extraction well RW-13 was installed by East-Coast Thomas Environmental between July 14 and 16, 1998. The RW-13 borehole was advanced to the top of bedrock at approximately 78 feet below grade. The extraction well was constructed using a 40-foot length of 8-inch-diameter, continuous-wound, 0.030-inch slot, #304 stainless steel screen placed within the middle and deep overburden zones (depth interval of 35 to 75 feet below grade), and an 8-inch-diameter, Schedule 80 polyvinyl chloride (PVC) riser pipe (Table 1). Extraction well RW-13 was developed by surging using an approximately 8-inch-diameter surge block, pumping with a submersible pump, and jetting using air. Eight overburden piezometers were also installed as part of the same mobilization.

Between October 28 and December 4, 1997, seven bedrock piezometers (PZR series) were installed by East Coast-Thomas Environmental in the CL&P easement at the locations shown on Figure 3. The bedrock piezometers were installed to provide hydraulic response data during pumping test activities and NTCRA 2 implementation. Five shallow bedrock and two deep bedrock piezometers were selected to fill data gaps in the bedrock monitoring array, particularly in the area downgradient of bedrock pumping well RW-1R. The designation for the new piezometers is as follows (see locations on Figure 3):

- Shallow Bedrock Piezometers -- PZR-1R, PZR-2R, PZR-3R, PZR-4R, and PZR-5R; and
- Deep Bedrock Piezometers -- PZR-2DR and PZR-4DR.

Shallow and deep bedrock piezometers were installed to depths of approximately 25 feet and 90 feet below the top of bedrock, respectively. The piezometers were developed by surging and pumping, and a specific capacity test was completed at each piezometer.

Extraction well and bedrock piezometer construction details are summarized in Table 1. The NTCRA 2 Technical Memorandum (BBL, November 1998b) provided a more detailed discussion of the installation and development of bedrock extraction well RW-1R and the seven bedrock piezometers. Appendix B to the Draft FS Report (BBL, November 1998a) provided a more detailed description of the installation and development of overburden extraction well RW-13.

2.2.2 Pumping Tests

The NTCRA 2 Design and Study process called for a bedrock pumping test to provide data required to support the design of the NTCRA 2 bedrock ground-water containment system. A pumping test was completed at overburden extraction well RW-13 between August 17 and 24, 1998, and demonstrated significant hydraulic influence in the overburden and bedrock. The hydraulic responses measured during the pumping test showed that overburden extraction well RW-13, in combination with the twelve extraction wells associated with existing NTCRA 1 Containment System, achieved the bedrock containment requirements of the NTCRA 2 SOW. Appendix B to the Draft FS Report (BBL, November 1998a) presented the results of the well RW-13 pumping test in detail.

To further enhance the hydraulic containment effectiveness of overburden extraction well RW-13, bedrock extraction well RW-1R will be added to the NTCRA 2 Ground-Water Containment System. As proposed in the NTCRA 2 Technical Memorandum (BBL, November 1998b), the combined effect of wells RW-13 and RW-1R was tested during an Interim Ground-Water Containment Evaluation between July 14 and 28, 1999. Appendix A presents the results of the combined test of both extraction wells, which indicated that well RW-1R further enhanced the NTCRA 2 Containment Area. As described in Appendix A, the Containment Area achieved during steady-state pumping from extraction wells RW-13 and RW-1R encompasses the majority of the northern portion of the Town of Southington Well Field Property, the Operations Area, and the former Cianci property. The Containment Area extends south to near the southern edge of the CL&P easement and east beyond the Quinnipiac River. Recent ground-water sampling results from monitoring wells in the Town Well Field Property suggest that the NTCRA 2 Containment Area will contain all bedrock ground water exceeding Federal MCLs (BBL, July 1999). Prior to the Interim Ground-Water Containment Evaluation, overburden pumping well RW-13 was connected to the NTCRA 1 treatment system via a permanent trench installation including an electrical wire and discharge pipe. Well RW-13 has continued to operate from July 1999 to the present.

2.2.3 Ground-Water Modeling

Ground-water flow modeling was performed in two phases during the NTCRA 2 design and study process. During the first phase, a ground-water flow (MODFLOW) model was developed based on published hydrogeologic data and the information obtained during the RI (BBL, June 1998). The model was calibrated and simulations were performed to predict the appropriate depth, size, location, and pumping rate of the NTCRA 2 bedrock ground-water extraction well to hydraulically contain the off-site VOC plume in bedrock. The results of ground-water flow model development were described in the NTCRA 2 Interim Technical Memorandum (BBL, September 1997). Based on the preliminary modeling results, bedrock ground-water extraction well RW-1R and seven bedrock piezometers were installed as described above.

In the second phase, the MODFLOW model was refined based on the results of the pumping test at overburden extraction well RW-13. The model was then used to simulate the containment area achieved in the overburden and bedrock formations by overburden pumping well RW-13. The simulated containment area compared favorably with hydraulic head data measured during the pumping test, as presented in Appendix B to the Draft FS Report (BBL, November 1998a). The simulated downgradient extent of the ground-water containment area achieved by pumping

well RW-13 compared closely to the calculated, theoretical location of the stagnation point (which defines the extent of the containment area downgradient of a pumping well). Also, the simulated containment area effected by well RW-13 in the overburden and bedrock correlate well with the overall head distributions measured during the pumping test. As presented in Appendix A, adding bedrock extraction well RW-1R to the ground-water containment system will further enhance the NTCRA 2 Containment Area.

2.3 Ground-Water Containment System Operation

Electrical power and a discharge pipe were permanently installed between well RW-13 and the NTCRA 1 treatment building in June and July 1999. During the NTCRA 2 implementation, bedrock pumping well RW-1R will be connected to the existing electrical supply and well RW-13.

During NTCRA 2 Ground-Water Containment System operation, extraction wells RW-13 and RW-1R will operate automatically. Level control switches will maintain an approximately constant drawdown in either well. Ground water will be pumped from bedrock well RW-1R at an average rate less than 1 gpm. Overburden well RW-13 will continue to operate at a long-term average rate expected to be in the range of 15 to 20 gpm. The combined discharge from well RW-1R and well RW-13 will be pumped to the NTCRA 1 treatment system for treatment and discharge to the Quinnipiac River. Sampling performed during the Interim Ground-Water Containment Evaluation indicated that the NTCRA 1 treatment system can effectively treat the water pumped from wells RW-13 and RW-1R (Table 2).

3. Ground-Water Containment and Treatment System Design

3.1 General

This section outlines the basis of design of the NTCRA 2 ground-water containment and treatment system. Included in this section is a description of the basis of key design conditions such as treatment system design flow rate, influent concentrations, and target effluent concentrations. Also included is a brief description of the existing ground-water containment and treatment system.

3.2 Ground-Water Influent Concentrations and Treatment Objectives

The original system design influent concentration, actual influent concentrations before overburden extraction well RW-13 was started, influent concentrations during RW-13 and RW-1R pumping test, actual influent concentrations after overburden well RW-13 was started, and the target effluent concentrations are presented in Table 1. The development of the influent basis of design concentrations were discussed in detail in the NTCRA 100% Ground-Water Containment and Treatment System Design Report (BBL, December 1994).

The actual treatment system influent concentrations from January 1 to July 7, 1999 presented on Table 2 were the highest detected concentration from samples collected for the SRSNE NTCRA 1 Demonstration of Compliance Reports (DCRs) during that period. Overburden extraction well RW-13 was not operational through that period.

RW-13 and RW-1R pumping test concentrations presented on Table 2 were the highest detected concentrations from samples collected during the pumping test of the two new wells in July 1999.

The actual treatment system influent concentrations from July 14 to September 22, 1999 presented on Table 2 were the highest concentration from samples collected for the SRSNE NTCRA 1 DCR No. 40 (Third quarter of 1999) after the overburden extraction well RW-13 was started.

As shown in Table 2, ground water from overburden extraction well RW-13 and bedrock extraction well RW-1R contains significantly lower concentrations of VOCs, alcohols, ketones, and metals than the existing to NTCRA 1 influent (prior to RW-13 start-up). The addition of ground-water from overburden extraction well RW-13 and bedrock extraction well RW-1R will not impact the ability of the NTCRA 1 treatment system to effectively treat the water pumped from the NTCRA 1 containment system.

3.3 System Components

3.3.1 General

This section provides a detailed description and basis of design for overburden extraction well RW-13 and bedrock extraction well RW-1R. The existing NTCRA 1 ground-water containment and treatment systems are described in detail in NTCRA 100% Ground-Water Containment and Treatment System Design Report (BBL, December 1994).

3.3.2 Ground-Water Containment System Overview

The existing ground-water containment system for NTCRA 1 consists of a series of 12 vertical recovery wells and a downgradient hydraulic barrier (i.e., sheet-piling). The water collected from the Containment Area is pumped to the ground-water treatment system located in a treatment system building. The water is first collected in a 10,000-gallon flow equalization tank, from which it is pumped through a metals pretreatment system to remove suspended solids and metals. Following metals pretreatment, the water is treated to remove organic compounds using an enhanced oxidation treatment system, followed by a liquid-phase GAC treatment system to remove residual peroxide from the enhanced oxidation process. The treated water is discharged to the Quinnipiac River.

The new 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. 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) predicted that a hydraulic divide will be established downgradient (south) of the extraction wells during the implementation of the ground-water containment system.

Overburden extraction well RW-13 and bedrock ground-water extraction well RW-1R will be located downgradient of the existing NTCRA 1 Containment Area. Due to the low flow rate required from RW-1R (<1 gpm), water collected from RW-1R will be pumped into RW-13. Water collected from the two wells will then be pumped from RW-13 to the NTCRA 1 ground-water treatment system. The ground-water treatment system is currently running at less than 20% of its original design flow rate of 100 gpm; therefore, the additional 15 to 20 gpm from the two new extraction wells will not exceed the design flow rate.

3.3.3 Ground-Water Containment System Components

The new ground-water containment system consists of one overburden extraction well (RW-13) and one bedrock extraction well (RW-1R).

Overburden extraction well RW-13 extends to a depth of approximately 75 feet below grade. The well is 8-inches in diameter and has a 40-foot long screen placed within the middle and deep overburden zones (Table 1).

Bedrock extraction well RW-1R has a total depth of approximately 173 feet below grade. The top of bedrock was encountered 76 feet below ground surface. The extraction well includes a 12-inch-diameter steel casing through the overburden and grouted into the top 6 feet of bedrock (Table 1).

Due to the low flow rate from well RW-1R (<1gpm), the submersible well pump at well RW-1R will pump water to RW-13. The submersible well pump at RW-13 is connected to a common header leading to the ground-water treatment system.

Equipment

Well Pump - RW-13 (Existing)

Quantity:	1
Manufacturer:	Grundfos
Type:	Submersible Environmental
Flow Rate:	30 gpm at 110 feet total dynamic head (TDH)
Electrical:	1½ HP, 230 volt, single-phase

Well Pump - RW-1R (New)

Quantity:	1
Manufacturer:	Grundfos
Type:	Submersible Environmental
Flow Rate:	7 gpm at 90 feet TDH
Electrical:	½ HP, 230 volt, single-phase

Controls/Alarms

A. Controls

1. Remote interlock in treatment system building
2. Well level controls to control pump operation

3. Interlock to prevent well pump startup on Equalization tank high level
4. Interlock to prevent RW-1R startup if RW-13 is not running

B. Alarms

1. High level light for each well
2. Autodialer alarm for high level in RW-13

3.3.4 Ground-Water Containment and Treatment System Operation

The existing 12 vertical recovery wells immediately upgradient of the sheet-pile wall will continue to collect ground water from the NTCRA 1 area as originally designed.

Overburden extraction well RW-13 and bedrock extraction well RW-1R will pump as needed to maintain the level in each well. Due to the low flow rate, RW-1R will pump into RW-13 rather than directly into the common header to the treatment building. Water collected from both wells will be pumped from RW-13 to the existing NTCRA 1 ground-water treatment system. RW-1R will be interlocked to not operate if RW-13 is not pumping. Neither well pump will operate if a high level is detected in the treatment system equalization tank. If a high level in RW-13 is detected, the system will trigger the existing autodialer notification system to notify the appropriate operating personnel.

Water collected from the original 12 NTCRA 1 wells and the two NTCRA 2 wells will be pumped to the NTCRA 1 treatment system, which consists of metals pretreatment, enhanced oxidation treatment, liquid-phase GAC treatment, and air treatment. Metals pretreatment includes the following steps:

1. Flow equalization
2. pH adjustment
3. Polymer addition in a rapid mix chamber
4. Flocculation in a slow mix chamber
5. Clarification and sludge removal
6. Sand filtration
7. Readjustment of pH

Following pH adjustment back to approximately 7.0, the water is oxidized using hydrogen peroxide and ultraviolet (UV) light radiation. Then liquid-phase GAC is used to remove any residual organic compounds and peroxide. Finally, the vapor phase from all the treatment steps is collected and treated in vapor-phase GAC units. If the treatment system detects conditions outside the range of routine activities, appropriate operating personnel are notified via an autodialer notification system.

4. References

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

Blasland, Bouck & Lee, Inc. "Remedial Investigation Report." Solvents Recovery Service of New England Site, June 1998.

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.

TABLES

TABLE 1

SRSNE SITE
NTCRA 2 100% GROUND-WATER SYSTEM DESIGN

DRAFT

WELL AND PIEZOMETER CONSTRUCTION DATA

Location	Easting (X)	Northing (Y)	Ground Surf. Elev. (1929 NGVD)	Meas. Pt. (Top of Well) Elevation	Meas. Pt. Stickup	Depth to Top of Till	Depth to Top of Bedrock	Borehole Diameter (Inches) *	Total Well Depth from Stickup	Depth to Bottom of Borehole	Depth to Top of Bentonite	Depth to Bottom of Bentonite	Type of Sandpack Material	Depth to Top of Sandpack	Depth to Bottom of Sandpack	Screen/ Sump Material	Screen Length	Screen Diameter (Inches)	Screen Slot Size (Inches)	Depth to Top of Screen	Depth to Bottom of Screen	Sump Length	Depth to Top of Sump	Depth to Bottom of Sump	Riser Material	Riser Diameter (Inches)	Well Formation
PZR-1R	565721.5	285403.8	148.72	151.07	2.35	NA	98	8.25 & 4.0	125.7	125.5	2	101.5	Morie #0	101.5	125.5	Sch40 PVC	20.0	2	0.010	103.0	123.0	0.3	123.0	123.3	Sch40 PVC	2	Shallow Bedrock
PZR-2R	565562.5	285330.5	152.10	153.77	1.67	70	113	8.25 & 4.0	142.5	141.5	2	118.7	Morie #0	118.7	141.5	Sch40 PVC	20.0	2	0.010	120.5	140.5	0.3	140.5	140.8	Sch40 PVC	2	Shallow Bedrock
PZR-2DR	565579.3	285318.7	153.41	154.92	1.51	70	113	8.25 & 4.0	205.8	205.0	2	181.5	Morie #0	181.5	205.0	Sch40 PVC	20.0	2	0.010	184.0	204.0	0.3	204.0	204.3	Sch40 PVC	2	Deep Bedrock
PZR-3R	565745.3	285219.9	149.92	152.39	2.47	84	114	8.25 & 3.0	143.1	141.0	2	119.5	Morie #0	119.5	141.0	Sch40 PVC	20.0	2	0.010	120.3	140.3	0.3	140.3	140.6	Sch40 PVC	2	Shallow Bedrock
PZR-4R	565368.6	285470.6	152.36	153.95	1.59	NA	64	8.25 & 4.0	91.6	95.0	2	68.5	Morie #0	68.5	95.0	Sch40 PVC	20.0	2	0.010	69.7	89.7	0.3	89.7	90.0	Sch40 PVC	2	Shallow Bedrock
PZR-4DR	565388.3	285463.6	151.15	153.25	2.10	NA	64	8.25 & 4.0	157.4	156.0	2	132.7	Morie #0	132.7	156.0	Sch40 PVC	20.0	2	0.010	135.0	155.0	0.3	155.0	155.3	Sch40 PVC	2	Deep Bedrock
PZR-5R	565279.8	285532.2	152.12	154.84	2.72	NA	47	8.25 & 4.0	76.0	75.2	2	52	Morie #0	52.0	75.2	Sch40 PVC	20.0	2	0.010	53.0	73.0	0.3	73.0	73.3	Sch40 PVC	2	Shallow Bedrock
RW-1R	565570.6	285561.2	149.80	152.18	2.38	40	75	16 & 12	174.4	172.0	NA	NA	NA	NA	NA	Open Hole	90.0	12	NA	82.0	172.0	0.0	172.0	172.0	Black Steel	12	Shallow and Deep Bedrock
PZO-2M	565586.0	285328.1	152.70	154.81	2.11	70	113	8.25	58.4	70.0	2	44.0	Morie #0	44.0	58.0	Sch40 PVC	10.0	2	0.010	46.0	56.0	0.3	56.0	56.3	Sch40 PVC	2	Middle Overburden
PZO-2D	565578.2	285339.8	152.48	154.29	1.81	70	113	8.25 & 4.0	87.1	119.0	2	70.0	Morie #0	70.0	86.0	Sch40 PVC	10.0	2	0.010	75.0	85.0	0.3	85.0	85.3	Sch40 PVC	2	Deep Overburden
PZO-3M	565736.4	285211.5	150.59	152.58	1.99	84	114	8.25	58.3	58.0	2	44.0	Morie #0	44.0	58.0	Sch40 PVC	10.0	2	0.010	46.0	56.0	0.3	56.0	56.3	Sch40 PVC	2	Middle Overburden
PZO-3D	565726.3	285209.5	150.85	153.13	2.28	84	114	8.25 & 4.0	100.6	102.0	2	83.0	Morie #0	83.0	102.0	Sch40 PVC	10.0	2	0.010	88.0	98.0	0.3	98.0	98.3	Sch40 PVC	2	Deep Overburden
PZO-6S	565487.1	285569.1	151.28	153.07	1.79	40	75	8.25	24.1	23.0	2	10.0	Morie #0	10.0	23.0	Sch40 PVC	10.0	2	0.010	12.0	22.0	0.3	22.0	22.3	Sch40 PVC	2	Shallow Overburden
PZO-121S	565547.3	285819.6	150.14	152.14	2.00	54	58	8.25	14.0	12.0	1	1.5	Morie #0	1.5	12.0	Sch40 PVC	10.0	2	0.010	1.7	11.7	0.3	11.7	12.0	Sch40 PVC	2	Shallow Overburden
PZO-204S	565649.2	285564.9	149.06	151.16	2.10	79	82	8.25	15.1	13.0	1	2.0	Morie #0	2.0	13.0	Sch40 PVC	10.0	2	0.010	2.7	12.7	0.3	12.7	13.0	Sch40 PVC	2	Shallow Overburden
PZO-204M	565658.0	285561.9	149.18	151.16	1.98	79	82	8.25	58.0	58.0	2	44.0	Morie #0	44.0	56.0	Sch40 PVC	10.0	2	0.010	45.7	55.7	0.3	55.7	56.0	Sch40 PVC	2	Middle Overburden
RW-13	565560.2	285601.7	150.12	149.51	-0.61	40	75	16	74.4	77.8	27	30.0	Morie #1	30.0	77.8	Sch80 SS	40.0	8	0.030	35.0	75.0	0.0	75.0	75.0	Sch80 PVC	8	Middle and Deep Overburden

1) NA - Not Available or Not Applicable
2) Measurements in feet except where noted otherwise. Elevations are in terms of feet above mean sea level (AMSL); the datum is the NGVD of 1929.
3) Wells/piezometers finished with neat cement grout above upper bentonite seal.
4) SS = Stainless steel; PVC = polyvinyl chloride

* Larger number indicates overburden borehole diameter; smaller number indicates bedrock borehole diameter or roller-bit diameter used in cobbly section of overburden.

Table 2

SRSNE Site
Southington, Connecticut

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Treatment System Basis of Design

Parameter	Original Basis of Design Treatment System Influent Concentration[1] (mg/L[2])	Actual Treatment System Influent Concentration Jan. 1, 1999 to July 7, 1999[3] (mg/L)	RW-13 and RW-1R Pump Testing Concentration[4] (mg/L)	Actual Treatment System Influent Concentration July 14, 1999 to Sept. 22, 1999[5] (mg/L)	Substantive Requirements Effluent Limits[6] (mg/L)
Average Flow Rate (gpm)	100	16.3	21	30	NA[7]
A. Organic Parameters					
Volatile Organic Compounds					
Trichloroethene	1.3	0.12	0.003	0.058	0.973
Tetrachloroethene	0.58	<0.1	<0.001	<0.1	0.106
Toluene	16	16	<0.001	5.3	4.0
Ethylbenzene	8.5	5.6	<0.0003	2.1	1.0
Total xylenes	2.5	2.8	<0.0007	1.3	0.50
Vinyl chloride	2.8	3.5	<0.001	1.1	4.50
1,1-Dichloroethene	<0.58	0.18	<0.001	<0.1	0.06
Tetrahydrofuran	5.5	<5.0	0.083	<5.0	0.50
Cis-1,2-Dichloroethene	8.4	13	0.005	4.3	5.0
1,2-Dichloroethane	<0.58	<0.1	<0.0009	<0.1	0.25
1,1,1-Trichloroethane	2.5	3.3	<0.0008	0.28	4.0
1,1,2-Trichloroethane	<0.58	<0.1	<0.001	<0.1	0.25
Methylene chloride	3.0	0.53	0.011	0.057	15.0
Styrene	<0.58	<0.1	<0.0008	<0.1	0.50
Alcohols					
Ethanol	<1.0	<5	---[8]	<5	20.0
Methanol	1.4	<5	---	<5	30.0
2-Butanol (sec-Butanol)	57	<5	---	<5	10.0
2-Propanol (Isopropanol)	89	<5	---	<5	10.0
Ketones					
Acetone	36	0.55	<0.004	0.52	35.0
2-Butanone (Methyl Ethyl Ketone)	40	1.7	<0.003	<0.5	10.0
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	6	0.62	<0.002	<0.3	2.0
B. Inorganic Parameters					
Metals					
Copper, Total	0.06	<0.025	<0.01	<0.025	0.029[9]
Iron, Total	49	18	0.53	12.4	5.0
Lead, Total	0.082	<0.005	<0.003	<0.005	0.006[9]
Nickel, Total	0.07	<0.04	<0.02	<0.04	0.5
Zinc, Total	0.19	0.442	<0.01	0.383	0.074[9]

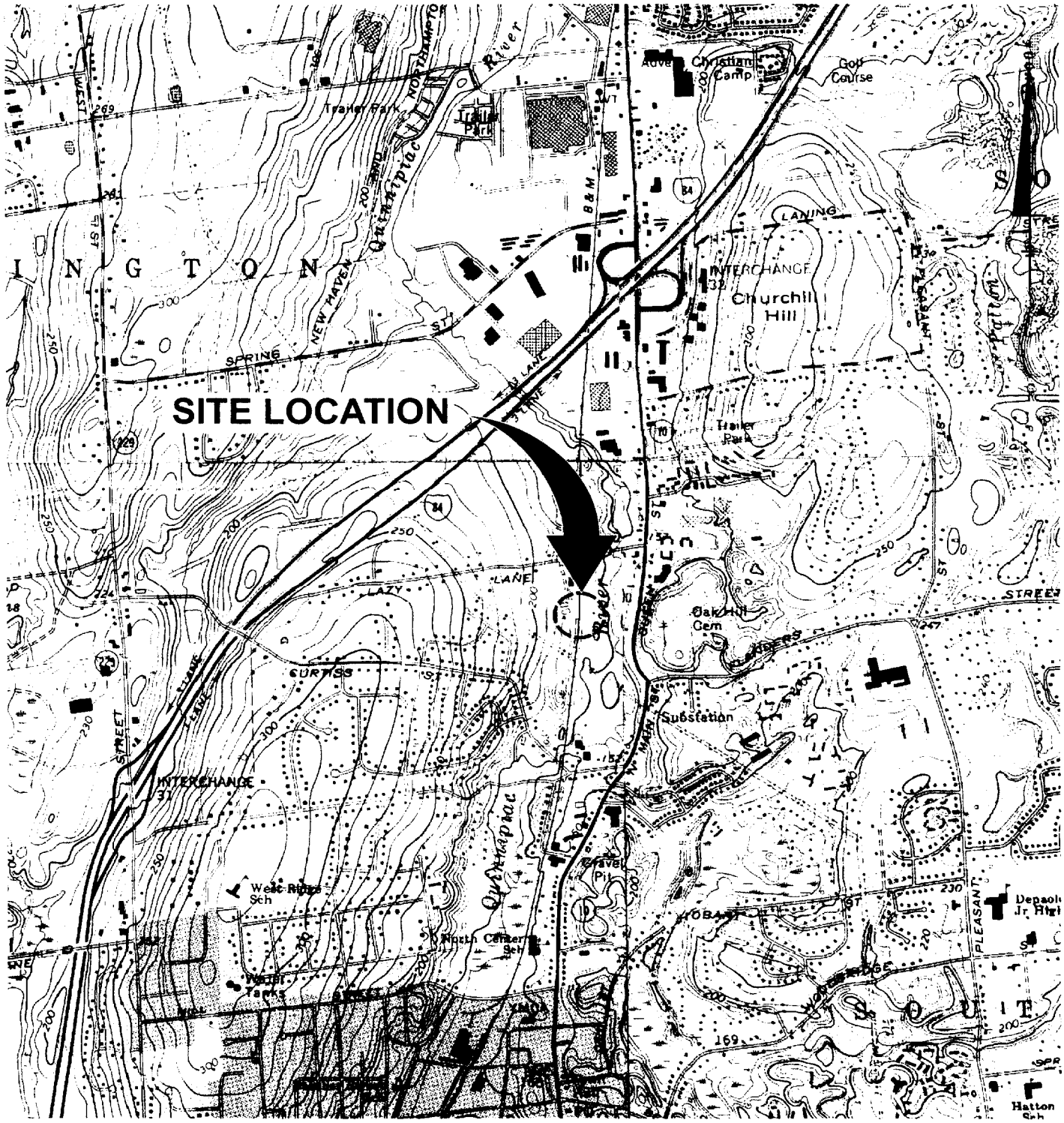
Table 2
(Cont'd)
SRSNE Site
Southington, Connecticut

DRAFT

Treatment System Basis of Design

[1] Original Basis of Design Treatment System Influent Concentrations from Non-Time-Critical Removal Action 100% Ground-Water Containment Treatment System Design Report (Blasland, Bouck & Lee, December 1994)
[2] mg/L = Milligrams per liter
[3] Actual Treatment System Influent Concentration 1/1/99 to 7/7/99 from Non-Time-Critical Removal Action No. 1 Demonstration of Compliance Report (DCR) #38 and #39 (Handex of New England, Inc., April 1999 and July 1999) and analysis spreadsheet for DCR #40
[4] RW-13 and RW-1R Pumping Test Concentrations from Galson Laboratories Analysis Report (August 1999)
[5] Actual Treatment System Influent Concentration 7/14/99 to 9/22/99 analysis spreadsheet for Non-Time-Critical Removal Action No. 1 DCR #40.
[6] Substantive Requirements Effluent Limits from Table 4 of Non-Time-Critical Removal Action No. 1 DCR #39 (Handex of New England, Inc., July 1999)
[7] NA = not applicable
[8] --- = no analysis
[9] Substantive Requirements Effluent Limits for copper, lead, and zinc shown in Table 4 of Non-Time-Critical Removal Action No. 1 DCR #39 (Handex of New England, Inc., July 1999) as grams per day. Converted to concentration assuming 100 gallons per minute flow.

FIGURES



REFERENCE: SOUTHINGTON, CONN. USGS QUAD. 1968 PR 1992, MERIIDAN, CONN. USGS QUAD. 1966 PR 1984, NEW BRITIAN, CONN. USGS QUAD. 1966 PR 1984, & BRISTOL, CONN. USGS QUAD 1967 PR 1984.

2000' 0 2000'

APPROX. SCALE: 1" = 2000'

Originals in color.

CONNECTICUT

QUADRANGLE LOCATION

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
NTCRA 2 100% DESIGN REPORT

SITE LOCATION MAP

DRAFT

10/99 SYR D54-DJH
08331012/08331N01.cdr

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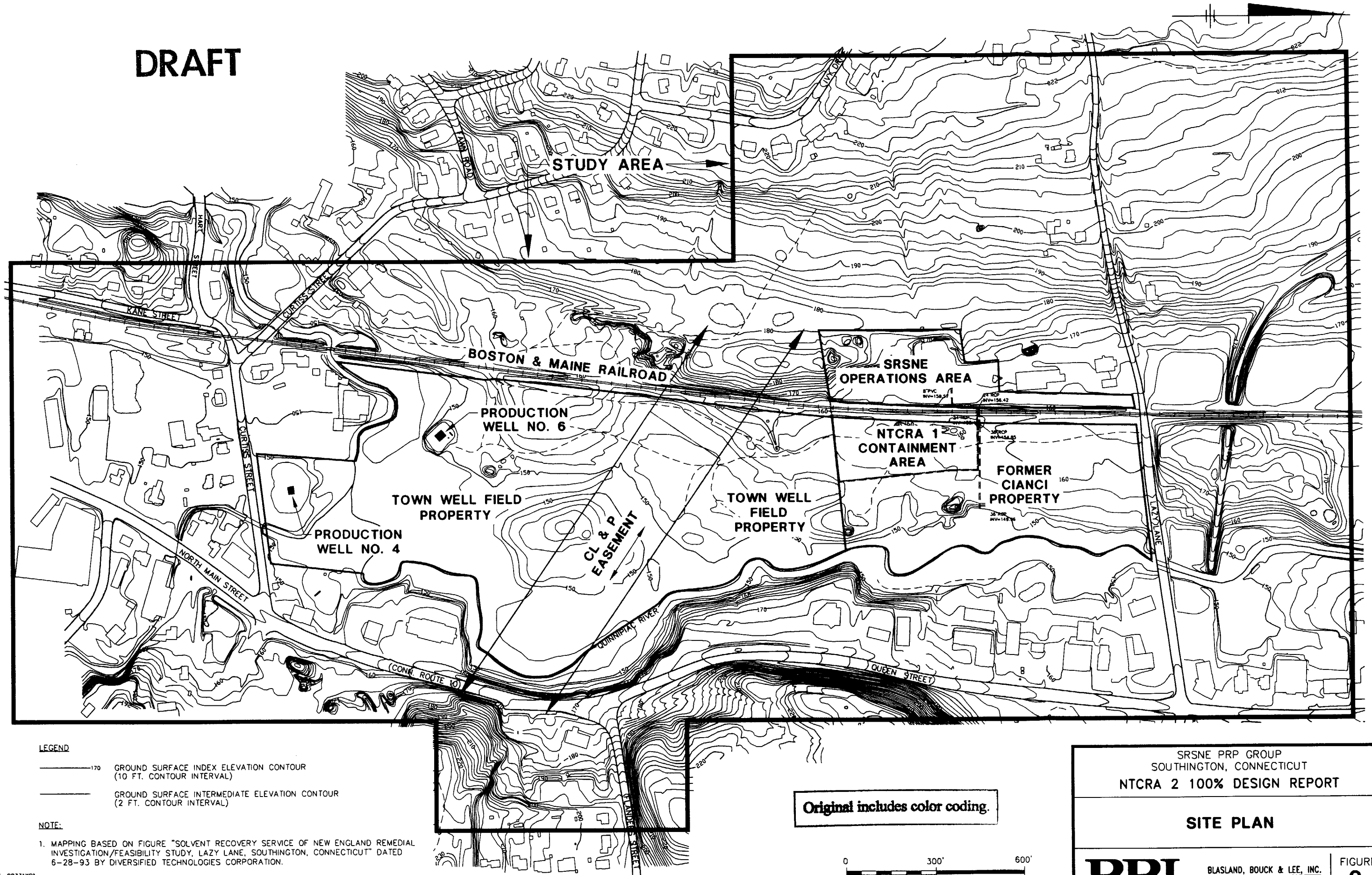
engineers & scientists

FIGURE 1

DRAFT



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, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

Original includes color coding.

0 300' 600'

X: 08331X01
L: ON=*,OFF=REF,COMPLIANCE
P: 0J808REF.PCP
10/13/99 SYR-54-CBM
08331012/08331G01.DWG

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
NTCRA 2 100% DESIGN REPORT

SITE PLAN

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 2

DRAFT

Original includes color coding.

ESTIMATED NTCRA 2 CONTAINMENT AREA BOUNDARIES IN SHALLOW BEDROCK AND DEEP BEDROCK

ESTIMATED NTCRA 1 BEDROCK CONTAINMENT AREA

OPERATIONS AREA

NTCRA 1 TREATMENT SYSTEM BUILDING

NTCRA 1 CONTAINMENT AREA

FORMER IDEAL FORGING

KANE STREET

HART STREET

CURTISS STREET

FAWN ROAD

IVY DRIVE

CL&P EASEMENT

NORTH MAIN STREET

INTERMITTENT STREAM

QUINNIPIAC RIVER

(CONN. ROUTE 10)

DOGEN STREET

LAZY LANE

FLANDERS STREET

MW-129 PZR-6 PZR-5 MW-701DR MW-209A TW-10 WE-6 PZR-7 TW-09 P-15 P-8A P-4A P-2A P-1A WE-3 MW-126C CPZ-2R CPZ-1R TW-08B CPZ-9R WE-1 CPZ-10R MW-128 MW-124C MW-416 MW-414 PW-406 MW-411 MW-408 MW-123A MW-01 MW-02 MW-703DR PZR-5R PZR-4R CPZ-7R CPZ-4R CPZ-8R CPZ-3R P-5A CPZ-5R MW-125A MW-125C P-5 CPZ-6R P-12A MW-703R MW-709DR MW-705R MW-705DR MW-127C PZR-2R MW-704DR RW-13 MW-121C PZR-2DR RW-1R MW-704R MW-121A MW-04 MW-205A MW-707R MW-707DR PZR-1R MW-204A MW-05 P-14 P-11A P-3A MW-706DR P-101A P-102A MW-207A MW-206A PZR-3R MW-501A MW-201A MW-202A MW-708DR MW-708R MW-203A

NOTE:

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

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)

0 300' 600'

X: 08331X02
P:STD-DL.PCP ● E-SIZE OR DJB.PCP
L: ON=*,OFF=REF,COMPLIANCE
10/15/99 SYR-54-CBM PGL KMD
08331012/08331G03.DWG

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SOUTHINGTON, CONNECTICUT
NTCRA 2 100% DESIGN REPORT

CONTAINMENT SYSTEM AND HEAD MONITORING LOCATIONS

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 3

Appendix A

Interim Ground-Water Containment Evaluation Results

Appendix A - Interim Ground-Water Containment Evaluation Results

A.1 General

This appendix presents the results of an Interim Ground-Water Containment Evaluation performed by Blasland, Bouck & Lee, Inc. (BBL) in support of the Non-Time-Critical Removal Action (NTCRA) 2 100% Ground-Water System Design for the Solvents Recovery Service of New England (SRSNE) Site in Southington, Connecticut. The investigation activities described herein were proposed in the NTCRA 2 Technical Memorandum (BBL, November 1998b), including field activities, data evaluation, and reporting.

A.1.1 Background and Objectives

Following the overburden pumping test at well RW-13 in August 1998, the SRSNE Potentially Responsible Party (PRP) Group proposed additional field activities to complete the NTCRA 2 design for bedrock ground-water containment (BBL, November 1998b). The overburden pumping test produced a substantial hydraulic response in the bedrock. The Interim Ground-Water Containment Evaluation served a similar role to the NTCRA 1 design investigation BBL performed between the completion of the NTCRA 1 Technical Memorandum (ENSR, June 1994) and the preparation of the NTCRA 1 100% Design Report (BBL, December 1994). The purpose for the Interim Ground-Water Containment Evaluation was to verify that the presumptive NTCRA 2 containment system design (well RW-13 and potentially RW-1R), would meet the NTCRA 2 Statement of Work (SOW) requirements. The Interim Ground-Water Containment Evaluation objectives were to:

- Obtain select pre-pumping ground-water elevation data;
- Operate well RW-13 continuously for a period of one week and obtain a comprehensive round of ground-water elevation measurements;
- Continue to operate well RW-13 and add pumping from well RW-1R continuously for a period of one week and obtain another comprehensive round of ground-water elevation measurements; and
- Continue to operate RW-13 and RW-1R while the ground-water elevation data are evaluated and discussed with United States Environmental Protection Agency (USEPA) and Connecticut Department of Environmental Protection (CT DEP). (Well RW-13 has continued to operate from July 1999 to the present; well RW-1R has not operated since July 1999, but it will be connected to the Containment System and started up as part of NTCRA 2 implementation).

A.1.2 Pumping System Installation

To convey pumped water to the NTCRA 1 treatment system during the Interim Ground-Water Containment Evaluation, a force main and electrical wire were installed in a trench from the NTCRA 1 treatment building to well RW-13 in June-July 1999. Specifications for the force main, electrical supply, well pumps, and controls (BBL, March 1999) were presented to USEPA on March 23, 1999. Further information regarding the pumping system is presented in Appendix B to the NTCRA 2 100% Ground-Water System Design Report.

A.1.3 NTCRA 1 Compliance Monitoring

NTCRA 1 compliance monitoring was performed throughout the Interim Ground-Water Containment Evaluation (July 14 through 28, 1999) as part of NTCRA 1 activities, and indicated that NTCRA 1 containment was maintained during the Interim Ground-Water Containment Evaluation.

A.2 NAPL Zone Gradient Monitoring

As with the overburden pumping test activities in August 1998, hydraulic gradients were monitored at select pairs of wells/piezometers within the potential non-aqueous phase liquid (NAPL) zones delineated during the completion of the Remedial Investigation (RI; BBL, June 1998). During the one week pumping test of well RW-13, which was completed between August 17 and 24, 1998, NAPL zone gradients were monitored throughout the test, up to and including the steady-state portion of the test. The results of that monitoring program indicated minimal change in the hydraulic gradients during pumping, as summarized in the NTCRA 2 Technical Memorandum (BBL, November 1998b). Based on those results, the NAPL zone gradient monitoring during the Interim Ground-Water Containment Evaluation was performed during the second pumping phase, when the influence of bedrock pumping well RW-1R was added to that of well RW-13.

NAPL zone gradient measurements were obtained starting on July 21, 1999, with RW-13 pumping but immediately before starting well RW-1R. Hydraulic gradients were monitored at the following pairs of piezometers within the NAPL zones (also see Figures A-1 and A-2). The number associated with each pair listed below is the maximum historical head differential measured at the pair, expressed as the head at the first location minus the head at the second location.

Bedrock Horizontal Gradient Monitoring (in Bedrock Potential NAPL Zone)

- P-6 and P-11A: 1.90 feet; and
- CPZ-3R and CPZ-4R: 2.60 feet.

The head differences at these monitoring pairs during the Interim Ground-Water Containment Evaluation were within the range of recorded data (Table A-1).

Overburden/Bedrock Vertical Gradient Monitoring (in Overburden Potential NAPL Zone)

- P-11B/P-11A: 0.37 feet (downward);
- MW-413/MW-414: 3.42 feet (downward); and
- CPZ-4/CPZ-4R: -0.04 feet (upward).

The head differences at monitoring pairs P-11B/P-11A and CPZ-4/CPZ-4R during the Interim Ground-Water Containment Evaluation were within the range of recorded data (Table A-2). The data measured at monitoring well cluster MW-413/MW-414 suggested a relatively high head difference condition that was evaluated during and after the completion of the test.

The maximum recorded head difference at well cluster MW-413/MW-414 before the test was 3.42 feet, as measured on six dates between November 14, 1994 and August 28, 1998. The head difference measured at this cluster was 2.00 feet on July 21, 1999, before the start-up of well RW-1R. On July 22, 1999, the head difference was measured as 3.60 feet. Based on this information, the continuous pumping rate at well RW-13 was reduced from approximately 25 gallons per minute (gpm) to 19 gpm as a cautionary measure, and the control switches at well RW-1R were raised to reduce the drawdown from approximately 40 feet to 20 feet. (Well RW-1R pumped discontinuously, as controlled by in-well float switches.) However, the reduction in pumping produced negligible reduction in the head difference at well cluster MW-413/MW-414, suggesting that the relatively high head difference at that cluster was not related to pumping from wells RW-13 and RW-1R. This inference was further evaluated during two recovery phases at the conclusion of the Interim Ground-Water Containment Evaluation. Well RW-1R was shut off at 15:10 on July 28, 1999 and well RW-13 was shut off at 18:35 on July 29, 1999. Following shut down of these wells, the head difference at well cluster MW-413/MW-414 remained relatively constant at 3.59 to 3.65 feet, and did not approach the pre-pumping head difference of 2.00 feet (this measurement, in retrospect, appears to have been obtained before the water level at well MW-414 equilibrated). The only NAPL zone monitoring locations that indicated a recovery response were wells P-11A and P-11B (0.2 feet each, with no relative gradient change between

them). A continuous hydrograph of the water level at well P-2A, located in the southeastern corner of the adjacent Operations Area, showed negligible response during the start-up or shut down of either pumping well (see Attachment A-1). These findings suggest that well RW-1R had minimal, if any influence on hydraulic gradients in the potential NAPL zones during the Interim Ground-Water Containment Evaluation.

Further data review was conducted to help assess the significance of the apparently anomalous head difference measured at well cluster MW-413/MW-414 (3.73 feet), as presented in Attachment A-2. This review indicates that the apparent exceedence of the maximum historical head difference at this pair of wells is likely an artifact of a limited historical data set. Wells MW-413, MW-414, and MW-415 are all within the same well cluster near the middle of the NTCRA 1 Containment Area. These well are screened in the deep overburden, shallow bedrock, and middle overburden, respectively. In comparison to the partial set of data (n = 6) considered for well cluster MW-413/MW-414, a more complete data set is available for well pair MW-415/MW-414, which has been monitored weekly since July 1995 as part of NTCRA 1 compliance monitoring (n = 210). The head difference during the Interim Ground-Water Containment Evaluation was also above the upper end of the head differences based on the partial data set for well pair MW-415/MW-414. However, the compliance data set for this pair indicates that the head difference during the Interim Ground-Water Containment Evaluation was well within the range of conditions observed historically. The high end of the head differences observed based on the compliance data set is approximately 0.8 feet higher than that for the partial data set at MW-415/MW-414. Similarly, it is likely that the head difference at wells MW-413/414 during the Interim Ground-Water Containment Evaluation (0.3 feet above the partial data set maximum) did not actually exceed the historical range of conditions.

In summary, the NAPL zone gradient monitoring results indicated minimal, if any, head changes associated with pumping from wells RW-13 and RW-1R, negligible recovery response after the shut down of both pumping wells, and head differences within the historic range of conditions.

A.3 Additional Ground-Water Elevation Monitoring

A.3.1 Water-Level Measurements Before Pumping

BBL obtained manual water level measurements immediately prior to pumping at the key bedrock wells/piezometers previously used to calculate the stagnation point location downgradient of extraction wells RW-13 and RW-1R (see Appendix B of the Draft FS Report), namely:

- Shallow Bedrock Wells/Piezometers--MW-704R, PZR-2R, and MW-707R; and
- Deep Bedrock Wells/Piezometers--MW-704DR, PZR-2DR, and MW-707DR.

These data provided a basis to interpolate the pre-pumping gradient, drawdown between measurement points, and stagnation point location during pumping (see Attachment A-3). BBL also installed pressure transducers and data loggers at these bedrock wells/piezometers approximately 7.5 weeks before the start of pumping to obtain relatively continuous hydraulic head data throughout the testing period, as discussed below (see Attachment A-1).

A.3.2 Water-Level Measurements During Pumping

Extensive, manual water-level measurement rounds were obtained on the seventh day of pumping from RW-13, and again on the seventh day of pumping from both RW-13 and RW-1R (Table A-3). These data sets included overburden and bedrock wells/piezometers in the following areas/clusters:

- Town of Southington Well Field Property;
- East of Queen Street;
- Between Queen Street and Quinnipiac River (MW-501 and P-101/MW-706 series);
- West of Operations Area (P-8/MW-702, MW-209, and PZO/PZR-6 series); and

- The remaining wells/piezometers shown on Geologic Cross Section B-B' (Figures A-5, A-8, and A-11).

These data were used to help delineate the bedrock containment areas achieved by pumping from well RW-13 alone, and well RW-13 combined with well RW-1R.

A.3.3 Transducer/Data Logger Ground-Water Elevation Monitoring

Approximately 7.5 weeks before pumping from well RW-13 and RW-1R, BBL installed pressure transducers and data loggers at the key bedrock wells previously used to calculate the stagnation point location, namely:

- Shallow Bedrock Wells/Piezometers--MW-704R, PZR-2R, and MW-707R; and
- Deep Bedrock Wells/Piezometers--MW-704DR, PZR-2DR, and MW-707DR.

Also, a pressure transducer and data logger was installed at bedrock monitoring well P-2A to continuously record hydraulic head conditions in the bedrock in the SRSNE Operations Area. These data provided a basis to discern the NTCRA 1 pumping system influence and/or any changes upon start-up of well RW-13 or well RW-1R. The hydrographs from these wells are presented in Attachment A-1, as discussed below.

A.4 Pumping from Well RW-13

Pumping started at overburden ground-water extraction well RW-13 at 13:00 on July 14, 1999. The initial pumping rate was over 40 gpm, but leveled off at approximately 25 gpm within 4 hours of pumping (Table A-4). The average rate during the first seven days of pumping was approximately 24 gpm. On the seventh day of pumping from well RW-13 (July 21, 1999), an extensive round of ground-water elevation measurements was obtained before starting pumping from bedrock well RW-1R. Based on the NAPL zone head monitoring data described above, the pumping rate at well RW-13 was reduced to approximately 19 gpm on July 22, 1999, as a cautionary measure for the remainder of the Interim Ground-Water Containment Evaluation. Well RW-13 continued to pump during the seven-day pumping period of well RW-1R. The average pumping rate at well RW-13 during 15 days of pumping was approximately 21 gpm. Well RW-13 was shut down at 18:35 on July 29, 1999, to perform a one-day recovery period.

A.5 Pumping from Wells RW-13 and RW-1R

Pumping started at bedrock well ground-water extraction well RW-1R at 18:32 on July 21, 1999. Pumping at well RW-1R was controlled with float switches to establish and maintain a initial in-well drawdown of 40 feet +/- 1.5 feet. Based on the NAPL zone gradient monitoring data, however, the controls at well RW-1R were raised on July 22, 1999, to maintain an approximate 20-foot drawdown, with an average pumping rate of approximately 0.1 gpm (Table A-5). The average pumping rate at well RW-1R during seven days of operation was approximately 0.1 gpm. On the seventh day of pumping from wells RW-13 and RW-13, an extensive round of ground-water elevation measurements was obtained. Pumping at both wells continued until 15:10 on July 28, 1999, when well RW-1R was shut down to initiate a two-day recovery phase. Well RW-13 was shut off the following day.

A.6 Data Evaluation

This subsection describes in detail the key findings from the Interim Ground-Water Containment Evaluation.

A.6.1 Hydrographs

Attachment A-1 presents three hydrographs with continuous data recorded from May 21, 1999 until July 28, 1999, at the following wells (see well locations on Figure A-2):

- Shallow bedrock well P-2A, in the southeastern corner of the former SRSNE Operations Area;
- Shallow bedrock wells/piezometers MW-704R, MW-707R, and PZR-2R; and
- Deep bedrock wells/piezometers MW-704DR, MW-707DR, and PZR-2DR.

The hydrograph of shallow bedrock well P-2A showed a general decline over the majority of the monitoring period. Between May 26 and July 14, 1999, the water level declined smoothly by approximately 3.3 feet (average decline rate of 0.5 feet per week). In comparison, the water level declined approximately 1.7 feet (average of 0.2 feet per week) at the other six bedrock wells monitored using transducers, indicating a faster pre-pumping (background) head change in the area north-northwest of the extraction wells. Negligible response was observed during the startup of well RW-13 on July 14, 1999 or well RW-1R on July 21, 1999, and no recovery response was noted at well P-2A upon shutdown of these wells on July 29 and 28, 1999, respectively. The portion of the well P-2A hydrograph prior to July 14, 1999 indicated no apparent response to cycling of the 12 NTCRA 1 overburden pumping wells. The only obvious response at well P-2A was a drawdown of approximately 0.3 feet upon reactivation of the NTCRA 1 containment system wells after a brief power brownout on July 19, 1999.

The hydrographs of shallow bedrock wells/piezometers MW-704R, MW-707R, and PZR-2R also showed a general decline over the majority of the pre-pumping monitoring period. All three of the shallow bedrock wells monitored with transducers in the Town Well Field had similar background fluctuations, indicating that the overall hydraulic gradient was consistent throughout the pre-pumping period. Wells/piezometers MW-704R, MW-707R and PZR-2R indicated systematic responses to pumping from wells RW-13 and/or RW-1R (including responses to equipment testing and two short-term power "brownouts"). All three locations indicated a drawdown response immediately after the startup of well RW-13 on July 14, 1999. During pumping from wells RW-13 (with or without RW-1R), well MW-704R indicated a lower head than the other two locations, demonstrating a reversal of the hydraulic gradient in the area downgradient (south) of the extraction wells. The net drawdown at well MW-704R decreased after start-up of well RW-1R on July 21, 1999, presumably because the pumping rate at well RW-13 was also reduced from approximately 26 to 19 gpm on July 22, 1999. However, after start-up of well RW-1R, piezometer PZR-2R indicated additional drawdown. By July 28, 1999, the head at PZR-2R was slightly lower than the head at well MW-707R, which is located further south. These data show that well RW-1R significantly increased the downgradient extent of the gradient reversal in shallow bedrock caused by pumping.

The hydrographs of deep bedrock wells/piezometers MW-704DR, MW-707DR, and PZR-2DR also showed a general decline over the majority of the pre-pumping monitoring period, with the exception of a preliminary equipment test on June 8, 1999. All three of the deep bedrock wells monitored with transducers in the Town Well Field had similar background fluctuations, indicating the overall hydraulic gradient in the deep bedrock was consistent throughout the pre-pumping period. Wells/piezometers MW-704DR, MW-707DR and PZR-2DR indicated systematic responses to pumping from well RW-13 (including responses to equipment testing and two short-term power "brownouts"). All three locations indicated a drawdown response immediately after the startup of well RW-13 on July 14, 1999. During pumping from wells RW-13 (with or without RW-1R), well MW-704DR indicated a lower head than the other two locations, demonstrating a reversal of the deep-bedrock hydraulic gradient in the area downgradient (south) of the extraction wells. The net drawdown at well MW-704DR increased substantially after start-up of well RW-1R on July 21, 1999. These data show that well RW-1R significantly enhanced the gradient reversal in the deep bedrock. The hydraulic divide was in the vicinity of piezometer PZR-2DR throughout the pumping periods at well RW-13, with or without RW-1R.

A.6.2 Drawdown Contour Maps and Cross Section

The drawdown contour maps presented as Figures A-3 and A-4 and the cross section on Figure A-5 show the areal extent and magnitude of the head changes that resulted after start-up of bedrock well RW-1R, with overburden pumping well RW-13 continuing to operate, albeit at a reduced rate. It is important to note that, shortly after the start-up of bedrock well RW-1R, the pumping rate was reduced at well RW-13 based on

NAPL zone monitoring information. Thus, some shallow bedrock monitoring locations near well MW-13 indicated negative apparent drawdown responses, which reflect the combined effects of pumping from well RW-1R and reduction of pumping at well RW-13 (Figure A-3).

The reduction in pumping at RW-13 and background decline in heads complicate the interpretation of drawdown influences associated with well RW-1R, but it appears that the responses were limited to the area immediately surrounding and downgradient of well RW-1R. For example, the head changes of 0.5 feet at shallow bedrock well P-2A and deep bedrock well MW-702DR in the Operations Area during the one week when RW-1R pumped are consistent with the 0.5-foot per week decline observed at well P-2A for several weeks prior to pumping (Attachment A-1). However, well RW-1R did provide additional ground-water containment, as discussed below.

A.6.3 Ground-Water Elevations and Capture Zones on July 21, 1999 (Pumping from Overburden Well RW-13 Alone)

The ground-water elevation data measured during the seventh day of pumping at well RW-13 (July 21, 1999) were contoured as shown in plan view on Figures A-6 and A-7 and in cross section on Figure A-8. These figures illustrate the approximate, three-dimensional capture zone achieved in bedrock after one week of pumping an average of 24 gpm from middle/deep overburden pumping well RW-13. The key deductions from the ground-water elevation contour maps are summarized below.

Shallow Bedrock Ground-Water Elevations and Estimated Capture Zone (Figure A-6) -- Significant potentiometric cone of depression centered about middle/deep overburden pumping well RW-13. Approximately parabolic capture zone extends south to stagnation point located approximately 270 feet south of pumping well RW-13, based on head measured at piezometer PZR-2R. Estimated capture zone includes Operations Area, former Cianci property, and extends beneath the Quinnipiac River to the vicinity of Queen Street.

Deep Bedrock Ground-Water Elevations and Estimated Capture Zone (Figure A-7) -- Significant response, with potentiometric cone of depression centered about middle/deep overburden pumping well RW-13. Approximately parabolic capture zone extends south to stagnation point located approximately 290 feet south of pumping well RW-13, based on heads measured at piezometer PZR-2DR. Estimated capture zone includes Operations Area, former Cianci property, and extends beneath the Quinnipiac River to the vicinity of Queen Street.

These ground-water elevation contour maps indicate that, during relatively steady-state pumping of 24 gpm from middle/deep overburden pumping well RW-13, mappable ground-water capture zones were established in the bedrock. As depicted in cross section on Figure A-8, the capture zone extended approximately 270 to 290 feet south of pumping well RW-13 in all monitored hydrostratigraphic intervals. In addition, the interpreted capture zone achieved by pumping well RW-13 extended approximately to the bottom of the monitored network of wells and piezometers, near deep bedrock piezometer PZR-2DR. The downgradient extent of the capture zones shown on Figures A-6 through A-8 are consistent with stagnation point calculations, included in Attachment A-3.

A.6.4 Ground-Water Elevations and Capture Zones on July 28, 1999 (Pumping from Overburden Well RW-13 and Bedrock Well RW-1R)

The ground-water elevation data measured during the fourteenth day of pumping at well RW-13 and seventh day of pumping at well RW-1R (July 28, 1999) were contoured as shown in plan view on Figures A-9 and A-10 and in cross section on Figure A-11. These figures illustrate the approximate, three-dimensional steady-state capture zone achieved in bedrock by both extraction wells pumping together. The key deductions from the ground-water elevation contour maps are summarized below.

Shallow Bedrock Ground-Water Elevations and Estimated Capture Zone (Figure A-9) -- Significant potentiometric cone of depression centered about the pumping wells. Approximately parabolic capture zone has increased in size, and extends south to stagnation point located approximately 400 feet south of pumping wells, based on heads measured at piezometer PZR-2R and well MW-707R. Estimated capture zone includes Operations Area, former Cianci property, and extends beneath the Quinnipiac River to the vicinity of Queen Street.

Deep Bedrock Ground-Water Elevations and Estimated Capture Zone (Figure A-10) -- Significant response, with deep potentiometric cone of depression centered about pumping wells. Approximately parabolic capture zone extends south to stagnation point located approximately 280 feet south of pumping wells, based on head measured at piezometer PZR-2DR. Estimated capture zone includes Operations Area, former Cianci property, and extends beneath the Quinnipiac River to the vicinity of Queen Street.

These ground-water elevation contour maps indicate that, during relatively steady-state pumping of 19 gpm from overburden well RW-13 and 0.1 gpm from bedrock well RW-1R, mappable ground-water capture zones were established in the bedrock. As depicted in cross-section on Figure A-11, the capture zone extended approximately 280 to 400 feet south of the pumping wells in all monitored hydrostratigraphic intervals. In addition, the interpreted capture zone achieved by pumping well RW-13 extended approximately to the bottom of the monitored network of wells and piezometers, near deep bedrock piezometer PZR-2DR. The downgradient extent of the capture zones shown on Figures A-9 though A-11 are consistent with stagnation point calculations, included in Attachment A-3.

A.7 Treatability Assessment

The analytical data for a sample of the combined discharge from well RW-1R and RW-13, obtained on July 28, 1999, are presented in Attachment A-4. Several volatile organic compounds were detected at low concentrations, orders of magnitude below the NTCRA 1 treatment system basis of design. As presented in the NTCRA 2 100% Ground-Water System Design Report (BBL, November 1999), these results indicate that the existing NTCRA 1 treatment system is capable of treating the discharge from the anticipated NTCRA 2 extraction wells (RW-1R and RW-13). Also, the NTCRA 1 treatment system, which was designed to treat 100 gpm, has the hydraulic capacity to treat the anticipated flow from wells RW-13 and RW-1R.

A.8 Conclusions

The results of the Interim Ground-Water Containment Evaluation confirmed that well RW-13 (with or without well RW-1R) can achieve the requirements of the Containment Test specified in the SOW, and indicated that RW-1R further enhanced the bedrock ground-water Containment Area. Thus, the NTCRA 2 implementation will consist mainly of the continued operation of well RW-13, permanent connection of RW-1R, and pumping from both wells to the existing NTCRA 1 treatment system.

A.9 References

Blasland, Bouck & Lee, Inc. Remedial Investigation Report. Solvents Recovery Service of New England Site, Southington, Connecticut, June 1998.

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

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

Blasland, Bouck & Lee, Inc. NTCRA 2 100% Ground-Water System Design Report. Solvents Recovery Service of New England Site, Southington, Connecticut, November 1999.

Tables

TABLE A-1

SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

BEDROCK HORIZONTAL GRADIENT IN NAPL ZONE

Date	Time	Depth to Water		Ground-Water Elevation*		Head Diff.**	Depth to Water		Ground-Water Elevation*		Head Diff.**
		P-6 (Upgrd.)	P-11A (Dngrd.)	P-6 (Upgrd.)	P-11A (Dngrd.)	1.90' Max.	CPZ-3R (Upgrd.)	CPZ-4R (Dngrd.)	CPZ-3R (Upgrd.)	CPZ-4R (Dngrd.)	2.60' Max.
7/21/99	18:17	6.29	6.97	147.64	146.87	0.77	9.51	9.57	151.32	149.16	2.16
7/22/99	8:00	6.22	6.98	147.71	146.86	0.85	9.92	9.62	150.91	149.11	1.80
7/22/99	10:00	6.24	6.98	147.69	146.86	0.83	9.98	9.63	150.85	149.10	1.75
7/22/99	12:00	6.30	6.98	147.63	146.86	0.77	10.02	9.63	150.81	149.10	1.71
7/22/99	17:42	6.28	6.96	147.65	146.88	0.77	10.13	9.61	150.70	149.12	1.58
7/22/99	9:57	6.35	7.02	147.58	146.82	0.76	10.34	9.72	150.49	149.01	1.48
7/23/99	17:50	6.36	7.02	147.57	146.82	0.75	10.38	9.70	150.45	149.03	1.42
7/23/99	6:45	6.47	7.06	147.46	146.78	0.68	10.46	9.76	150.37	148.97	1.40
7/24/99	19:41	6.35	7.04	147.58	146.80	0.78	10.99	9.77	149.84	148.96	0.88
7/24/99	8:20	6.46	7.04	147.47	146.80	0.67	10.57	9.84	150.26	148.89	1.37
7/25/99	17:45	6.42	6.99	147.51	146.85	0.66	10.57	9.84	150.26	148.89	1.37
7/25/99	6:20	6.46	7.02	147.47	146.82	0.65	10.64	9.89	150.19	148.84	1.35
7/26/99	18:20	6.52	7.02	147.41	146.82	0.59	10.62	9.92	150.21	148.81	1.40
7/26/99	5:00	6.59	7.10	147.34	146.74	0.60	10.71	9.95	150.12	148.78	1.34
7/27/99	15:45	6.53	7.02	147.40	146.82	0.58	10.76	10.03	150.07	148.70	1.37
7/28/99	9:45	6.64	7.12	147.29	146.72	0.57	10.79	10.03	150.04	148.70	1.34
7/28/99	16:20	NM	7.11	NM	146.73	NM	NM	10.07	NM	148.66	NM
7/28/99	17:15	6.52	7.11	147.41	146.73	0.68	10.81	10.06	150.02	148.67	1.35
7/28/99	18:22	NM	7.11	NM	146.73	NM	NM	10.05	NM	148.68	NM
7/29/99	6:40	6.59	7.15	147.34	146.69	0.65	10.80	10.04	150.03	148.69	1.34
7/29/99	17:20	6.59	7.12	147.34	146.72	0.62	10.82	10.09	150.01	148.64	1.37
7/29/99	9:45	6.65	6.91	147.28	146.93	0.35	10.86	10.08	149.97	148.65	1.32
7/30/99	17:45	6.59	6.87	147.34	146.97	0.37	10.89	10.13	149.94	148.60	1.34

Notes: **All measurements are in feet; elevations are referenced to the NGVD of 1929.**

* Ground-water elevations based on the following measuring point elevations:
CPZ-3R: 160.83; CPZ-4R: 158.73; P-6: 153.93; P-11A: 153.84.

Pumping Schedule: Pump On --- Pump Off

RW-13:	7/14/99,13:00 --- 7/29/99,18:35
RW-1R:	7/21/99,18:32 --- 7/28/99,15:10

** Head difference expressed as first location (upgradient) minus second location (downgradient). Maximum head differences determined based on weekly data collected as part of NTCRA 1 compliance monitoring between July 1995 and October 1998.

NM = Not Measured.

TABLE A-2

SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

OVERBURDEN/BEDROCK VERTICAL GRADIENT IN NAPL ZONE

		Depth to Water		Ground-Water Elevation*		Head Diff.**	Depth to Water		Ground-Water Elevation*		Head Diff.**	Depth to Water		Ground-Water Elevation*		Head Diff.**
Date	Time	CPZ-4 (Ovb)	CPZ-4R (Bdrk)	CPZ-4 (Ovb)	CPZ-4R (Bdrk)	0.37 Max.	MW-413 (Ovb)	MW-414 (Bdrk)	MW-413 (Ovb)	MW-414 (Bdrk)	3.42 Max.	P-11B (Ovb)	P-11A (Bdrk)	P-11B (Ovb)	P-11A (Bdrk)	-0.04 Max.
7/21/99	18:17	11.39	9.57	147.41	149.16	-1.75	7.80	10.51	152.86	150.86	2.00	8.50	6.97	146.75	146.87	-0.12
7/21/99	22:00	11.38	9.58	147.42	149.15	-1.73	NM	NM	NM	NM	NM	8.50	7.02	146.75	146.82	-0.07
7/22/99	8:00	11.43	9.62	147.37	149.11	-1.74	7.90	12.21	152.76	149.16	3.60	8.51	6.98	146.74	146.86	-0.12
7/22/99	10:00	11.42	9.63	147.38	149.10	-1.72	7.91	12.2	152.75	149.17	3.58	8.50	6.98	146.75	146.86	-0.11
7/22/99	12:00	11.40	9.63	147.40	149.10	-1.70	7.91	12.23	152.75	149.14	3.61	8.49	6.98	146.76	146.86	-0.10
7/22/99	17:47	11.41	9.61	147.39	149.12	-1.73	7.95	12.28	152.71	149.09	3.62	8.42	6.96	146.83	146.88	-0.05
7/23/99	9:57	11.42	9.72	147.38	149.01	-1.63	7.99	12.37	152.67	149.00	3.67	8.55	7.02	146.70	146.82	-0.12
7/23/99	17:50	11.47	9.70	147.33	149.03	-1.70	8.01	12.36	152.65	149.01	3.64	8.52	7.02	146.73	146.82	-0.09
7/24/99	6:45	11.53	9.76	147.27	148.97	-1.70	8.05	12.42	152.61	148.95	3.66	8.56	7.06	146.69	146.78	-0.09
7/24/99	19:41	11.54	9.77	147.26	148.96	-1.70	8.08	12.42	152.58	148.95	3.63	8.56	7.04	146.69	146.80	-0.11
7/25/99	8:20	11.58	9.84	147.22	148.89	-1.67	8.12	12.51	152.54	148.86	3.68	8.50	7.04	146.75	146.80	-0.05
7/25/99	17:45	11.58	9.84	147.22	148.89	-1.67	8.14	12.49	152.52	148.88	3.64	8.59	6.99	146.66	146.85	-0.19
7/26/99	6:20	11.64	9.88	147.16	148.85	-1.69	8.12	12.56	152.54	148.81	3.73	8.60	7.07	146.65	146.77	-0.12
7/26/99	18:20	11.68	9.92	147.12	148.81	-1.69	8.20	12.57	152.46	148.80	3.66	8.62	7.08	146.63	146.76	-0.13
7/27/99	5:00	11.72	9.95	147.08	148.78	-1.70	8.22	12.62	152.44	148.75	3.69	8.59	7.10	146.66	146.74	-0.08
7/27/99	15:45	11.72	10.03	147.08	148.70	-1.62	8.24	12.60	152.42	148.77	3.65	8.64	7.08	146.61	146.76	-0.15
7/28/99	9:45	11.72	10.03	147.08	148.70	-1.62	8.28	12.65	152.38	148.72	3.66	8.60	7.12	146.65	146.72	-0.07
7/28/99	16:20	11.80	10.07	147.00	148.66	-1.66	8.30	12.62	152.36	148.75	3.61	8.61	7.11	146.64	146.73	-0.09
7/28/99	17:15	11.77	10.06	147.03	148.67	-1.64	8.29	12.62	152.37	148.75	3.62	8.60	7.11	146.65	146.73	-0.08
7/28/99	18:21	11.77	10.05	147.03	148.68	-1.65	8.30	12.63	152.36	148.74	3.62	8.61	7.12	146.64	146.72	-0.08
7/29/99	6:40	11.80	10.04	147.00	148.69	-1.69	8.32	12.62	152.34	148.75	3.59	8.66	7.15	146.59	146.69	-0.10
7/29/99	17:20	11.84	10.09	146.96	148.64	-1.68	8.34	12.66	152.32	148.71	3.61	8.64	7.12	146.61	146.72	-0.11
7/30/99	9:45	11.86	10.08	146.94	148.65	-1.71	8.37	12.73	152.29	148.64	3.65	8.45	6.91	146.80	146.93	-0.13
7/30/99	17:45	11.85	10.13	146.95	148.60	-1.65	8.37	12.69	152.29	148.68	3.61	8.40	6.87	146.85	146.97	-0.12

Notes: **All measurements are in feet; elevations are referenced to the NGVD of 1929.**

* Ground-water elevations based on the following measuring point elevations:
CPZ-4: 158.80; CPZ-4R: 158.73; MW-413: 160.66; MW-414: 161.37; P-11A: 153.84; P-11B: 155.25.

** Head difference expressed as first location (overburden) minus second location (bedrock).
Positive head difference indicates downward gradient; negative head difference indicates upward gradient.
Maximum head differences determined based on weekly data collected as part of NTCRA 1 compliance monitoring between July 1995 and October 1998.

NM = Not Measured.

Pumping Schedule: Pump On --- Pump Off

RW-13:	7/14/99,13:00 --- 7/29/99,18:35
RW-1R:	7/21/99,18:32 --- 7/28/99,15:10

TABLE A-3

SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

PRE-PUMPING AND COMPREHENSIVE GROUND-WATER ELEVATION MEASUREMENT ROUNDS

Location	X (Easting)	Y (Northing)	Ground Surface Elev.	Meas. Point Elev.	Depth to Water 07/14	Water Elev. 07/14	Depth to Water 07/21	Water Elev. 07/21	Depth to Water 07/28	Water Elev. 07/28	Apparent Drawdown 7/14-7/28/9	Well Formation	Notes
CPZ-2	565216	286045	156.44	158.64	NM	NA	8.76	149.88	9.18	149.46	0.4	O	
CPZ-4	565322	286092	155.21	158.80	NM	NA	11.39	147.41	11.78	147.02	0.4	O	
CPZ-2R	565217	286039	156.74	160.79	NM	NA	6.03	154.76	6.56	154.23	0.5	R	
CPZ-3R	565286	286158	156.67	160.83	NM	NA	9.51	151.32	10.76	150.07	1.3	R	
CPZ-4R	565322	286085	154.91	158.73	NM	NA	9.57	149.16	10.04	148.69	0.5	R	
CPZ-2A	565219	286090	156.34	158.86	NM	NA	8.21	150.65	8.59	150.27	0.4	O	
CW-1-78	565213	285075	157.80	158.46	NM	NA	NF	NF	13.42	145.04	NA	O	
CW-2-75	565407	285677	152.60	153.69	NM	NA	8.21	145.48	8.22	145.47	0.0	O	
CW-2-78	565073	285036	161.00	163.81	NM	NA	>16.1 (dry)	<147.71	18.76	145.05	NA	O	Partial obstruction a 16 feet.
CW-3-75	565678	285115	152.00	153.04	NM	NA	7.92	145.12	8.00	145.04	0.1	O	
CW-3-78	565162	284652	145.90	150.56	NM	NA	NF	150.56	NF	150.56	0.0	O	
CW-4-75	565312	285355	150.60	151.42	NM	NA	5.78	145.64	5.93	145.49	0.2	O	
CW-4-78	565155	284650	145.70	147.28	NM	NA	NF	NF	NF	NF	NA	R	
CW-5-75	565286	285030	152.80	153.12	NM	NA	NF	153.12	8.47	144.65	NA	O	
CW-5-78	565251	284543	152.60	153.11	NM	NA	NF	153.11	NF	153.11	NA	O	
CW-6-75	565222	284832	150.10	151.31	NM	NA	11.22	140.09	11.27	140.04	0.1	O	
CW-6-78	565396	284625	146.00	147.43	NM	NA	6.06	141.37	6.09	141.34	0.0	O	
CW-7-75	565316	284843	150.80	151.10	NM	NA	6.71	144.39	6.73	144.37	0.0	O	
CW-7A	565314	284843	150.80	151.13	NM	NA	7.07	144.06	7.10	144.03	0.0	O	
CW-B-77	565310	285711	150.52	151.72	NM	NA	6.22	145.50	6.42	145.30	0.2	O	
DP-4	565524	286655	149.06	150.87	NM	NA	2.98	147.89	3.04	147.83	0.1	O	
MW-01	565281	285950	155.00	157.73	NM	NA	10.07	147.66	10.45	147.28	0.4	OR	
MW-02	565307	285338	150.30	153.18	NM	NA	7.92	145.26	8.05	145.13	0.1	OR	
MW-03	565509	285065	149.80	153.11	8.68	144.43	8.91	144.20	9.00	144.11	0.1	O	
MW-04	565622	285470	148.80	151.62	NM	NA	6.36	145.26	6.23	145.39	-0.1	OR	
MW-05	565651	286030	147.40	150.67	NM	NA	NM	NM	4.26	146.41	NA	R	
MW-06	565660	286017	148.20	150.84	NM	NA	4.23	146.61	4.25	146.59	0.0	O	
MW-07	565646	286028	147.30	150.36	NM	NA	4.37	145.99	4.38	145.98	0.0	O	
MW-08	565654	286015	147.20	150.19	NM	NA	4.17	146.02	4.17	146.02	0.0	O	
MW-121A	565539	285834	150.51	153.06	NM	NA	6.82	146.24	7.47	145.59	0.7	R	
MW-121B	565532	285817	150.96	153.05	NM	NA	7.70	145.35	7.66	145.39	-0.0	O	

TABLE A-3

SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

PRE-PUMPING AND COMPREHENSIVE GROUND-WATER ELEVATION MEASUREMENT ROUNDS

Location	X (Easting)	Y (Northing)	Ground Surface Elev.	Meas. Point Elev.	Depth to Water 07/14	Water Elev. 07/14	Depth to Water 07/21	Water Elev. 07/21	Depth to Water 07/28	Water Elev. 07/28	Apparent Drawdown 7/14-7/28/9	Well Formation	Notes
MW-124C	565238	285852	155.98	158.51	NM	NA	8.38	150.13	8.82	149.69	0.4	R	
MW-127B	565403	285087	147.86	149.84	NM	NA	4.68	145.16	4.77	145.07	0.1	O	
MW-127C	565404	285081	147.58	150.05	NM	NA	4.84	145.21	4.98	145.07	0.1	R	
MW-128	565211	285319	155.43	157.24	NM	NA	11.38	145.86	11.50	145.74	0.1	R	
MW-203A	566355	285360	188.78	188.39	NM	NA	39.00	149.39	39.18	149.21	0.2	R	
MW-203B	566351	285359	188.47	188.23	NM	NA	38.68	149.55	38.89	149.34	0.2	O	
MW-204A	565669	285566	148.83	150.87	NM	NA	5.76	145.11	5.66	145.21	-0.1	R	
MW-204B	565652	285569	148.74	150.63	NM	NA	5.66	144.97	5.49	145.14	-0.2	O	
MW-205A	565559	284997	150.29	152.70	NM	NA	7.42	145.28	7.51	145.19	0.1	R	
MW-205B	565551	284992	149.96	152.18	NM	NA	6.97	145.21	7.05	145.13	0.1	O	
MW-206A	565732	284158	153.13	152.71	NM	NA	7.06	145.65	7.15	145.56	0.1	R	
MW-206B	565726	284159	153.20	152.90	NM	NA	7.30	145.60	7.36	145.54	0.1	O	
MW-208A	565678	283622	156.82	156.55	NM	NA	10.18	146.37	10.31	146.24	0.1	R	
MW-209A	564582	286263	196.13	198.25	NM	NA	23.04	175.21	23.26	174.99	0.2	R	
MW-209B	564582	286258	195.81	198.31	NM	NA	16.65	181.66	>16.90 (dry)	<181.41	>0.3	O	
MW-413	565278	286350	158.00	160.66	NM	NA	7.80	152.86	8.29	152.37	0.5	O	
MW-414	565273	286339	158.29	161.37	NM	NA	10.51	150.86	12.67	148.70	2.2(?)	R	
MW-501A	565838	286346	169.26	169.15	NM	NA	22.04	147.11	22.10	147.05	0.1	R	
MW-501B	565837	286343	169.35	169.17	NM	NA	21.85	147.32	22.09	147.08	0.2	O	
MW-501C	565838	286350	169.17	168.94	NM	NA	21.80	147.14	22.86	146.08	1.1	O	
MW-701D	564579	286254	196.15	198.71	NM	NA	19.01	179.70	19.22	179.49	0.2	R	
MW-702D	564912	286075	179.13	181.30	NM	NA	22.48	158.82	22.94	158.36	0.5	R	
MW-703D	565300	285097	153.02	155.42	NM	NA	10.41	145.01	10.52	144.90	0.1	O	
MW-703D	565299	285073	153.04	155.20	NM	NA	10.12	145.08	10.23	144.97	0.1	R	
MW-703S	565299	285087	153.40	155.68	NM	NA	10.80	144.88	10.89	144.79	0.1	O	
MW-704D	565540	285591	150.49	153.47	7.26	146.21	8.88	144.59	8.62	144.85	-0.3	O	
MW-704D	565552	285565	150.55	152.90	6.34	146.56	9.68	143.22	21.06	131.84	11.4	R	
MW-704	565557	285574	150.58	152.66	6.43	146.23	8.14	144.52	7.95	144.71	-0.2	O	
MW-704R	565568	285583	150.52	151.66	5.39	146.27	8.85	142.81	8.48	143.18	-0.4	R	
MW-704S	565557	285583	150.53	152.78	NM	NA	7.32	145.46	7.48	145.30	0.2	O	
MW-705D	565421	286754	159.39	161.58	NM	NA	6.11	155.47	6.50	155.08	0.4	O	

TABLE A-3

SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

PRE-PUMPING AND COMPREHENSIVE GROUND-WATER ELEVATION MEASUREMENT ROUNDS

Location	X (Easting)	Y (Northing)	Ground Surface Elev.	Meas. Point Elev.	Depth to Water 07/14	Water Elev. 07/14	Depth to Water 07/21	Water Elev. 07/21	Depth to Water 07/28	Water Elev. 07/28	Apparent Drawdown 7/14-7/28/9	Well Formation	Notes
MW-705D	565429	286750	158.79	160.89	NM	NA	6.40	154.49	6.78	154.11	0.4	R	
MW-705R	565422	286744	159.54	161.50	NM	NA	7.64	153.86	8.02	153.48	0.4	R	
MW-706D	565668	286216	147.82	149.91	NM	NA	2.74	147.17	3.08	146.83	0.3	R	
MW-707D	565599	285102	153.78	156.00	10.60	145.40	10.83	145.17	10.93	145.07	0.1	O	
MW-707D	565567	285124	153.83	156.72	10.89	145.83	11.53	145.19	11.78	144.94	0.3	R	
MW-707	565605	285109	153.41	155.12	NM	NA	9.95	145.17	10.02	145.10	0.1	O	
MW-707R	565599	285115	153.91	155.85	10.07	145.78	10.85	145.00	10.88	144.97	0.0	R	
MW-707S	565608	285116	153.16	154.94	NM	NA	9.98	144.96	10.05	144.89	0.1	O	
MW-708S	566241	286418	222.10	224.57	NM	NA	76.20	148.37	76.30	148.27	0.1	O	
MW-708	566245	286405	223.30	226.08	NM	NA	77.41	148.67	77.51	148.57	0.1	O	
MW-708R	566254	286408	223.20	225.60	NM	NA	76.38	149.22	76.54	149.06	0.2	R	
MW-708D	566251	286424	221.90	224.85	NM	NA	76.81	148.04	76.93	147.92	0.1	R	
MW-709R	565403	287092	161.60	161.53	NM	NA	7.05	154.48	7.36	154.17	0.3	R	
MW-709D	565403	287092	161.60	161.53	NM	NA	5.61	155.92	5.90	155.63	0.3	R	
MW-710S	566112	284847	165.00	164.93	NM	NA	17.92	147.01	18.02	146.91	0.1	O	
MW-710R	566110	284836	165.00	164.58	NM	NA	18.19	146.39	18.27	146.31	0.1	R	
MW-710D	566113	284857	165.00	164.99	NM	NA	18.40	146.59	18.49	146.50	0.1	R	
MW-801S	565124	285425	152.67	154.36	NM	NA	8.69	145.67	8.90	145.46	0.2	O	
MW-801R	565126	285430	152.52	154.59	NM	NA	8.20	146.39	8.45	146.14	0.3	R	
MWL-313	565352	285992	154.52	156.61	NM	NA	10.71	145.90	11.03	145.58	0.3	O	
MWL-314	565502	286001	153.68	155.53	NM	NA	9.72	145.81	9.94	145.59	0.2	O	
P-101A	565674	286226	148.05	150.49	NM	NA	3.60	146.89	3.65	146.84	0.1	R	
P-101B	565675	286232	148.19	150.62	NM	NA	3.72	146.90	3.77	146.85	0.1	O	
P-101C	565676	286238	148.34	150.73	NM	NA	5.05	145.68	5.08	145.65	0.0	O	
P-102A	565702	286458	148.77	151.01	NM	NA	NF	NF	3.91	147.10	NA	R	
P-102B	565702	286465	148.74	151.06	NM	NA	NF	NF	3.91	147.15	NA	O	
P-102C	565702	286472	148.71	151.20	NM	NA	NF	NF	5.22	145.98	NA	O	
P-11A	565583	286220	151.80	153.84	NM	NA	6.97	146.87	7.12	146.72	0.2	R	
P-11B	565583	286220	152.22	155.25	NM	NA	8.50	146.75	8.64	146.61	0.1	O	
P-13	565242	285851	155.88	158.43	NM	NA	12.11	146.32	12.37	146.06	0.3	O	
P-15	564917	285631	179.18	181.65	NM	NA	>20.9	<160.75	>26.0	NA	NA	R	P-15 Obstructed at 20.9 feet;

TABLE A-3

SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

PRE-PUMPING AND COMPREHENSIVE GROUND-WATER ELEVATION MEASUREMENT ROUNDS

Location	X (Easting)	Y (Northing)	Ground Surface Elev.	Meas. Point Elev.	Depth to Water 07/14	Water Elev. 07/14	Depth to Water 07/21	Water Elev. 07/21	Depth to Water 07/28	Water Elev. 07/28	Apparent Drawdown 7/14-7/28/9	Well Formation	Notes
P-2A	565118	286221	166.41	165.94	9.05	156.89	9.77	156.17	10.28	155.66	0.5	R	obstruction driven to 26.0 feet.
P-7	565439	286805	158.06	160.31	NM	NA	5.05	155.26	5.42	154.89	0.4	O	Well still appeared "dry".
P-8	564918	286064	179.72	181.25	NM	NA	21.40	159.85	21.40	159.85	0.0	O	
P-8A	564921	286067	179.66	181.62	NM	NA	22.90	158.72	23.32	158.30	0.4	R	
PZO-6	564176	285978	222.00	221.68	NM	NA	>9.0 (dry)	<212.68	>9.0 (dry)	<212.68	NA	O	
PZO-2M	565586	285328	152.70	154.81	9.06	145.75	9.51	145.30	9.59	145.22	0.1	O	
PZO-2D	565578	285340	152.48	154.29	8.47	145.82	8.97	145.32	9.03	145.26	0.1	O	
PZO-3M	565736	285211	150.59	152.58	NM	NA	7.16	145.42	7.21	145.37	0.1	O	
PZO-3D	565726	285210	150.85	153.13	NM	NA	7.30	145.83	7.35	145.78	0.0	O	
PZO-6S	565487	285569	151.28	153.07	NM	NA	7.52	145.55	7.70	145.37	0.2	O	
PZO-121	565547	285820	150.14	152.14	NM	NA	6.75	145.39	6.95	145.19	0.2	O	
PZO-204	565649	285565	149.06	151.16	NM	NA	6.04	145.12	6.21	144.95	0.2	O	
PZO-204	565658	285562	149.18	151.16	NM	NA	6.00	145.16	5.96	145.20	-0.0	O	
PZR-6	564177	285975	221.90	221.55	NM	NA	16.31	205.24	16.63	204.92	0.3	R	
PZR-1R	565722	285404	148.72	151.07	NM	NA	3.70	147.37	3.92	147.15	0.2	R	
PZR-2R	565562	285330	152.10	153.77	7.74	146.03	8.49	145.28	8.82	144.95	0.3	R	
PZR-2DR	565579	285319	153.41	154.92	8.86	146.06	9.65	145.27	9.67	145.25	0.0	R	
PZR-3R	565745	285220	149.92	152.39	NM	NA	7.00	145.39	7.00	145.39	0.0	R	
PZR-4R	565369	285471	152.36	153.95	NM	NA	8.38	145.57	8.53	145.42	0.2	R	
PZR-4DR	565388	285464	151.15	153.25	NM	NA	4.70	148.55	5.07	148.18	0.4	R	
PZR-5R	565280	285532	152.12	154.84	NM	NA	8.19	146.65	8.44	146.40	0.3	R	
RW-13	565560	285602	150.12	149.51	3.25	146.26	23.18	126.33	31.88	117.63	8.7	O	
RW-1R	565571	285561	149.80	152.18	5.84	146.34	10.38	141.80	30.28	121.90	19.9	R	
SRS-1	565194	285871	159.89	160.86	NM	NA	10.56	150.30	11.03	149.83	0.5	O	
SRS-2	565200	285871	159.64	160.68	NM	NA	>11.2 (dry)	<149.48	>11.2 (dry)	<149.48	NA	O	
SRS-3	565394	285864	151.38	152.68	NM	NA	>5.0	<147.7	6.42	146.26	NA	O	SRS-3, SRS-4 obstructed at
SRS-4	565392	285868	151.51	152.65	NM	NA	>5.0	<147.7	7.70	144.95	NA	O	5 feet; removed on 7/28/99.
SRS-5	565530	285997	152.57	154.35	NM	NA	8.71	145.64	8.79	145.56	0.1	O	
SRS-6	565578	286010	152.81	153.88	NM	NA	>5.0	<148.9	8.00	145.88	NA	O	
TW-11	565282	285956	155.60	157.39	NM	NA	10.26	147.13	10.26	147.13	0.0	O	
TW-12	565269	287366	175.00	177.15	NM	NA	22.54	154.61	22.95	154.20	0.4	O	

TABLE A-3

SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

PRE-PUMPING AND COMPREHENSIVE GROUND-WATER ELEVATION MEASUREMENT ROUNDS

Location	X (Easting)	Y (Northing)	Ground Surface Elev.	Meas. Point Elev.	Depth to Water 07/14	Water Elev. 07/14	Depth to Water 07/21	Water Elev. 07/21	Depth to Water 07/28	Water Elev. 07/28	Apparent Drawdown 7/14-7/28/9	Well Formation	Notes

Notes: All measurements are in feet; elevations are referenced to the NGVD of 1929.

< = Water elevation below calculated result.

NM = Not Measured, inaccessible.

NF = Not Found.

NA = Not Applicable or Available.

O = Overburden.

R = Bedrock.

Pumping Schedule: Pump On --- Pump Off

RW-13: 7/14/99,13:00 --- 7/29/99,18:35

RW-1R: 7/21/99,18:32 --- 7/28/99,15:10

TABLE A-4

SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

PUMPING RATE MONITORING DATA -- RW-13

	Time	Totallizer (gal)		Time	Interval	Cumulative	Cumulative
Date	(Hr:Min)	Current	Change	Change (min)	Rate (gpm)	Time (min)	Rate (gpm)
7/14/99	13:00	1907	0	0	0.0	0	0
7/14/99	13:21	2765	858	21	41	21	41
7/14/99	13:25	2948	183	4	46	25	42
7/14/99	13:32	3230	282	7	40	32	41
7/14/99	13:45	3780	550	13	42	45	42
7/14/99	13:56	4240	460	11	42	56	42
7/14/99	14:00	4409	169	4	42	60	42
7/14/99	14:12	4912	503	12	42	72	42
7/14/99	14:55	6718	1806	43	42	115	42
7/14/99	15:21	7809	1091	26	42	141	42
7/14/99	15:49	8981	1172	28	42	169	42
7/14/99	16:21	10268	1287	33	40	202	41
7/14/99	16:39	10681	413	18	23	220	40
7/14/99	16:43	10752	71	4	18	224	40
7/14/99	16:58	11078	326	14	22	238	39
7/14/99	17:00	11129	51	2	25	240	38
7/14/99	17:03	11204	75	3	25	243	38
7/14/99	17:37	12073	869	35	25	278	37
7/14/99	17:39	12123	50	2	25	280	37
7/14/99	18:59	14122	1999	80	25	359	34
7/15/99	7:23	32767	18645	744	25	1103	28
7/15/99	7:24	32792	25	1	25	1104	28
7/15/99	8:21	34216	1424	57	25	1161	28
7/15/99	9:12	35489	1273	51	25	1212	28
7/21/99	15:05	244950	209461	8993	23	10205	24
7/21/99	17:45	248680	3730	160	23	10365	24
7/21/99	18:25	249636	956	40	24	10405	24
7/21/99	20:37	253230	3594	132	27	10537	24
7/21/99	22:30	256160	2930	113	26	10650	24
7/22/99	7:53	266940	10780	563	19	11213	24
7/22/99	10:45	270240	3300	172	19	11385	24
7/22/99	13:22	273340	3100	157	20	11542	24
7/22/99	17:59	278990	5650	272	21	11819	23
7/23/99	10:11	298430	19440	432	45	12791	23
7/23/99	17:55	307420	8990	464	19	13255	23
7/24/99	6:25	322200	14780	690	21	14005	23
7/24/99	18:55	337910	15710	810	19	14755	23
7/25/99	8:30	352185	14275	685	21	15570	22
7/25/99	17:54	362556	10371	564	18	16134	22
7/26/99	6:40	376440	13884	624	22	16900	22
7/26/99	18:32	389020	12580	712	18	17612	22
7/27/99	5:19	400230	11210	793	14	18259	22
7/27/99	16:00	411420	11190	641	17	18900	22
7/28/99	6:30	422220	10800	542	20	19770	21
7/28/99	17:32	438540	16320	784	21	20432	21
7/29/99	6:36	452960	14420	738	20	21216	21
7/29/99	18:18	465410	12450	702	18	21918	21
7/29/99	18:35	465750	340	17	20	21935	21

Notes: RW-13 pump on 7/14/99,13:00; pump off 7/29/99,18:35.

TABLE A-5

SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

PUMPING RATE MONITORING DATA -- RW-1R

Date	Time (Hr:Min)	Totallizer (gal)		Time Change (min)	Interval Rate (gpm)	Cumulative Time (min)	Cumulative Rate (gpm)
		Current	Change				
7/21/99	18:32	16	0	0	0.0	0	0.0
7/21/99	18:39	130	114	7	16.3	7	16.3
7/21/99	18:48	240	110	9	12.2	16	14.0
7/21/99	18:55	325	85	7	12.1	23	13.4
7/21/99	19:01	395	70	6	11.7	29	13.1
7/21/99	19:05	434	39	5	8.7	34	12.5
7/21/99	20:08	434	0	63	0.0	96	4.3
7/21/99	20:11	457	23	3	8.6	99	4.4
7/22/99	8:34	500	43	743	0.1	842	0.6
7/22/99	10:36	500	0	122	0.0	964	0.5
7/22/99	12:44	500	0	128	0.0	1092	0.4
7/22/99	17:45	509	9	301	0.0	1393	0.4
7/23/99	9:51	598	89	494	0.2	1887	0.3
7/23/99	17:40	632	34	469	0.1	2356	0.3
7/24/99	6:07	709	76	693	0.1	3049	0.2
7/24/99	18:35	765	56	808	0.1	3857	0.2
7/25/99	8:15	831	66	680	0.1	4537	0.2
7/25/99	12:30	875	44	555	0.1	5092	0.2
7/26/99	6:15	939	64	625	0.1	5717	0.2
7/26/99	18:05	986	47	710	0.1	6427	0.2
7/27/99	4:55	1051	66	780	0.1	7207	0.1
7/27/99	15:40	1095	44	647	0.1	7854	0.1
7/28/99	9:38	1183	88	1000	0.1	8854	0.1
7/28/99	15:10	Pump Off					

Notes: RW-1R pump on 7/21/99,18:32; pump off 7/28/99,15:10.

FIGURES

Original includes color coding.

NOTE:

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

LEGEND:

- MIDDLE/DEEP OVERBURDEN PUMPING WELL (MW-708M / MW-708S)
- SHALLOW OVERBURDEN MONITORING WELL/PIEZOMETER
- MIDDLE OVERBURDEN MONITORING WELL/PIEZOMETER
- DEEP OVERBURDEN MONITORING WELL/PIEZOMETER
- OVERBURDEN/BEDROCK INTERFACE MONITORING WELL
- NTCRA 1 EXTRACTION WELL
- NTCRA 1 COMPLIANCE PIEZOMETER
- NTCRA 1 WETLAND DRIVEPOINT

0 300' 600'

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
NTCRA 2

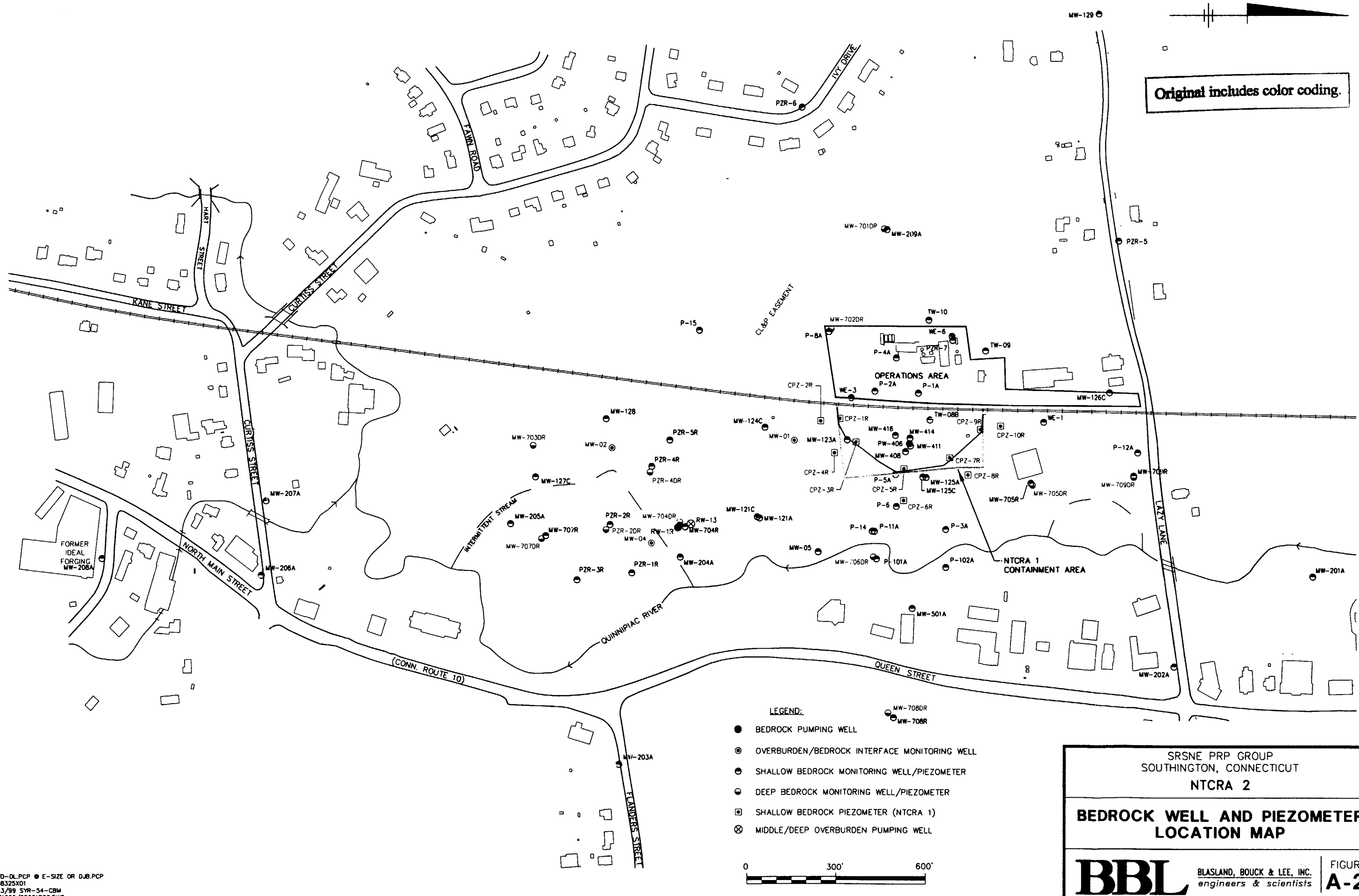
OVERBURDEN WELL, PIEZOMETER, AND DRIVEPOINT LOCATION MAP

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE A-1

P:STD-DL.PCP @ E-SIZE OR DJB.PCP
XREF: 08325X01
10/13/99 SYR-54-CBM
08331013/08331802.DWG

Original includes color coding.



SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
NTCRA 2

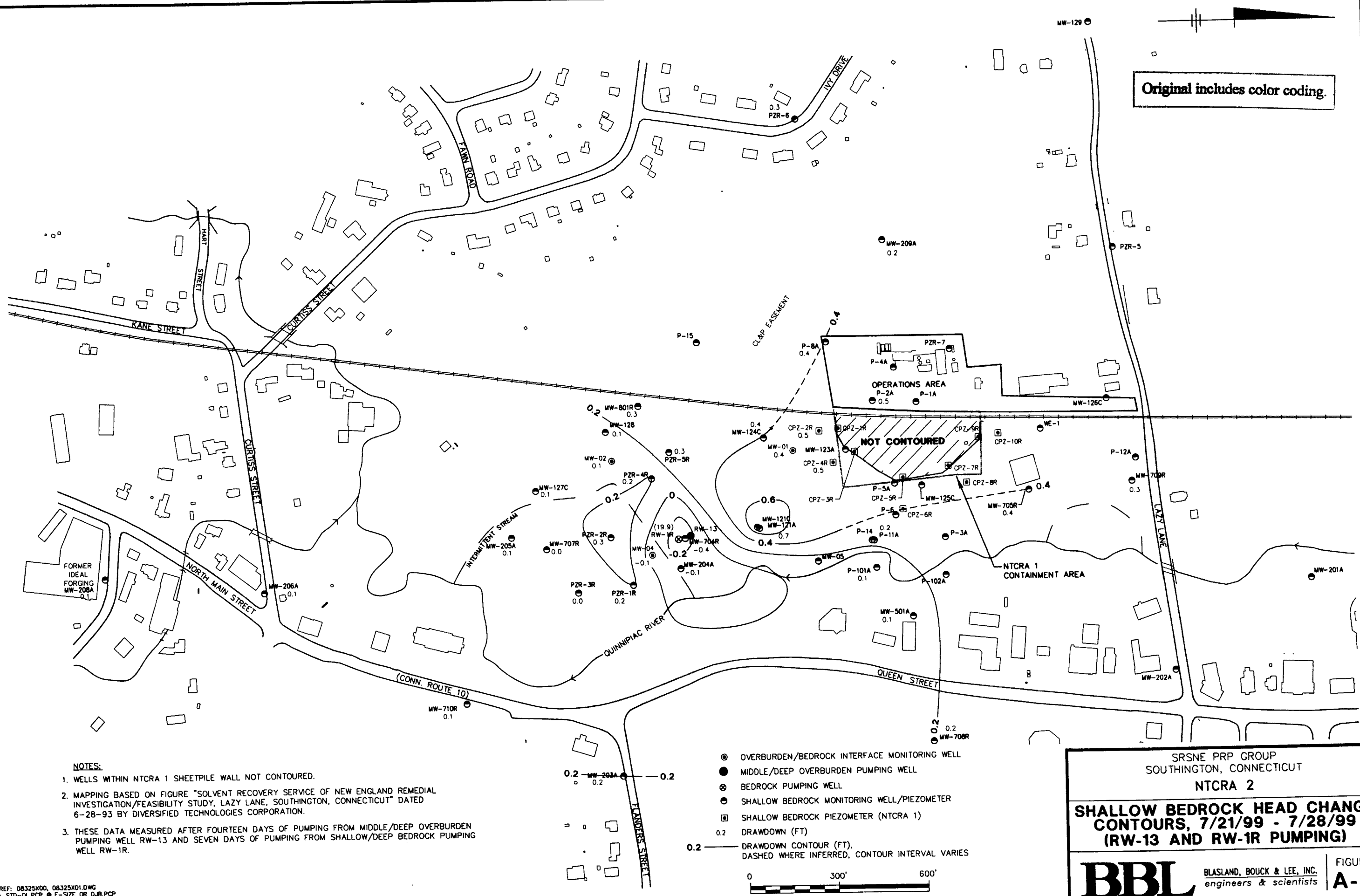
BEDROCK WELL AND PIEZOMETER LOCATION MAP

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE A-2

P:STD-DL.PCP ● E-SIZE OR DJB.PCP
X: 08325X01
10/13/99 SYR-S4-CBM
08331006/08331803.DWG

Original includes color coding.



NOTES:

1. WELLS WITHIN NTCRA 1 SHEETPILE WALL NOT CONTOURED.
2. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.
3. THESE DATA MEASURED AFTER FOURTEEN DAYS OF PUMPING FROM MIDDLE/DEEP OVERBURDEN PUMPING WELL RW-13 AND SEVEN DAYS OF PUMPING FROM SHALLOW/DEEP BEDROCK PUMPING WELL RW-1R.

- OVERBURDEN/BEDROCK INTERFACE MONITORING WELL
- MIDDLE/DEEP OVERBURDEN PUMPING WELL
- BEDROCK PUMPING WELL
- SHALLOW BEDROCK MONITORING WELL/PIEZOMETER
- SHALLOW BEDROCK PIEZOMETER (NTCRA 1)
- 0.2 DRAWDOWN (FT)
- 0.2 —— DRAWDOWN CONTOUR (FT). DASHED WHERE INFERRED, CONTOUR INTERVAL VARIES

0 300' 600'

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
NTCRA 2

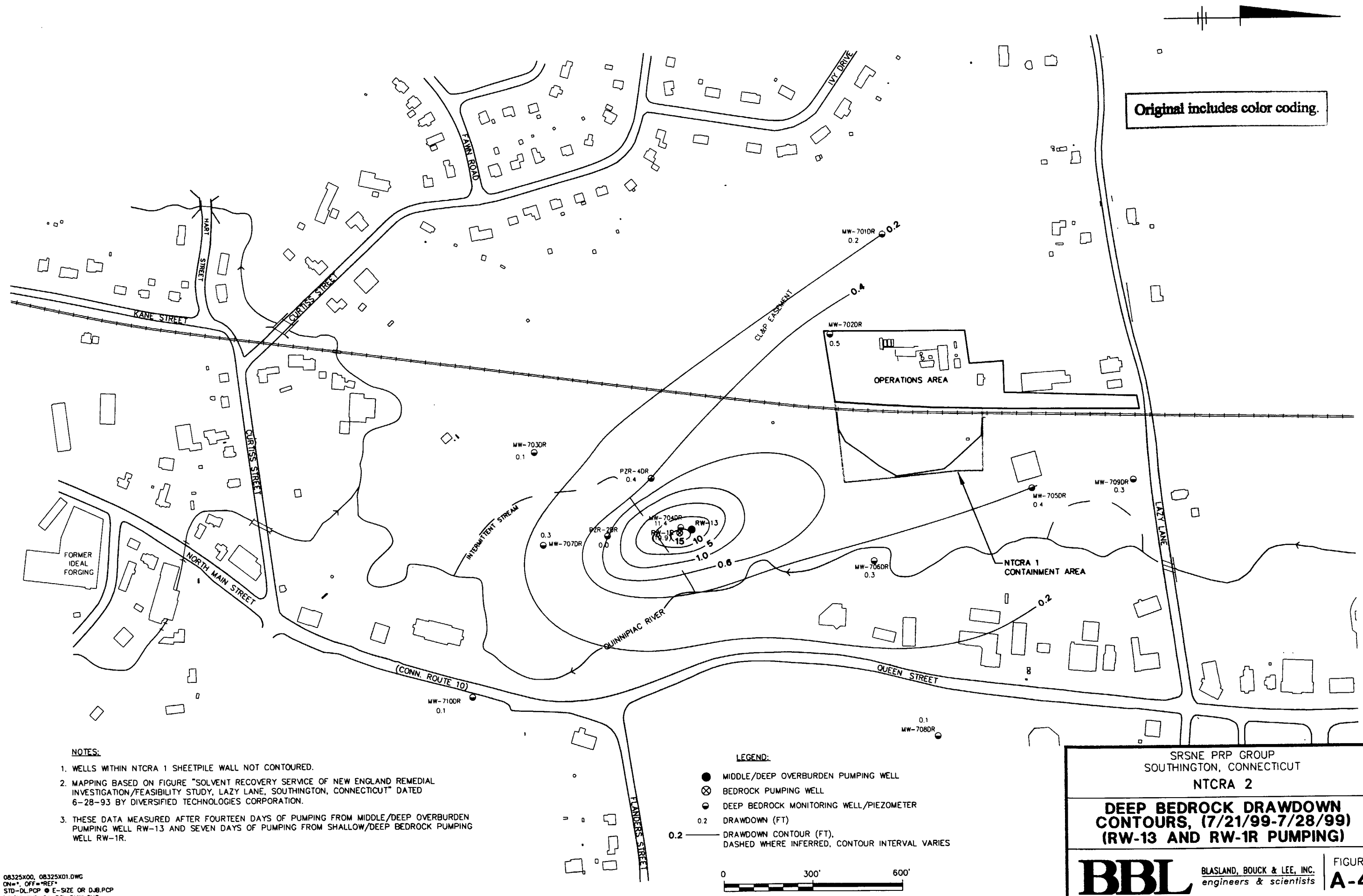
SHALLOW BEDROCK HEAD CHANGE CONTOURS, 7/21/99 - 7/28/99 (RW-13 AND RW-1R PUMPING)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE A-3

XREF: 08325X00, 08325X01.DWG
P: STD-DL.PCP @ E-SIZE OR DJB.PCP
L: ON=*, OFF=REF
10/15/99 SYR-54-PGL DMW GMS

Original includes color coding.



NOTES:

1. WELLS WITHIN NTCRA 1 SHEETPILE WALL NOT CONTOURED.
2. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.
3. THESE DATA MEASURED AFTER FOURTEEN DAYS OF PUMPING FROM MIDDLE/DEEP OVERBURDEN PUMPING WELL RW-13 AND SEVEN DAYS OF PUMPING FROM SHALLOW/DEEP BEDROCK PUMPING WELL RW-1R.

LEGEND:

- ● MIDDLE/DEEP OVERBURDEN PUMPING WELL
- ⊗ BEDROCK PUMPING WELL
- ◒ DEEP BEDROCK MONITORING WELL/PIEZOMETER
- 0.2 DRAWDOWN (FT)
- 0.2 —— DRAWDOWN CONTOUR (FT), DASHED WHERE INFERRED, CONTOUR INTERVAL VARIES

0 300' 600'

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

NTCRA 2

DEEP BEDROCK DRAWDOWN CONTOURS, (7/21/99-7/28/99) (RW-13 AND RW-1R PUMPING)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE A-4

X: 08325X00, 08325X01.DWG
L: ON=*, OFF=*REF*
P: STD-DL.PCP @ E-SIZE OR DJB.PCP
10/15/99 SYR-54-PGL DMW GWS
08331012/GW/08331W02.DWG

SOUTH B — NORTH B'

FORMER IDEAL FORGING PROPERTY | TOWN WELL FIELD PROPERTY | FORMER CIANCI PROPERTY

MW-208A, DARLING STREET, TRIBUTARY STREAM, NORTH MAIN STREET, MW-206B, MW-206A, CURTISS STREET, QUINNIPIAC RIVER, QUINNIPIAC RIVER, MW-205B, MW-205A, MW-707S, MW-707M, MW-707D, MW-707R, MW-707DR, PZO-2M, PZO-2D, PZR-2R, PZR-2DR, MW-704S, RW-1R, MW-704D, MW-704R, MW-704DR, RW-13, MW-121B, MW-121C, MW-121A, MW-07, MW-06, MW-05, QUINNIPIAC RIVER, P-101C, P-101B, P-101A, MW-706DR, QUINNIPIAC RIVER, QUINNIPIAC RIVER, P-102C, P-102B, P-102A, QUINNIPIAC RIVER, DP-4, MW-705D, MW-705R, MW-705DR, P-7, MW-709R, MW-709DR, LAZY LANE, TW-12

OUTWASH | GRAVELLY DRIFT | SILTY TILL | BEDROCK | BEDROCK

ELEVATION IN FEET

LEGEND

- MW-125A — WELL NUMBER
- MONITORING WELL
- ESTIMATED WATER TABLE
- 1.0 — DRAWDOWN CONTOUR (FT) JULY 28, 1999 INTERVAL VARIABLE
- 0.4 — DRAWDOWN (FT) MEASURED JULY 28, 1999
- SCREENED INTERVAL
- OPEN BEDROCK BOREHOLE INTERVAL (RW-1R)
- BOTTOM OF BORING

NOTE:

1. THESE DATA MEASURED AFTER FOURTEEN DAYS OF PUMPING FROM MIDDLE/DEEP OVERBURDEN PUMPING WELL RW-13 AND SEVEN DAYS OF PUMPING FROM SHALLOW/DEEP BEDROCK PUMPING WELL RW-1R.

LOCATION MAP

1000' 0 1000'

Original includes color coding.

B — B'

CROSS SECTION B-B'

HORIZONTAL SCALE:
400' 0 400'

X: 08331X01, 08331X03.DWG
L: ON=*, OFF=*REF*
P: DJB.PCP
10/15/99 SYR-54-DMW
08331012/GW/08331VB3.DWG

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
NTCRA 2

GEOLOGIC CROSS SECTION B-B' WITH DRAWDOWN CONTOURS, 7/21/99 - 7/28/99 (RW-13 AND RW-1R PUMPING)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE A-5

Original includes color coding.

ESTIMATED RW-13 CAPTURE-ZONE BOUNDARY (SEE NOTE 3)

ESTIMATED NTCRA 1 BEDROCK CAPTURE-ZONE (BBL, NOV. 1998)

NTCRA 1 CONTAINMENT AREA

OPERATIONS AREA

CMP EASEMENT

IVY DRIVE

FAWN ROAD

HART STREET

KANE STREET

CURTISS STREET

INTERMITTENT STREAM

NORTH MAIN STREET

QUINNIPIAC RIVER

(CONN. ROUTE 10)

QUEEN STREET

LAZY LANE

FLANDERS STREET

FORMER IDEAL FORGING

MW-129 PZR-6 205.2 PZR-5 MW-209A 175.2 PZR-7 P-15 <160.75 P-8A 168.7 P-4A P-2A 156.2 P-1A MW-126C MW-801R 146.4 MW-128 145.9 MW-124C 180.1 CPZ-2R 154.8 CPZ-1R MW-416 150.9 MW-414 MW-123A MW-01 147.7 PW-406 MW-411 MW-408 CPZ-9R CPZ-10R CPZ-7R CPZ-4R 149.2 CPZ-3R 151.3 MW-125C CPZ-8R CPZ-5R P-5A CPZ-6R P-6 MW-705R 153.9 MW-709R 154.5 MW-12A PSR-5R 146.7 MW-02 145.3 PZR-4R 145.6 MW-127C 145.2 MW-205A 145.3 MW-707R 145.0 PZR-2R 145.3 RW-1R 145.3 MW-04 RW-13 MW-704R 142.8 141.8 MW-121C MW-121A 146.2 MW-204A 145.1 PZR-1R 147.4 PZR-3R 145.4 MW-206A 145.7 FORMER IDEAL FORGING MW-208A 146.4 MW-710R 146.4 MW-203A 149.4 MW-05 P-14 146.9 P-11A P-3A P-101A 146.9 P-102A MW-501A 147.1 MW-708R 149.2 MW-202A MW-201A

LEGEND:

- MIDDLE/DEEP OVERBURDEN PUMPING WELL
- BEDROCK PUMPING WELL
- SHALLOW BEDROCK MONITORING WELL/PIEZOMETER
- SHALLOW BEDROCK PIEZOMETER (NTCRA 1)
- OVERBURDEN/BEDROCK INTERFACE MONITORING WELL
- 157.5 MEASURED GROUND-WATER (POTENTIOMETRIC) ELEVATION (FT AMSL)
- 160 GROUND-WATER (POTENTIOMETRIC) ELEVATION CONTOUR (FT AMSL), DASHED WHERE INFERRED, CONTOUR INTERVAL VARIES

0 300' 600'

NOTES:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.
2. GROUND-WATER ELEVATION DATA MEASURED AFTER SEVEN DAYS OF PUMPING FROM MIDDLE/DEEP OVERBURDEN PUMPING WELL RW-13 (Q=22.5 GPM).
3. ESTIMATED RW-13 CAPTURE ZONE BASED ON SIMULATION RESULTS (BBL, NOVEMBER 1998) AND STAGNATION POINT CALCULATION (BBL, NOVEMBER 1998 AND THIS DOCUMENT).

X: 08325X00, 08325X01.DWG
L: ON=*, OFF=*REF*
P: STD-DL.PCP @ E-SIZE OR DJB.PCP
10/15/99 SYR-54-PGL DMW GMS
08331012/GW/08331W05.DWG

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

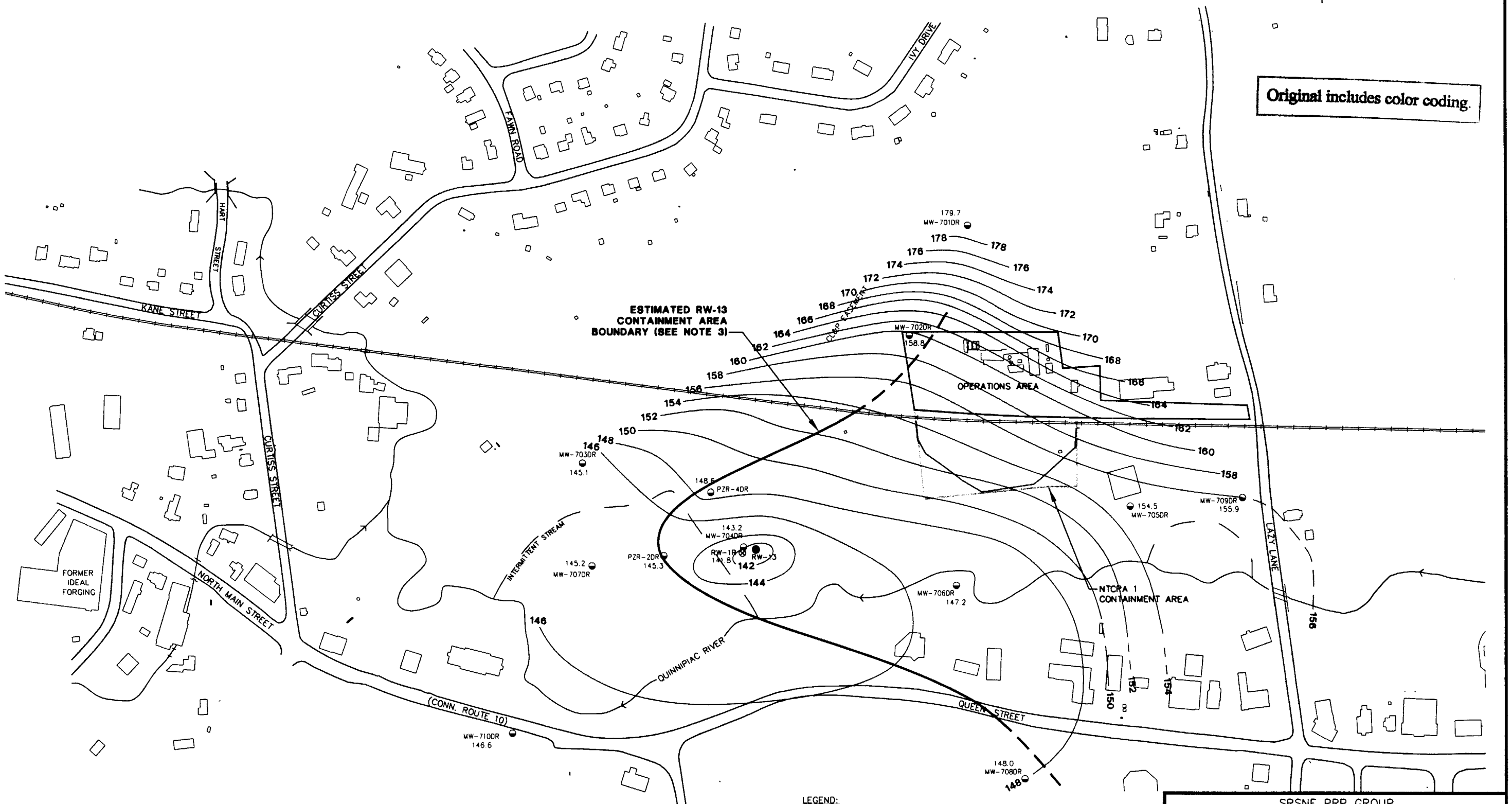
NTCRA 2

SHALLOW BEDROCK GROUND-WATER ELEVATION CONTOURS, 7/21/99 (RW-13 PUMPING)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE A-6

Original includes color coding.



NOTES:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.
2. GROUND-WATER ELEVATION DATA MEASURED AFTER SEVEN DAYS OF PUMPING FROM MIDDLE/DEEP OVERBURDEN PUMPING WELL RW-13 (Q=22.5 GPM).
3. ESTIMATED RW-13 CONTAINMENT AREA BASED ON SIMULATION RESULTS (BBL, NOVEMBER 1998) AND STAGNATION POINT CALCULATION (BBL, NOVEMBER 1998 AND THIS DOCUMENT).

LEGEND:

- ● MIDDLE/DEEP OVERBURDEN PUMPING WELL
- ⊗ BEDROCK PUMPING WELL
- ◒ DEEP BEDROCK MONITORING WELL/PIEZOMETER
- 157.5 GROUND-WATER (POTENTIOMETRIC) ELEVATION (FT AMSL)
- 160 —— GROUND-WATER (POTENTIOMETRIC) ELEVATION CONTOUR (FT AMSL), DASHED WHERE INFERRED, CONTOUR INTERVAL VARIES

0 300' 600'

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

NTCRA 2

DEEP BEDROCK GROUND-WATER ELEVATION CONTOURS, 7/21/99 (RW-13 PUMPING)

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE A-7

x: 08331XN2, 08325X01.DWG
L: ON=*, OFF=*REF*
P: STD-DL.PCP @ E-SIZE OR DJB.PCP
10/15/99 SYR-54-PGL DMW GMS
08331012/GW/08331W06.DWG

SOUTH
B

NORTH
B'

FORMER IDEAL FORGING PROPERTY

TOWN WELL FIELD PROPERTY

FORMER CIANCI PROPERTY

MW-208A DARLING STREET

TRIBUTARY STREAM

NORTH MAIN STREET

MW-206B MW-206A CURTISS STREET

QUINNIPIAC RIVER

QUINNIPIAC RIVER

MW-205B MW-205A

MW-707S MW-707M MW-707R MW-707DR

PZO-2M PZO-2D PZR-2R PZR-2DR

MW-704S MW-704M MW-704D MW-704R MW-704DR

RW-1R

RW-13

MW-121B MW-121C MW-121A

MW-07 MW-06 MW-05

QUINNIPIAC RIVER P-101C P-101B P-101A

MW-706DR

QUINNIPIAC RIVER P-102C P-102B P-102A

QUINNIPIAC RIVER

DP-4

MW-705D MW-705R MW-705DR P-7

MW-709R MW-709DR

LAZY LANE

TW-12

OUTWASH

GRAVELLY DRIFT

SILTY TILL

BEDROCK

BEDROCK

ESTIMATED RW-13 CONTAINMENT AREA BOUNDARY

ELEVATION IN FEET

CROSS SECTION B-B'

HORIZONTAL SCALE:
400' 0 400'

LEGEND

- MW-125A — WELL NUMBER
- MONITORING WELL
- ESTIMATED WATER TABLE
- 152 — GROUND-WATER ELEVATION (HEAD) CONTOUR, JULY 21, 1999 INTERVAL VARIABLE
- 154.3 — GROUND-WATER ELEVATION MEASURED JULY 21, 1999
- SCREENED INTERVAL
- OPEN BEDROCK BOREHOLE INTERVAL (RW-1R)
- BOTTOM OF BORING

NOTE:
1. THESE DATA MEASURED AFTER SEVEN DAYS OF PUMPING FROM MIDDLE/DEEP OVERBURDEN PUMPING WELL RW-13.

LOCATION MAP

1000' 0 1000'

Original includes color coding.

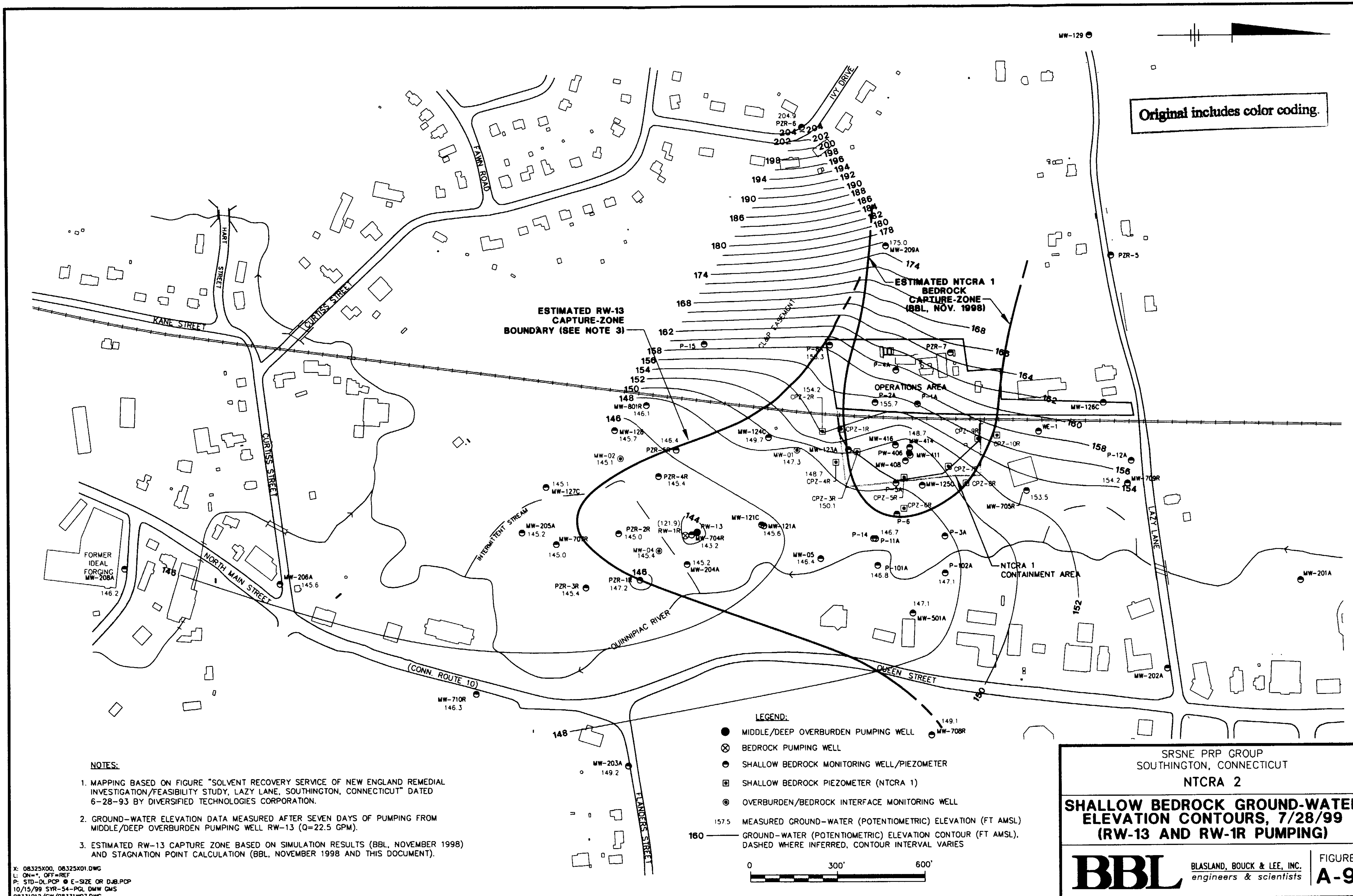
X: 08331X01, 08331X03.DWG
L: ON=*, OFF=REF
P: DJB
10/15/99 SYR-54-DMW GMS
08331013/08331VB1.DWG

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
NTCRA 2

GEOLOGIC CROSS SECTION B-B' WITH HEAD CONTOURS, 7/21/99 (RW-13 PUMPING)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE A-8



NOTES:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.
2. GROUND-WATER ELEVATION DATA MEASURED AFTER SEVEN DAYS OF PUMPING FROM MIDDLE/DEEP OVERBURDEN PUMPING WELL RW-13 (Q=22.5 GPM).
3. ESTIMATED RW-13 CAPTURE ZONE BASED ON SIMULATION RESULTS (BBL, NOVEMBER 1998) AND STAGNATION POINT CALCULATION (BBL, NOVEMBER 1998 AND THIS DOCUMENT).

LEGEND:

- MIDDLE/DEEP OVERBURDEN PUMPING WELL
- BEDROCK PUMPING WELL
- SHALLOW BEDROCK MONITORING WELL/PIEZOMETER
- SHALLOW BEDROCK PIEZOMETER (NTCRA 1)
- OVERBURDEN/BEDROCK INTERFACE MONITORING WELL
- 157.5 MEASURED GROUND-WATER (POTENTIOMETRIC) ELEVATION (FT AMSL)
- 160 GROUND-WATER (POTENTIOMETRIC) ELEVATION CONTOUR (FT AMSL), DASHED WHERE INFERRED, CONTOUR INTERVAL VARIES

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

NTCRA 2

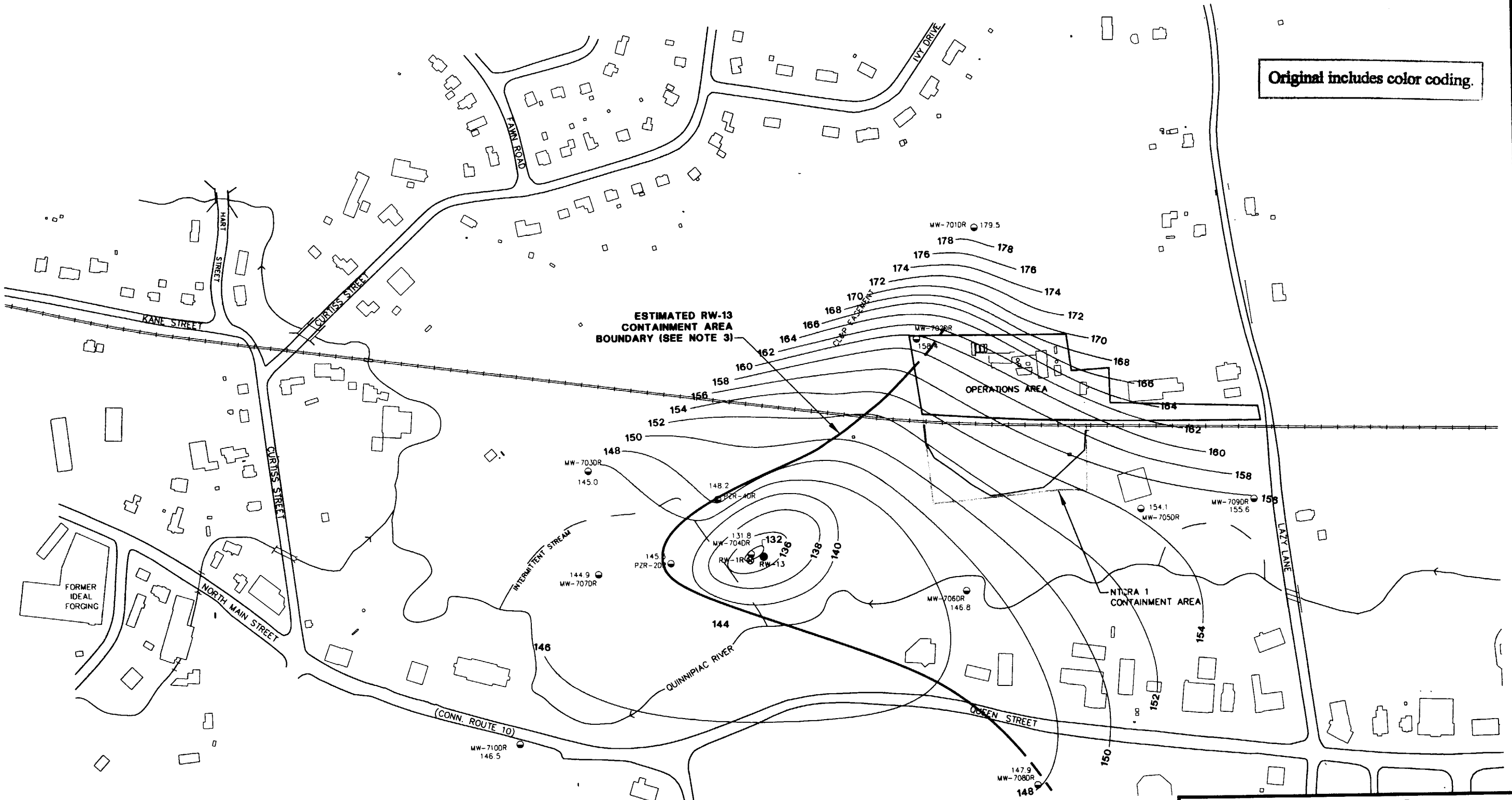
SHALLOW BEDROCK GROUND-WATER ELEVATION CONTOURS, 7/28/99 (RW-13 AND RW-1R PUMPING)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE A-9

X: 08325X00, 08325X01.DWG
L: ON=*, OFF=REF
P: STD-DL.PCP @ E-SIZE OR DJB.PCP
10/15/99 SYR-54-PGL DMW GMS
08331012/GW/08331W07.DWG

Original includes color coding.



NOTES:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.
2. GROUND-WATER ELEVATION DATA MEASURED AFTER SEVEN DAYS OF PUMPING FROM MIDDLE/DEEP OVERBURDEN PUMPING WELL RW-13 (Q=22.5 GPM).
3. ESTIMATED RW-13 CONTAINMENT AREA BASED ON SIMULATION RESULTS (BBL, NOVEMBER 1998) AND STAGNATION POINT CALCULATION (BBL, NOVEMBER 1998 AND THIS DOCUMENT).

LEGEND:

- MIDDLE/DEEP OVERBURDEN PUMPING WELL
- BEDROCK PUMPING WELL
- DEEP BEDROCK MONITORING WELL/PIEZOMETER
- 157.5 GROUND-WATER (POTENTIOMETRIC) ELEVATION (FT AMSL)
- 160 GROUND-WATER (POTENTIOMETRIC) ELEVATION CONTOUR (FT AMSL), DASHED WHERE INFERRED, CONTOUR INTERVAL VARIES

0 300' 600'

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

NTCRA 2

DEEP BEDROCK GROUND-WATER ELEVATION CONTOURS, 7/28/99 (RW-13 AND RW-1R PUMPING)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE A-10

X: 08331XN2, 08325X01.DWG
L: ON=*, OFF=REF
P: STD-DL.PCP @ E-SIZE OR DJB.PCP
10/15/99 SYR-54-PGL DMW GMS
08331012/GW/08331W04.DWG

SOUTH
B

NORTH
B'

FORMER IDEAL FORGING PROPERTY

TOWN WELL FIELD PROPERTY

FORMER CIANCI PROPERTY

MW-208A
DARLING STREET
TRIBUTARY STREAM
NORTH MAIN STREET
MW-206B
MW-206A
CURTISS STREET
QUINNIPIAC RIVER
QUINNIPIAC RIVER
MW-205B
MW-205A
MW-707S
MW-707M
MW-707D
MW-707R
MW-707DR
PZO-2M
PZR-2D
PZR-2R
PZR-20R
MW-704S
MW-704M
MW-704D
MW-704R
MW-704DR
RW-1R
RW-13
MW-121B
MW-121C
MW-121A
MW-07
MW-06
MW-05
QUINNIPIAC RIVER
P-101C
P-101B
P-101A
MW-706DR
QUINNIPIAC RIVER
QUINNIPIAC RIVER
P-102C
P-102B
P-102A
QUINNIPIAC RIVER
DP-4
MW-705D
MW-705R
MW-705DR
P-7
MW-709R
MW-709DR
LAZY LANE
TW-12

OUTWASH

GRAVELLY DRIFT

SILTY TILL

BEDROCK

BEDROCK

ESTIMATED RW-13 AND RW-1R CONTAINMENT AREA BOUNDARY

ELEVATION IN FEET

LEGEND

MW-125A — WELL NUMBER

MONITORING WELL

ESTIMATED WATER TABLE

GROUND-WATER ELEVATION (HEAD) CONTOUR, JULY 28, 1999 INTERVAL VARIABLE

154.3 — GROUND-WATER ELEVATION MEASURED JULY 28, 1999

SCREENED INTERVAL

OPEN BEDROCK BOREHOLE INTERVAL (RW-1R)

BOTTOM OF BORING

NOTE:

1. THESE DATA MEASURED AFTER FOURTEEN DAYS OF PUMPING FROM MIDDLE/DEEP OVERBURDEN PUMPING WELL RW-13 AND SEVEN DAYS OF PUMPING FROM SHALLOW/DEEP BEDROCK PUMPING WELL RW-1R.

LOCATION MAP

1000' 0 1000'

Original includes color coding.

CROSS SECTION B-B'

HORIZONTAL SCALE:
400' 0 400'

x: 08331X01, 08331X03.DWG
L: ON=*, OFF=REF
P: DJB
10/15/99 SYR-54-DMW GMS
08331012/GW/08331VB2.DWG

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

NTCRA 2

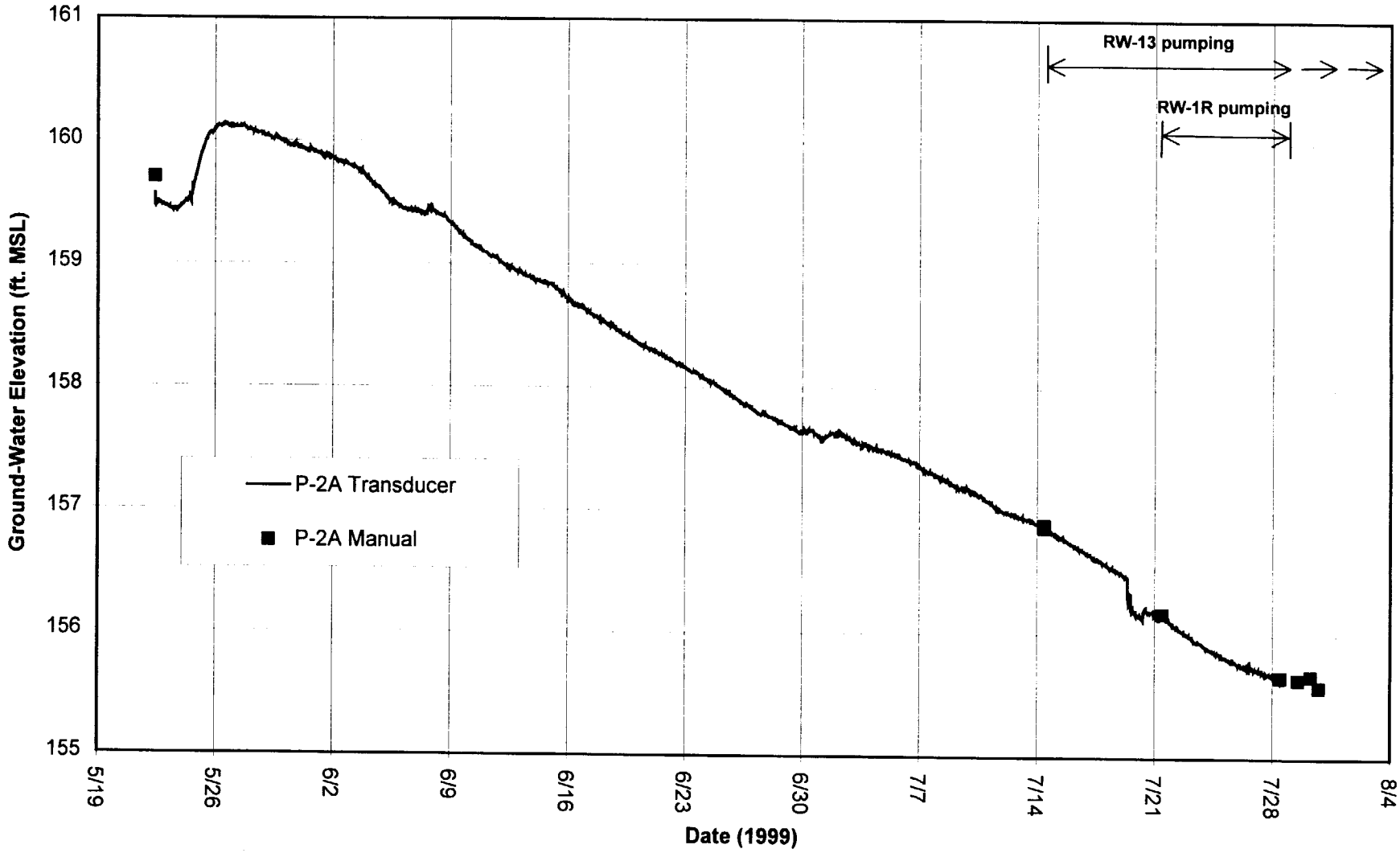
GEOLOGIC CROSS SECTION B-B' WITH HEAD CONTOURS, 7/28/99 (RW-13 AND RW-1R PUMPING)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE A-11

ATTACHMENT A - 1

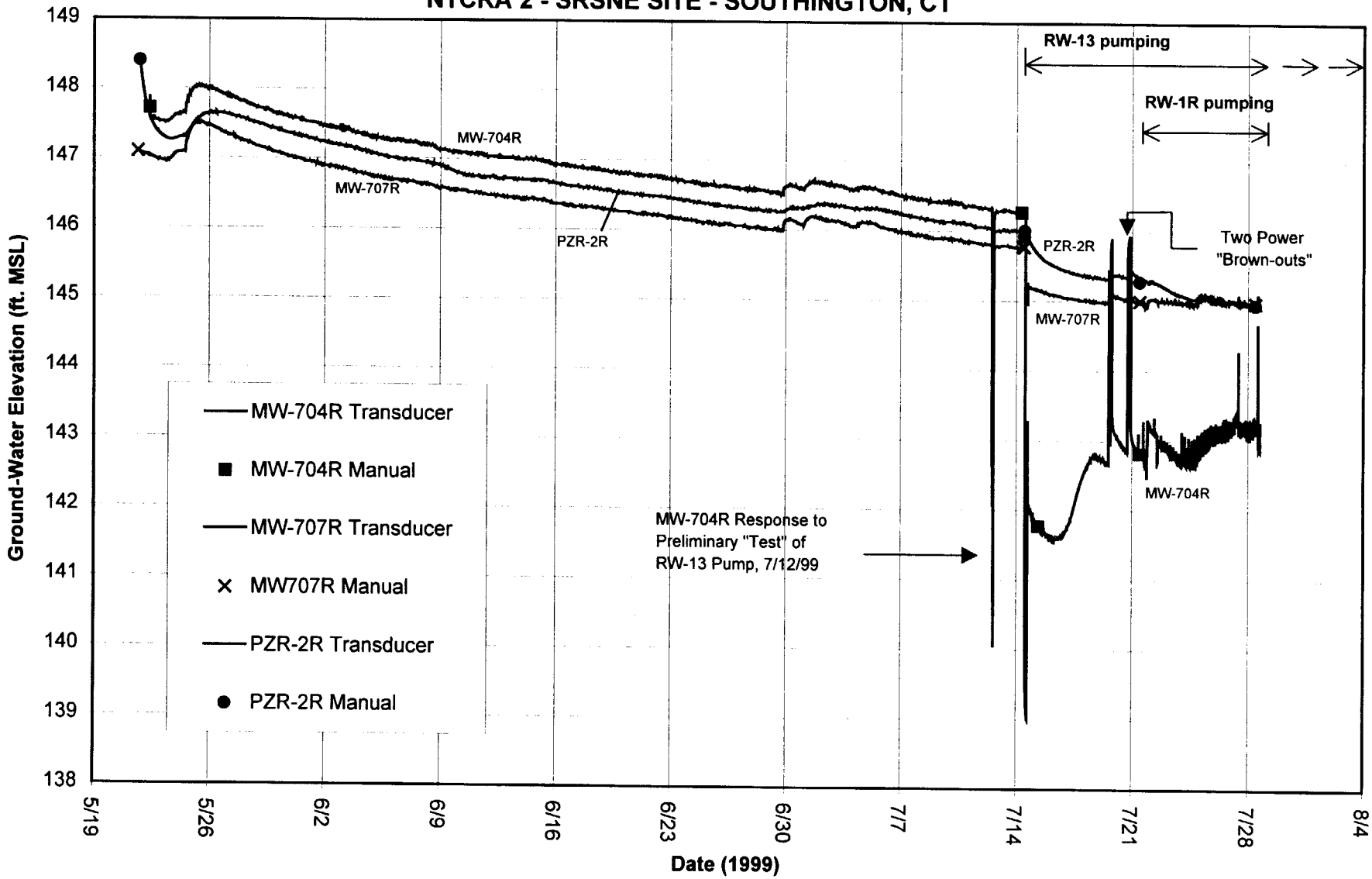
HYDROGRAPH FOR WELL P-2A
NTCRA 2 - SRSNE SITE - SOUTHINGTON, CT



J:\Srs\Pt99\Testdata.xls

8/24/99

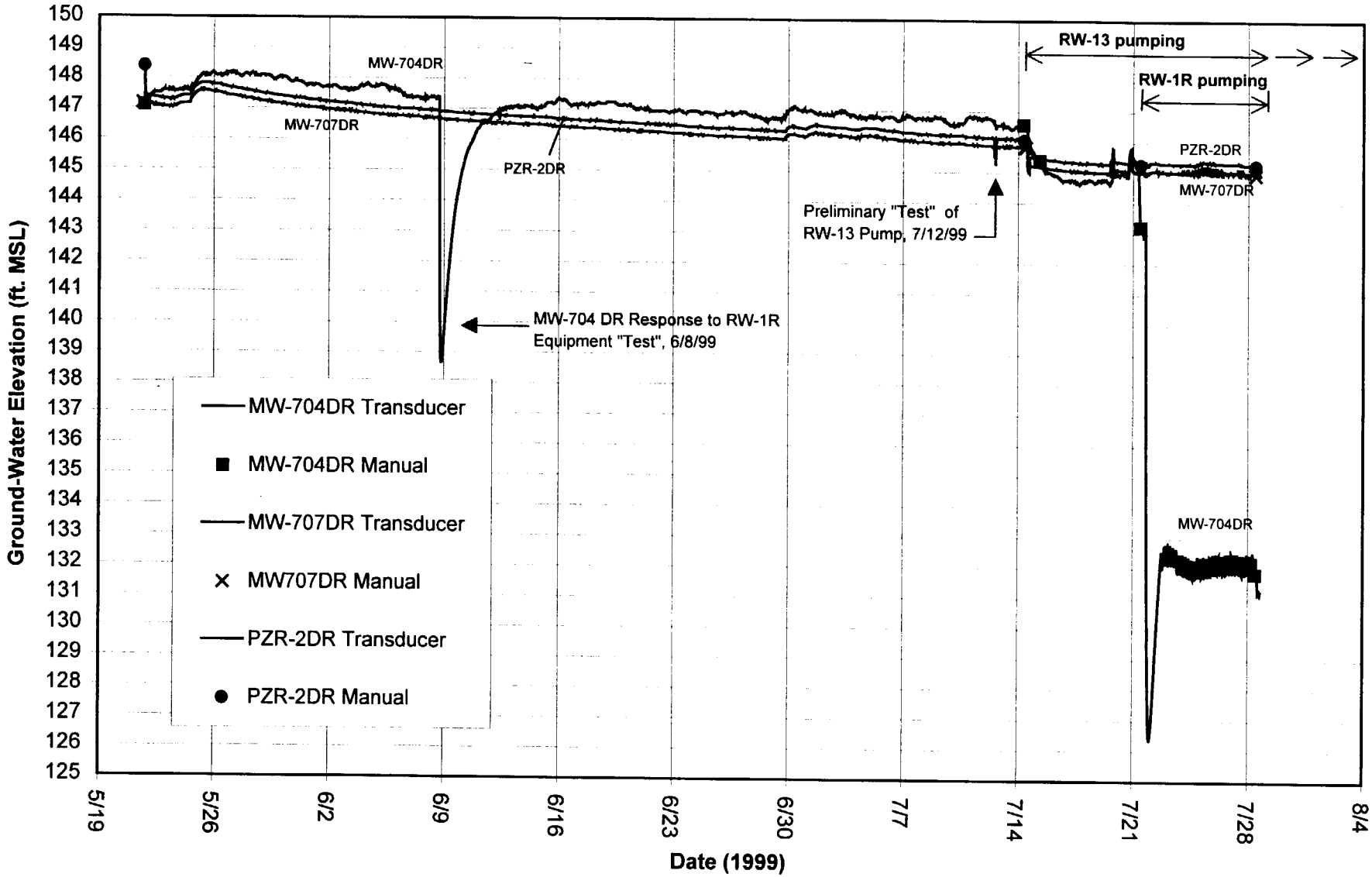
HYDROGRAPH FOR SHALLOW BEDROCK WELLS MW-704R, MW-707R, and PZR-2R
NTCRA 2 - SRSNE SITE - SOUTHINGTON, CT



J:\Srs\Pt99\Testdata.xls

8/24/99

HYDROGRAPH FOR DEEP BEDROCK WELLS MW-704DR, MW-707DR, and PZR-2DR
NTCRA 2 - SRSNE SITE - SOUTHINGTON, CT



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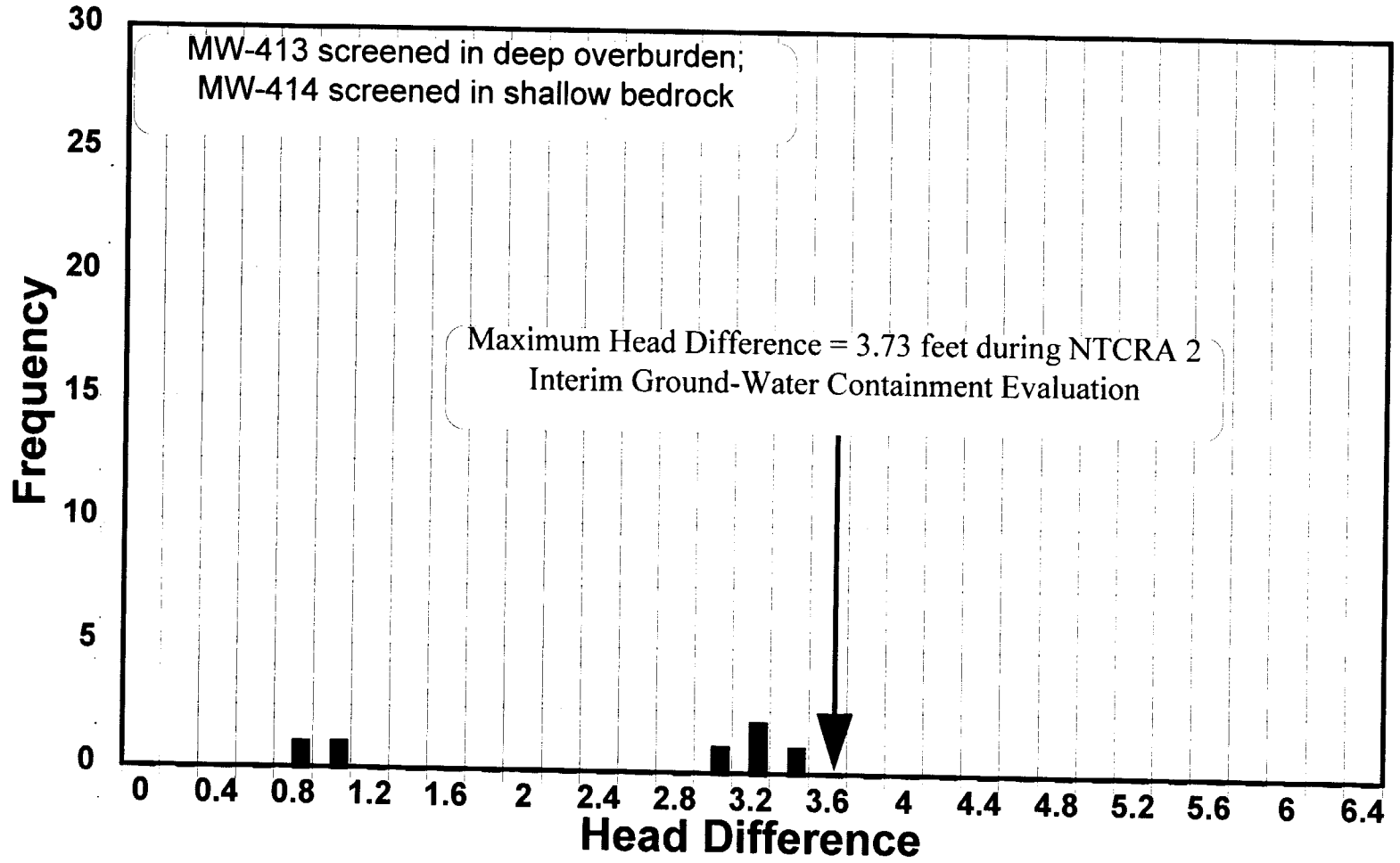
8/24/99

ATTACHMENT A - 2

Head Differences at MW-413/MW-414

NTCRA 2 -- SRSNE -- Southington, CT



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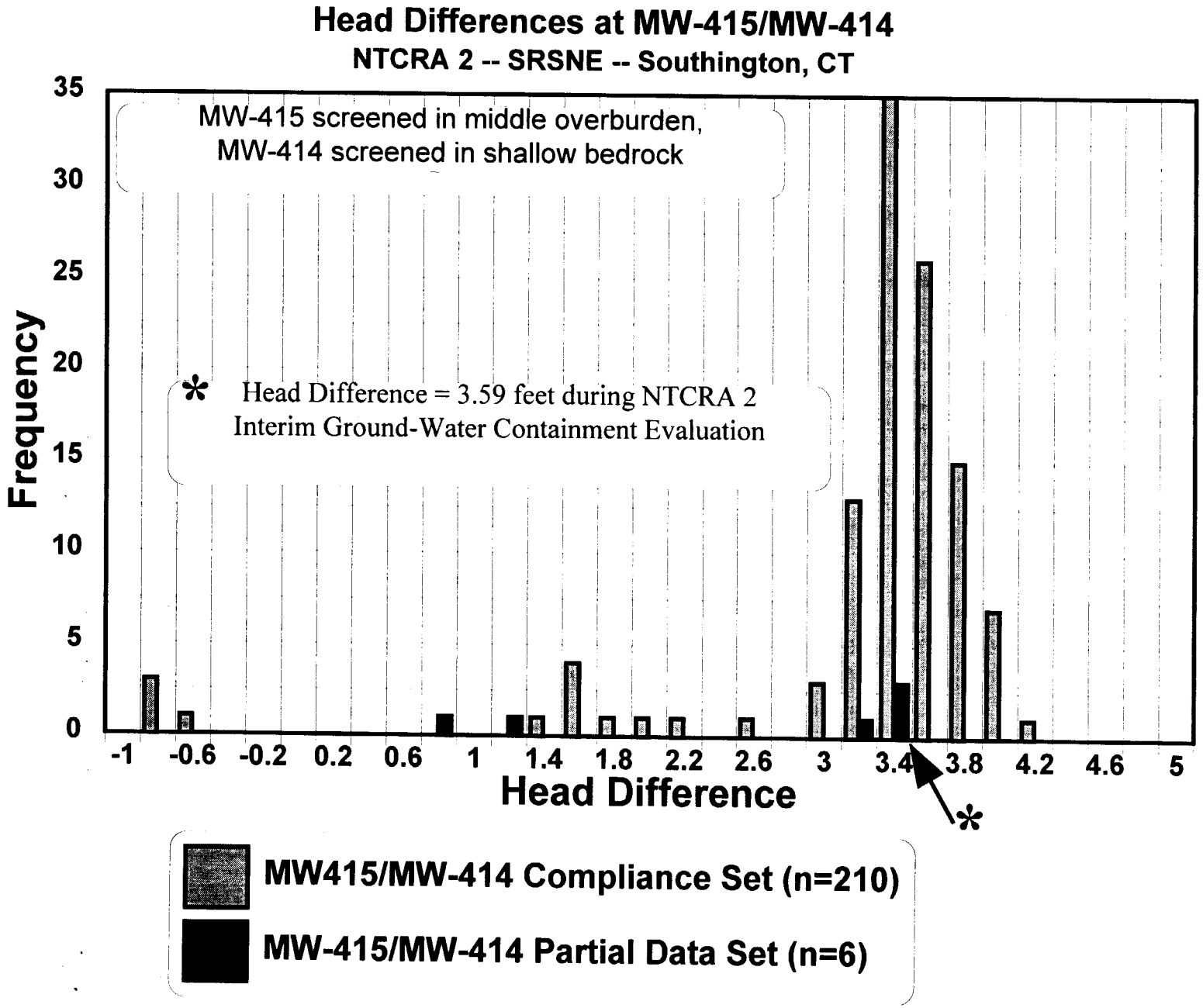
14-Oct-99

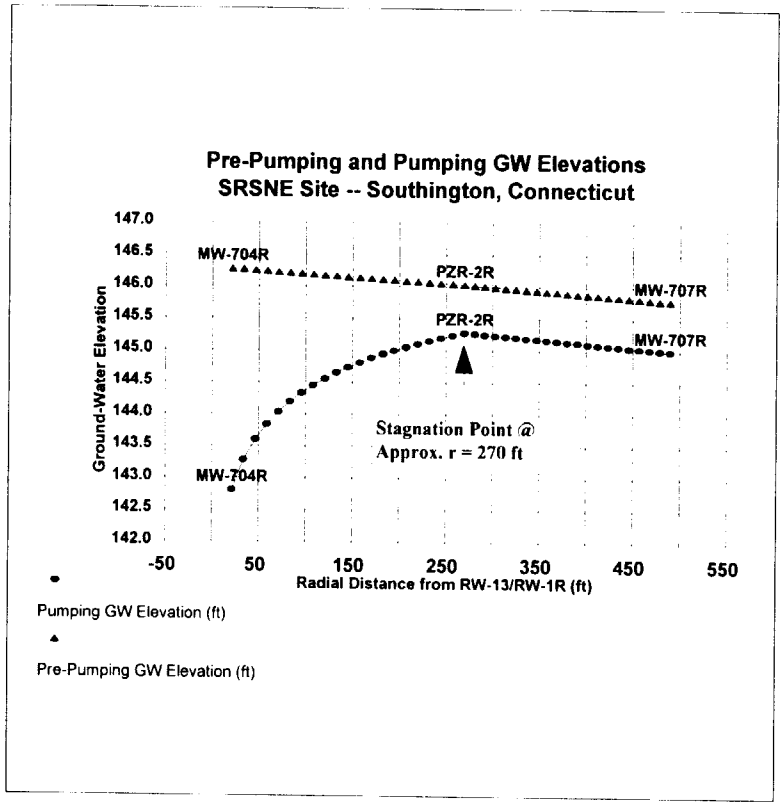

Head Differences at MW-415/MW-414
NTCRA 2 -- SRSNE -- Southington, CT
MW-415 screened in middle overburden,
MW-414 screened in shallow bedrock
* Head Difference = 3.59 feet during NTCRA 2
Interim Ground-Water Containment Evaluation
Frequency
35
30
25
20
15
10
5
0
-1
-0.6
-0.2
0.2
0.6
1
1.4
1.8
2.2
2.6
3
3.4
3.8
4.2
4.6
5
Head Difference
*
MW415/MW-414 Compliance Set (n=210)
MW-415/MW-414 Partial Data Set (n=6)

ATTACHMENT A - 3

SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

ESTIMATED STAGNATION POINT LOCATION -- RW-13 PUMPING ALONE
SHALLOW BEDROCK

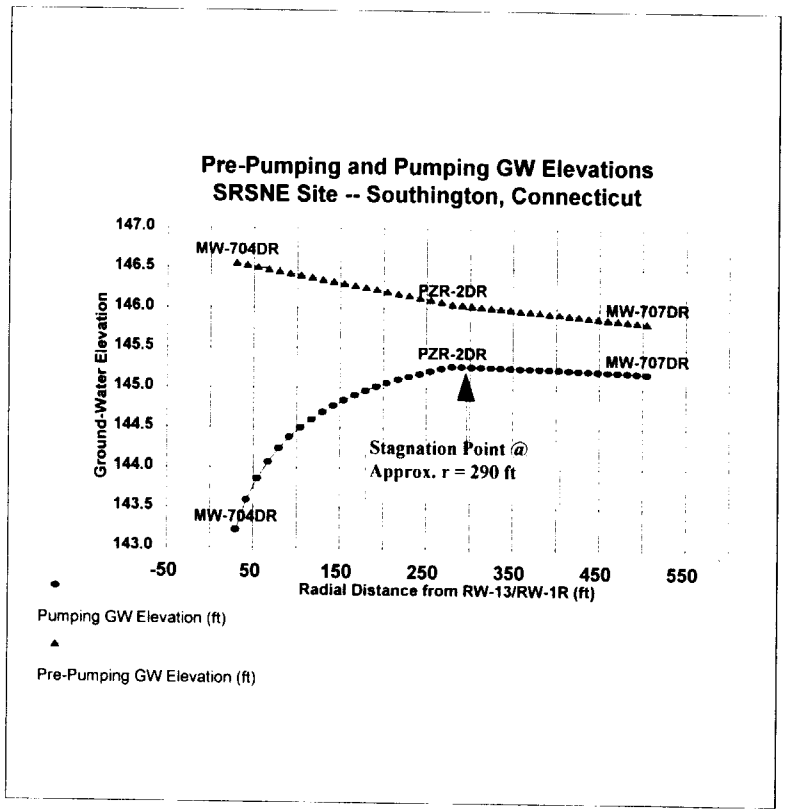
	r (ft)	log r (ft)	Pre-Pump GW Elev.	Drawdown	Pumping GW Elev.	
MW-704R	22.0	1.34	146.27	3.46	142.81	"Upgradient"
	34.4	1.54	146.26	2.98	143.28	Observation
	46.8	1.67	146.25	2.64	143.60	Well
	59.2	1.77	146.23	2.39	143.84	
	71.6	1.85	146.22	2.18	144.04	
	84.0	1.92	146.21	2.01	144.20	
	96.4	1.98	146.20	1.86	144.33	
	108.8	2.04	146.19	1.73	144.45	
	121.2	2.08	146.17	1.62	144.56	
	133.6	2.13	146.16	1.51	144.65	
	146.0	2.16	146.15	1.41	144.74	
	158.4	2.20	146.14	1.33	144.81	
	170.8	2.23	146.13	1.24	144.88	
	183.2	2.26	146.11	1.17	144.94	
	195.6	2.29	146.10	1.10	145.00	
	208.0	2.32	146.09	1.03	145.06	
	220.4	2.34	146.08	0.97	145.11	
	232.8	2.37	146.07	0.91	145.16	Stagnation Point @
	245.2	2.39	146.05	0.85	145.20	Approx. r = 270 ft.
	257.6	2.41	146.04	0.80	145.24	
PZR-2R	270.0	2.43	146.03	0.75	145.28	"Middle"
	281.0	2.45	146.02	0.75	145.27	Observation
	292.0	2.47	146.01	0.75	145.25	Well
	303.0	2.48	145.99	0.76	145.24	
	314.0	2.50	145.98	0.76	145.22	
	325.0	2.51	145.97	0.76	145.21	
	336.0	2.53	145.96	0.76	145.19	
	347.0	2.54	145.94	0.76	145.18	
	358.0	2.55	145.93	0.76	145.17	
	369.0	2.57	145.92	0.77	145.15	
	380.0	2.58	145.91	0.77	145.14	
	391.0	2.59	145.89	0.77	145.12	
	402.0	2.60	145.88	0.77	145.11	
	413.0	2.62	145.87	0.77	145.10	
	424.0	2.63	145.86	0.77	145.08	
	435.0	2.64	145.84	0.77	145.07	
	446.0	2.65	145.83	0.78	145.05	
	457.0	2.66	145.82	0.78	145.04	
	468.0	2.67	145.81	0.78	145.03	"Downgradient"
	479.0	2.68	145.79	0.78	145.01	Observation
MW-707R	490.0	2.69	145.78	0.78	145.00	Well



SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

ESTIMATED STAGNATION POINT LOCATION -- RW-13 PUMPING ALONE
DEEP BEDROCK

	r (ft)	log r (ft)	Pre-Pump GW Elev.	Drawdown	Pumping GW Elev.	
MW-704DR	30.0	1.48	146.56	3.34	143.22	"Upgradient"
	42.5	1.63	146.54	2.94	143.59	Observation
	55.0	1.74	146.51	2.65	143.86	Well
	67.5	1.83	146.49	2.41	144.07	
	80.0	1.90	146.46	2.22	144.24	
	92.5	1.97	146.44	2.05	144.38	
	105.0	2.02	146.41	1.91	144.50	
	117.5	2.07	146.38	1.78	144.60	
	130.0	2.11	146.36	1.67	144.69	
	142.5	2.15	146.33	1.56	144.77	
	155.0	2.19	146.31	1.47	144.84	
	167.5	2.22	146.28	1.38	144.91	
	180.0	2.26	146.26	1.29	144.97	
	192.5	2.28	146.23	1.22	145.02	
	205.0	2.31	146.21	1.15	145.06	
	217.5	2.34	146.18	1.08	145.11	
	230.0	2.36	146.16	1.01	145.15	
	242.5	2.38	146.13	0.95	145.18	
	255.0	2.41	146.11	0.90	145.21	Stagnation Point @
	267.5	2.43	146.08	0.84	145.24	Approx. r = 290 ft.
PZR-2DR	280.0	2.45	146.06	0.79	145.27	"Middle"
	291.3	2.46	146.05	0.78	145.27	Observation
	302.5	2.48	146.04	0.77	145.27	Well
	313.8	2.50	146.03	0.76	145.26	
	325.0	2.51	146.01	0.75	145.26	
	336.3	2.53	146.00	0.74	145.26	
	347.5	2.54	145.99	0.74	145.26	
	358.8	2.55	145.98	0.73	145.25	
	370.0	2.57	145.97	0.72	145.25	
	381.3	2.58	145.96	0.71	145.25	
	392.5	2.59	145.94	0.70	145.24	
	403.8	2.61	145.93	0.70	145.24	
	415.0	2.62	145.92	0.69	145.23	
	426.3	2.63	145.91	0.68	145.23	
	437.5	2.64	145.90	0.68	145.22	
	448.8	2.65	145.89	0.67	145.22	
	460.0	2.66	145.88	0.66	145.21	
	471.3	2.67	145.86	0.66	145.21	
	482.5	2.68	145.85	0.65	145.20	"Downgradient"
	493.8	2.69	145.84	0.65	145.20	Observation
MW-707DR	505.0	2.70	145.83	0.64	145.19	Well



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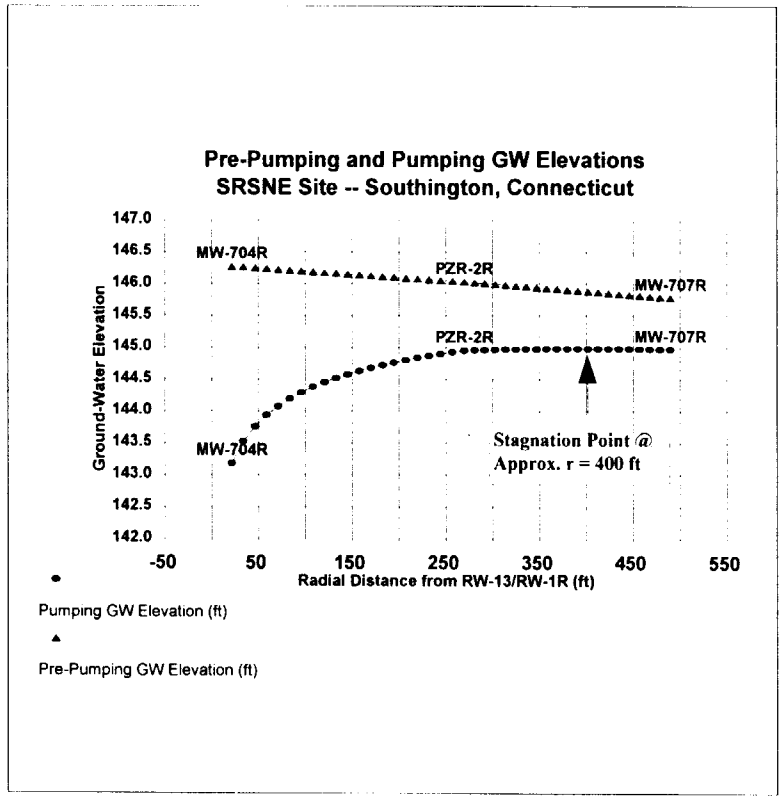
05-Oct-99

SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

ESTIMATED STAGNATION POINT LOCATION -- RW-13 AND RW-1R PUMPING
SHALLOW BEDROCK

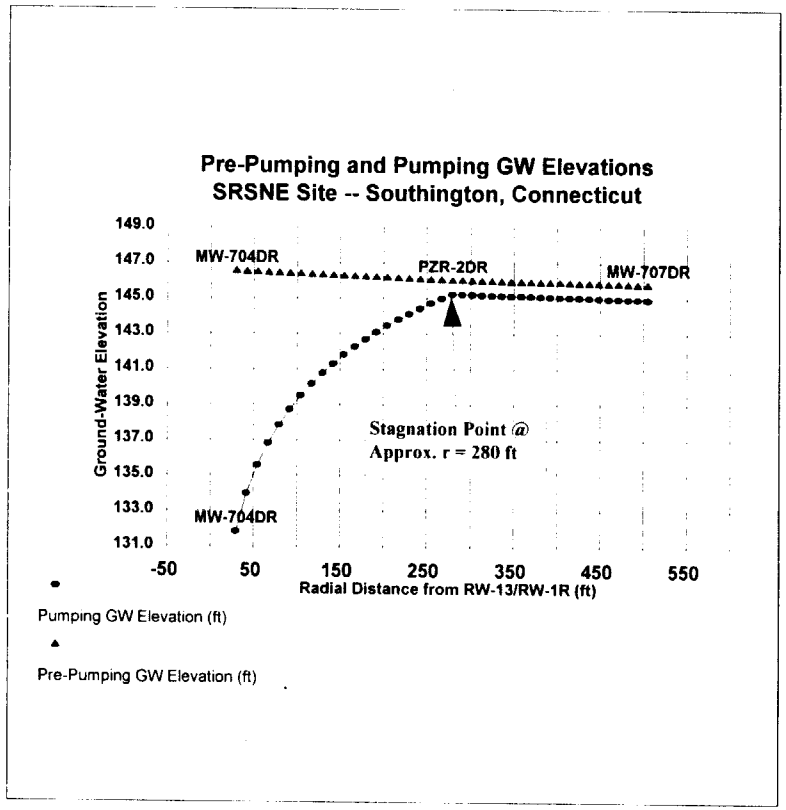
	r (ft)	log r (ft)	Pre-Pump GW Elev.	Drawdown	Pumping GW Elev.	
MW-704R	22.0	1.34	146.27	3.09	143.18	"Upgradient"
	34.4	1.54	146.26	2.73	143.53	Observation
	46.8	1.67	146.25	2.48	143.76	Well
	59.2	1.77	146.23	2.30	143.94	
	71.6	1.85	146.22	2.14	144.08	
	84.0	1.92	146.21	2.02	144.19	
	96.4	1.98	146.20	1.91	144.29	
	108.8	2.04	146.19	1.81	144.38	
	121.2	2.08	146.17	1.72	144.45	
	133.6	2.13	146.16	1.64	144.52	
	146.0	2.16	146.15	1.57	144.58	
	158.4	2.20	146.14	1.51	144.63	
	170.8	2.23	146.13	1.45	144.68	
	183.2	2.26	146.11	1.39	144.72	
	195.6	2.29	146.10	1.34	144.76	
	208.0	2.32	146.09	1.29	144.80	
	220.4	2.34	146.08	1.24	144.84	
	232.8	2.37	146.07	1.20	144.87	
	245.2	2.39	146.05	1.16	144.90	
	257.6	2.41	146.04	1.12	144.92	
PZR-2R	270.0	2.43	146.03	1.08	144.95	"Middle"
	281.0	2.45	146.02	1.06	144.96	Observation
	292.0	2.47	146.01	1.04	144.96	Well
	303.0	2.48	145.99	1.03	144.96	
	314.0	2.50	145.98	1.01	144.97	
	325.0	2.51	145.97	1.00	144.97	
	336.0	2.53	145.96	0.98	144.97	
	347.0	2.54	145.94	0.97	144.98	
	358.0	2.55	145.93	0.95	144.98	
	369.0	2.57	145.92	0.94	144.98	
	380.0	2.58	145.91	0.93	144.98	
	391.0	2.59	145.89	0.91	144.98	
	402.0	2.60	145.88	0.90	144.98	Stagnation Point @
	413.0	2.62	145.87	0.89	144.98	Approx. r = 400 ft.
	424.0	2.63	145.86	0.88	144.98	
	435.0	2.64	145.84	0.86	144.98	
	446.0	2.65	145.83	0.85	144.98	
	457.0	2.66	145.82	0.84	144.98	
	468.0	2.67	145.81	0.83	144.97	"Downgradient"
	479.0	2.68	145.79	0.82	144.97	Observation
MW-707R	490.0	2.69	145.78	0.81	144.97	Well



SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA 2 INTERIM GROUND-WATER CONTAINMENT EVALUATION

ESTIMATED STAGNATION POINT LOCATION -- RW-13 AND RW-1R PUMPING
DEEP BEDROCK

	r (ft)	log r (ft)	Pre-Pump GW Elev.	Drawdown	Pumping GW Elev.	
MW-704DR	30.0	1.48	146.56	14.72	131.84	"Upgradient"
	42.5	1.63	146.54	12.55	133.98	Observation
	55.0	1.74	146.51	10.95	135.56	Well
	67.5	1.83	146.49	9.67	136.82	
	80.0	1.90	146.46	8.61	137.85	
	92.5	1.97	146.44	7.71	138.73	
	105.0	2.02	146.41	6.92	139.49	
	117.5	2.07	146.38	6.22	140.17	
	130.0	2.11	146.36	5.59	140.77	
	142.5	2.15	146.33	5.02	141.32	
	155.0	2.19	146.31	4.49	141.82	
	167.5	2.22	146.28	4.01	142.28	
	180.0	2.26	146.26	3.56	142.70	
	192.5	2.28	146.23	3.14	143.09	
	205.0	2.31	146.21	2.75	143.46	
	217.5	2.34	146.18	2.38	143.80	
	230.0	2.36	146.16	2.04	144.12	
	242.5	2.38	146.13	1.71	144.43	
	255.0	2.41	146.11	1.39	144.72	Stagnation Point @
	267.5	2.43	146.08	1.09	144.99	Approx. r = 280 ft.
PZR-2DR	280.0	2.45	146.06	0.81	145.25	"Middle"
	291.3	2.46	146.05	0.82	145.23	Observation
	302.5	2.48	146.04	0.82	145.22	Well
	313.8	2.50	146.03	0.83	145.20	
	325.0	2.51	146.01	0.83	145.18	
	336.3	2.53	146.00	0.83	145.17	
	347.5	2.54	145.99	0.84	145.15	
	358.8	2.55	145.98	0.84	145.14	
	370.0	2.57	145.97	0.85	145.12	
	381.3	2.58	145.96	0.85	145.10	
	392.5	2.59	145.94	0.86	145.09	
	403.8	2.61	145.93	0.86	145.07	
	415.0	2.62	145.92	0.86	145.06	
	426.3	2.63	145.91	0.87	145.04	
	437.5	2.64	145.90	0.87	145.03	
	448.8	2.65	145.89	0.87	145.01	
	460.0	2.66	145.88	0.88	145.00	
	471.3	2.67	145.86	0.88	144.98	
	482.5	2.68	145.85	0.88	144.97	"Downgradient"
	493.8	2.69	145.84	0.89	144.95	Observation
MW-707DR	505.0	2.70	145.83	0.89	144.94	Well



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05-Oct-99

ATTACHMENT A - 4

Galson Laboratories

6601 Kirkville Road
E. Syracuse, NY 13057-0369
Phone: (315) 432-5227
Fax: (315) 437-0571
www.galsonlabs.com

August 19, 1999

DOH ELAP# 11626

Mr. Mike Gefell
Blasland, Bouck & Lee
6723 Towpath Road
Box 66
Syracuse, NY 132101

Re: Client Account# 10624 Login # L53106

Dear Mr. Gefell:

Enclosed are the analytical results of the samples received by our laboratory July 29, 1999.

GC/MS Volatiles by 8260
Methylene chloride was detected in the samples as well as the associated method blank. These results have been flagged with a "B". This compound should not be considered as originally present in these samples.

Please contact our Client Services Department at (315) 437-7252, extension 116, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

Lynda W. Matt FOR

F. Joseph Unangst
Laboratory Director

Enclosure(s)

Galson Laboratories

6601 Kirkville Road East
E. Syracuse, New York 13057
315 437-7252 • 888-577-5227

Company Name: Blasland Bouck & Lee

Project Name / Number: SRSNE

Turn-Around Time
☒ - Standard Service
☐ - * Rush Service
Date requested by: _____
Ph # (315) - 446 - 9120
Fax # ( ) - -

Page 1 of 1

Send Report to: M. Ke Geffel
BBL
6723 Towpath Rd
Syracuse NY

Send Invoice to: Blasland Bouck & Lee Inc
6723 Towpath Rd
Syracuse N.Y. 13214

P.O. # 083.31.012

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE: Comp.	TYPE: Grab	Aqueous	Soil	Other	Laboratory ID Number	PARAMETERS FOR ANALYSIS: GC/MS VOA (8260)	Cu, Fe, Ni, Pb, Zn	TSS
RW13/RW1R	7/28	1410		✓	✓				✓	✓	✓
Trip Blanks	7/23										

REMARKS: 4 Trip Blanks

Total Containers - 10

SAMPLER'S NAME: Wayne DeCarr **SIGNATURE:** Wayne DeCarr

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: Wayne DeCarr SIGNATURE: Wayne DeCarr	DATE: 7/29/99 TIME: 10:05	NAME: M. Krause SIGNATURE: M. Krause	DATE: 7/29/99 TIME: 10:10
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: *(Signature)*	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: *(Signature)*	DATE: TIME:

VOC Pres U P AU NA

Custody Seal Intact? ☐ *Yes* ☐ *No* ☐ *N.A.*
Shipment Complete? ☐ *Yes* ☐ *No*

Temp _____ °C TS TB TM

Airbill #

VOLATILE ANALYTICAL REPORT

Galson Laboratories

Client : Blasland, Bouck & Lee
Account # : 10624
Site : SRSNE

Date Received : 29-JUL-99
Date Sampled : 28-JUL-99

Matrix : Water
Method : SW846 8260
Units : UG/L

Galson ID:	L53106-1	L53106-2	QCB072999-2
Client ID:	RW13/RW1R	TRIP BLANKS	Method Blank
Vinyl Chloride	<1	<1	<1
Acetone	<4	<4	<4
Methylene Chloride	11. B	10 B	13.
1,1-Dichloroethene	<1	<1	<1
1,2-Dichloroethene (Total)	5.	<2	<2
cis-1,2-Dichloroethene	5.	<1	<1
trans-1,2-Dichloroethene	<1	<1	<1
1,2-Dichloroethane	<0.9	<0.9	<0.9
2-Butanone	<3	<3	<3
1,1,1-Trichloroethane	<0.8	<0.8	<0.8
Trichloroethene	3.	<0.8	<0.8
1,1,2-Trichloroethane	<1	<1	<1
Benzene	4.	<0.3	<0.3
4-Methyl-2-Pentanone	<2	<2	<2
Tetrachloroethene	<1	<1	<1
Toluene	<1	<1	<1
Ethylbenzene	<0.3	<0.3	<0.3
Styrene	<0.8	<0.8	<0.8
Xylene (Total)	<0.7	<0.7	<0.7
Tetrahydrofuran	83.	<5	<5
Dilution Factor	1	1	1
Analysis Date	07/29/99	07/29/99	07/29/99

Approved by : PJT
Date : 18-AUG-99
QC by : [signature]
Date : 8/19/99
NYS DOH # : 11626
Footnotes:
B : This compound was also detected in the method blank.

WATER VOLATILE SURROGATE RECOVERY

Client : Blasland, Bouck & Lee

Login # : L53106

SAMPLE NO.	SMC1 (DCE) #	SMC2 (TOL) #	SMC3 (BFB) #	OTHER	TOT OUT
Method Blank-QCB072999-2	93	91	89	BC0729	0
TRIP BLANKS	97	93	92	BC0729	0
RW13/RW1R	110	99	100	BC0729	0

	QC LIMITS
SMC1 (DCE) = 1,2-Dichloroethane-d4	(58-134)
SMC2 (TOL) = Toluene-d8	(74-123)
SMC3 (BFB) = Bromofluorobenzene	(72-118)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

FORM II-CLP-1

Galson Laboratories

METALS ANALYTICAL REPORT

Client : Blasland, Bouck & Lee
Account # : 10624
Site : SRSNE

Date Received : 29-JUL-99
Date Sampled : 28-JUL-99

Matrix : Water
Method : SW846 6010B

Galson ID:		L53106-1	WG15953-1
Client ID:		RW13/RW1R	Laboratory Blank 1
	Units		
Copper	mg/l	<0.01	<0.01
Iron	mg/l	0.53	<0.1
Inorganic Lead	mg/l	<0.003	<0.003
Nickel	mg/l	<0.02	<0.02
Zinc	mg/l	<0.01	<0.01

pH (FIELD) = 7.22

Approved by : KSB
Date : 11-AUG-99
QC by : [signature]
Date : 8/11/99
NYS DOH # : 11626
Footnotes:

INORGANIC ANALYTICAL REPORT

Galson Laboratories

Client : Blasland, Bouck & Lee
Account # : 10624
Site : SRSNE

Date Received : 29-JUL-99 Matrix : Water
Date Sampled : 28-JUL-99

			Galson ID: L53106-1	Client ID: RW13/RW1R
	Method	Units		
T. Suspended Solids	EPA 160.2	mg/L	<4	

Approved by : LM
Date : 03-AUG-99
QC by : [signature]
Date : 8/19/99
NYS DOH # : 11626
Footnotes:
Analysis Date: 8/2/99

Appendix B

Scope of Work, Including Plans and Specifications

Scope of Work
Extraction Wells RW-13 and RW-1R
Tie-Ins

Solvents Recovery Service of New England Site
Southington, Connecticut

Prepared For:
SRSNE PRP Group

November 1999

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

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

Table of Contents

1. Information to Bidders

1.1 Introduction

This document presents the scope of work for completing the installation of a bedrock ground-water extraction system to the southeast of the Operations Area at the Solvents Recovery Service of New England Site (SRSNE Site) in Southington, Connecticut. This scope of work was prepared on behalf of the SRSNE Potentially Responsible Party (PRP) Group.

1.1.1 Background

The SRSNE Site is located on approximately 14 acres of land on Lazy Lane in the town of Southington, Connecticut. The current property was developed as two distinct areas with separate operating histories. A portion of the property was used as a solvent recycling facility. This portion of the SRSNE Site is on the west side of the Boston and Maine (B&M) railroad tracks and is identified as the Operations Area (see Design Drawing 1). The remaining portion of the SRSNE Site lying to the east of the railroad tracks and west of the Quinnipiac River was used by Cianci Construction Company for storage of construction equipment and for truck washing from 1969 to 1988. This area is referred to as the former Cianci property.

In 1955, SRS, Inc. began operating a solvent recycling facility in the Operations Area. Starting in 1960, this facility was operated by SRSNE, Inc. From 1955 until 1988, the primary activities in the Operations Area were the distillation of spent solvents for recovery and resale. From 1988 until 1991, the primary activities in the Operations Area were fuel blending and waste transfer operations. In 1991, SRSNE, Inc. was forced to discontinue operating because it failed to satisfy the conditions of its permit to operate a Treatment, Storage, and Disposal Facility under the Resource Conservation and Recovery Act (RCRA).

In 1994, the SRSNE PRP Group initiated activities under Non-Time-Critical Removal Action No. 1 (NTCRA 1) at the site. NTCRA 1 involved primarily design and construction of an overburden ground-water containment and treatment system in the Containment Area hydraulically downgradient (east) of the SRSNE Operations Area. The NTCRA 1 ground-water containment and treatment system has been in operation since July 1995.

In 1996, the SRSNE PRP Group initiated activities under a second NTCRA (NTCRA 2) at the site. NTCRA 2 involves primarily design and implementation of a ground-water extraction system to minimize the migration of ground water in the bedrock from the Operations Area at the site. NTCRA 2 assumes that the ground water extracted by the NTCRA 2 extraction system will be treated using the treatment system that was designed and constructed for NTCRA 1, which is located on the former Cianci property.

1.1.2 Scope of Work

This document covers the implementation of a ground-water extraction system under NTCRA 2. The mechanical, electrical, and site work associated with the implementation of the bedrock ground-water extraction system includes but, is not limited to, the following (see Design Plans and Specifications on Figures 1 through 5).

Work Completed in June/July 1999

- Provide and install well pump, piping, valves, and pressure transducer at existing extraction well RW-13 in accordance with Sheet 2 -Extraction Well RW-13 and RW-1R Installation Details.

- Provide and install local control panel at well RW-13 in accordance with Sheet 4 - Extraction Well RW-1R Control Details and Sheet 5 - Miscellaneous Details.

- Provide necessary power connections to well RW-13 control panel from the existing treatment building in accordance with Sheet 3 - One-Line Diagram, Sheet 4 - Extraction Well RW-1R Control Details, and Sheet 5 - Miscellaneous Details.

- Provide and install 4-inch-diameter high density polyethylene (HDPE) pipe, #2 aluminum cable, and a 3-inch-diameter polyvinyl chloride (PVC) conduit within a trench from well RW-13 to the existing treatment building in accordance with Sheet 1 - Site Plan, Sheet 2 - Extraction Well RW-13 and RW-1R Installation Details, and Sheet 5 - Miscellaneous Details.

- Connect 4-inch-diameter HDPE pipe to inlet to equalization tank through a floor penetration at the existing treatment building in accordance with Sheet 5 - Miscellaneous Details.

- Provide and install chain link fence around well RW-13 in accordance with Sheet 1 - Site Plan.

Work to be Completed

- Provide and install well pump, piping, valves, pressure transducer, and pressure gauge at existing bedrock groundwater extraction well RW-1R in accordance with Sheet 2 - Extraction Well RW-13 and RW-1R Installation Details.

- Provide and install local control panel at well RW-1R in accordance with Sheet 4 - Extraction Well RW-1R Control Details and Sheet 5 - Miscellaneous Details.

- Provide necessary control wiring connections to well RW-13 control panel from the existing treatment building in accordance with Sheet 3 - One-Line Diagram, Sheet 4 - Extraction Well RW-1R Control Details, and Sheet 5 - Miscellaneous Details.

- Provide necessary power and control wiring connections to well RW-1R control panel from the well RW-13 control panel in accordance with Sheet 3 - One-Line Diagram, Sheet 4 - Extraction Well RW-1R Control Details, and Sheet 5 - Miscellaneous Details.

- Provide and install 1-inch-diameter PVC pipe from the outlet of well RW-1R well pump to well RW-13 in accordance with Sheet 2 - Extraction Well RW-13 and RW-1R Installation Details.

1.2 General Conditions

1.2.1 Construction Review and Changes

Construction activities will be reviewed by representatives of the SRSNE PRP Group. Any changes from this document or claims for extra work must be submitted to representatives of the SRSNE PRP Group in advance of performing said work or payment will be denied.

1.2.2 Construction Schedule

This project is expected to be completed in 2000, within 45 days of notice to proceed.

1.2.3 Construction Survey Control

The Contractor shall perform the initial baseline and construction layout survey, as well as the final as-built survey.

1.2.4 Protection of Material and Work

All work and material of every description provided for by this document, susceptible to damage during construction, shall be fully protected by the Contractor against damage from any source. If, at any time during the execution of the work, any part shall be susceptible to damage from the weather or construction activity, the Contractor shall provide protection as the representatives of the SRSNE PRP Group may deem advisable, without extra expense to the SRSNE PRP Group.

The Contractor performing the work shall store their materials on arrival at a location designated by representatives of the SRSNE PRP Group and shall protect them and surrounding areas from damage during storage and during construction.

The Contractor shall be held responsible for the protection and safekeeping of any and all materials. They shall be obligated to make good or replace any materials or work, without expense to the SRSNE PRP Group, because of injury or damage which said materials or work may sustain from any cause whatsoever, including theft, before final acceptance of the work.

1.2.5 Use of Premises

The Contractor will be responsible for providing construction trailers or their equivalent for storage of materials, apparatus and equipment when not in use. During the working period, the Contractor shall confine his apparatus, equipment, storage of materials, and operation of his workmen, to the general work area or other areas designated for Contractor use by representatives of the SRSNE PRP Group.

1.2.6 Cleaning

The Contractor shall at all times keep the general work area and the adjoining premises, driveways, and streets clean of rubbish caused by the Contractor's operations and, at the completion of the work, shall remove all the rubbish, all of their tools, equipment, temporary work and surplus materials from and about the premises, and shall leave the work area clean and ready for use. If the Contractor does not attend to such cleaning with reasonable promptness upon request, representatives of the SRSNE PRP Group may cause such cleaning to be done by others and charge the cost of the same to the Contractor.

1.2.7 Sanitary Facilities

Sanitary facilities for construction personnel shall be provided by the SRSNE PRP Group in the existing treatment building.

1.2.8 Contractor's Responsibility and Liability for Injuries to Persons or Damage to Property

The Contractor shall be solely responsible and liable for the health, safety and protection of property including, but not limited to, the premises, its appurtenances and equipment, and for the health, safety and protection of all persons including, but not limited to, the employees of the Contractor or Subcontractors and representatives of the SRSNE PRP Group. The Contractor shall be solely responsible for all physical illness and injuries, including death, to any such persons and for all damage to any such property occurring on account of the work hereunder, whether or not due to the negligence, fault, or default of the Contractor, his officers, employees, or agents, or of a Subcontractor, his officers, employees, or agents.

The liability of the Contractor under this Contract shall be absolute and shall not be dependent upon any question of negligence on his part or on the part of his officers, agents, servants or employees.

1.2.9 Contractor's Duty of Indemnification

The Contractor shall fully protect, defend, indemnify, and save harmless the SRSNE PRP Group, their officers and agents, against all liability, judgments, costs, damages, and expenses including reasonable attorney's fees upon any claims for illness or injuries to, or death of, any persons or damage to any property occurring on account of the work hereunder, whether such damages or injuries to be attributable to the negligence of the Contractor, their officers, employees, agents, representatives of the SRSNE PRP Group, or others.

The Contractor shall fully protect, defend, indemnify, and save harmless the SRSNE PRP Group against all liability judgments, costs, damages, and expense including reasonable attorney's fees upon all claims relating to labor and material furnished in connection with the work hereunder, or on account of failure, omission, or neglect of the Contractor or their Subcontractor, their officers, employees, or agents to do or perform any of the covenants, acts, matters, or other duties required hereunder.

1.3 Examination of Site

Prior to bid submittal, all Bidders shall visit the SRSNE Site. By submitting a bid, the Bidder agrees that he has visited the site and examined this document and is familiar with the conditions and requirements of all of them and guarantees the adequacy and sufficiency of this document to accomplish the required results in a first class manner. It is the Bidder's responsibility to notify representatives of the SRSNE PRP Group of any conflicts, omissions, or ambiguities which would interfere with the quality or constructability of the proposed work.

The Bidder shall notify representatives of the SRSNE PRP Group no later than three days before the bid submittal date of any requests for interpretation or clarification of this document. All interpretations will be issued to all Bidders in the form of an addenda.

1.4 Qualifications of Bidders

The SRSNE PRP Group shall conduct all necessary investigation to determine the experience and capabilities of prospective Bidders. Bidders shall submit appropriate qualifications with their bid proposal to assist the SRSNE PRP Group in evaluating the Bidder's experience. The SRSNE PRP Group reserves the right to reject any bid if the Bidder fails to satisfy the SRSNE PRP Group that such Bidder is properly qualified to carry out the obligations of the Contract and to complete the work as specified.

1.5 Addenda and Interpretations

No oral interpretations of this document will be made by representatives of the SRSNE PRP Group. All requests for interpretation should be made in writing and addressed to representatives of the SRSNE PRP Group. Any addenda issued by representatives of the SRSNE PRP Group shall become part of this document and shall be acknowledged on the bid submittal.

1.6 Submission of Bids

All Bidders must submit their proposal on the specified Bid Form (bound separately). Included with the bid form shall be a project schedule that shall include the expected start date, duration, and completion dates. The project schedule format should be in the form of a bar graph (i.e., Gantt chart).

Bids submitted must cover the entire cost of the scope of work described herein. The bid price for each item shall cover the entire cost, including all materials (unless otherwise designated), workmanship, and appurtenances necessary for a complete job.

1.7 Rejection of Bids

The SRSNE PRP Group reserves the right to reject any and all bids received. The SRSNE PRP Group also reserves the right to receive any and all bids, in any form they may be, and to waive any informalities in said bids; or to award the work to whichever Bidder it may be considered advantageous to do so, regardless of bid price.

1.8 Special Conditions

1.8.1 Scope of Work

The work shall confirm to the scope of work described herein.

1.8.2 Permits, Codes, and Regulations

The Contractor shall secure all necessary permits required for the execution of this Contract. All work shall be performed in accordance with local, state, and federal regulations and codes.

1.8.3 Insurance

Prior to the award of this project, the successful Bidder must submit a certificate of insurance to demonstrate insurance coverage specified in the Contract provided by the SRSNE PRP Group (bound separately).

1.8.4 Payments

Payment requests may be submitted at a minimum of monthly (every four weeks) intervals. Payment for materials on site will be made to the Contractor if representatives of the SRSNE PRP Group are provided with receipted invoices for those materials.

1.8.5 Facility Access

Access shall be maintained for purposes of the scope of work described herein. The Contractor's activities will be limited to the immediate work areas; vehicles shall be parked in areas designated for Contractor use by the representatives of SRSNE PRP Group.

1.8.6 Pre-Bid and Pre-Construction Meeting

Prior to the date of submission of bids, a pre-bid meeting will be scheduled with representatives of the SRSNE PRP Group and each prospective Bidder. The meeting will allow the prospective Bidders to ask questions regarding specific points related to the project. As part of the pre-bid meeting, a site review will be conducted. All Contractors are required to have a representative attend the pre-bid meeting and visit the site. An addendum shall then be formally prepared and issued (if necessary) to clarify any pertinent points discussed at the meeting.

Prior to the start of construction by the successful Bidder, a general information meeting shall be held with representatives of the SRSNE PRP Group. The meeting shall cover final arrangements prior to proceeding with the work described herein.

1.8.7 Health and Safety

Prior to the pre-construction meeting, the successful Bidder is required to submit a written site-specific Health and Safety Plan (HASP) to representatives of the SRSNE PRP Group defining all safety precautions and programs to

be implemented by the Contractor while performing project work. The HASP must, at a minimum, meet the requirements outlined in the NTCRA 2 Statement of Work (bound separately). In addition, the Contractor shall not initiate field work and/or construction activity until such time as its HASP has been reviewed by representatives of the SRSNE PRP Group.

The Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. He shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to all employees on the work, and any other persons who may be affected thereby.

The Contractor shall comply with all applicable laws, ordinances, rules, regulations, and orders of public bodies having jurisdiction for the safety of persons or property or to protect them from damaged, injury, or loss, including, without limitation, the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596), under Section 107 of the Contractor Work Hours and Safety Standards Act (PL 91-54), and in accordance with 29 CFR 1910. The Contractor shall erect and maintain as required by the conditions and the progress of the work, all necessary safeguards for the safety and protection, and shall comply with all applicable recommendations of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc.

The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's Superintendent unless otherwise designated in advance, in writing, by the Contractor to representatives of the SRSNE PRP Group.

The Contractor shall also comply with all safety and protection provisions in the Special Conditions. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his equipment, appliances, and methods.

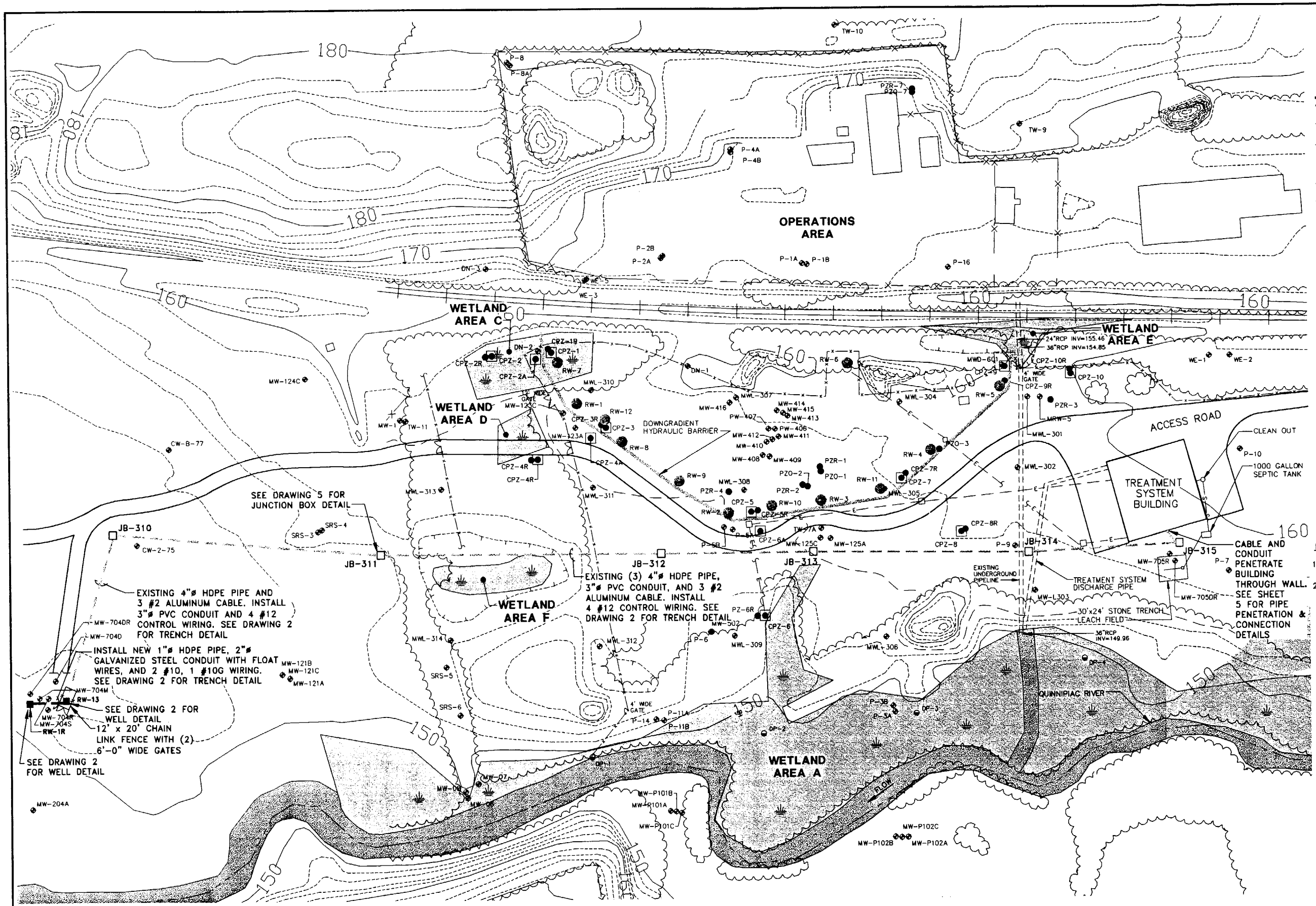
1.8.8 Submittals

The successful bidder must submit to representatives of the SRSNE PRP Group the required submittals for all materials including mechanical and electrical equipment included in this scope of work. Failure to submit the required materials within the specified time frame may constitute grounds for project/construction dismissal at no cost to the SRSNE PRP Group.

1.8.9 Dust Control

The contractor will be responsible for implementing dust control procedures to the satisfaction of representatives of the SRSNE PRP Group. All construction work/activity will be performed in a manner which minimizes the potential for the generation of dust. The use of excessive amounts of water to control dust will not be allowed, however, fine water spray misting is acceptable in controlling dust.

FIGURES



NOTES:

1. SITE PLAN TAKEN FROM BLASLAND, BOUCK AND LEE, INC. RECORD DRAWING G-1, DATED 8/95.
2. THE LOCATIONS OF EXISTING DRIVE POINTS, WELLS AND PIEZOMETERS ARE APPROXIMATE ONLY.

L: ON=*, OFF=*REF*
P: CONT-DJD/CONT-MVB
11/4/99 SYR-54-DCC KMD DCC
08331013/08331G03.DWG

Graphic Scale
1" = 50'
50' 0 50' 100'

No.	Date	Revisions	Init

Project Mgr. _____
Designed by _____
Drawn by _____
Checked by _____
Prof. Eng. _____
PE License _____

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

SRSNE PRP GROUP • SOUTHINGTON, CONNECTICUT
NON-TIME-CRITICAL REMOVAL ACTION 2 SRSNE SITE
EXTRACTION WELLS RW-13 & RW-1R TIE-INS

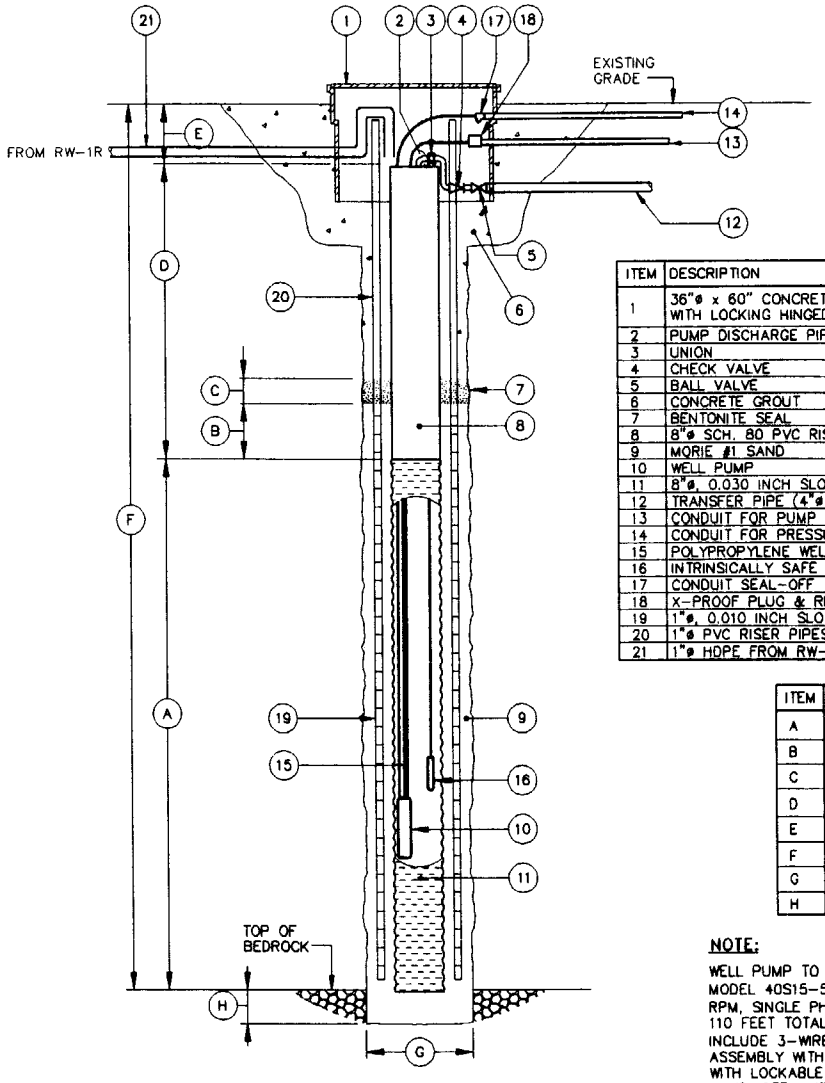
EXISTING SITE PLAN

File Number
083.31.XXF

Date
NOVEMBER 1999

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

1

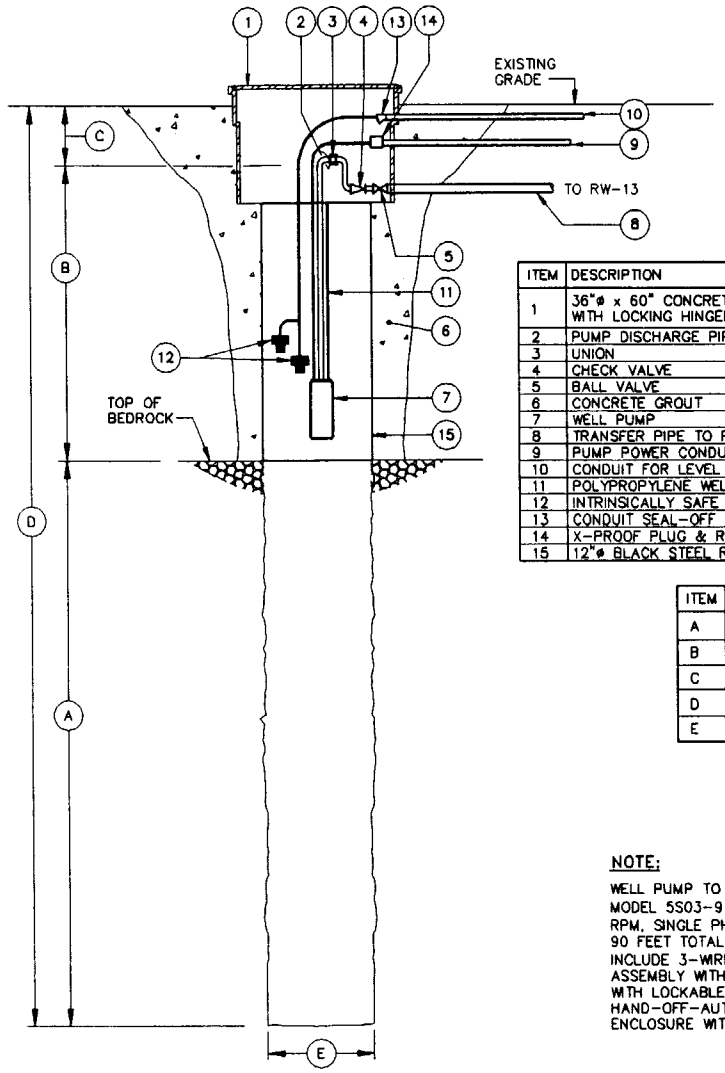


ITEM	DESCRIPTION
1	36"ø x 60" CONCRETE MANHOLE ASSEMBLY WITH LOCKING HINGED STEEL COVER
2	PUMP DISCHARGE PIPE (2"ø PVC)
3	UNION
4	CHECK VALVE
5	BALL VALVE
6	CONCRETE GROUT
7	BENTONITE SEAL
8	8"ø SCH. 80 PVC RISER
9	MORIE #1 SAND
10	WELL PUMP
11	8"ø, 0.030 INCH SLOT STAINLESS STEEL SCREEN
12	TRANSFER PIPE (4"ø HDPE)
13	CONDUIT FOR PUMP POWER
14	CONDUIT FOR PRESSURE TRANSDUCER
15	POLYPROPYLENE WELL ROPE (CONNECT TO PUMP)
16	INTRINSICALLY SAFE PRESSURE TRANSDUCER
17	CONDUIT SEAL-OFF
18	X-PROOF PLUG & RECEPTACLE W/CONDUIT SEAL
19	1"ø, 0.010 INCH SLOTTED PVC PIPES (3)
20	1"ø PVC RISER PIPES (3)
21	1"ø HDPE FROM RW-1R

ITEM	DIMENSION
A	40'-0"
B	5'-0"
C	3'-0"
D	34'-0"
E	1'-0"
F	75'-0"
G	1'-4"
H	2'-10"

NOTE:

WELL PUMP TO BE GRUNDFOS ENVIRONMENTAL MODEL 40S15-5 (1-1/2 HP, 230 VOLT, 3450 RPM, SINGLE PHASE) CAPABLE OF 30 GPM AT 110 FEET TOTAL DYNAMIC HEAD. PACKAGE TO INCLUDE 3-WIRE WITH GROUND PUMP/MOTOR ASSEMBLY WITH LEADS AND CONTROL BOX WITH LOCKABLE DISCONNECT SWITCH AND HAND-OFF-AUTO SWITCH IN A NEMA 4 ENCLOSURE WITHIN A LOCKABLE CABINET.



ITEM	DESCRIPTION
1	36"ø x 60" CONCRETE MANHOLE ASSEMBLY WITH LOCKING HINGED STEEL COVER
2	PUMP DISCHARGE PIPE (1"ø PVC)
3	UNION
4	CHECK VALVE
5	BALL VALVE
6	CONCRETE GROUT
7	WELL PUMP
8	TRANSFER PIPE TO RW-13 (1"ø HDPE)
9	PUMP POWER CONDUCTOR
10	CONDUIT FOR LEVEL PROBES
11	POLYPROPYLENE WELL ROPE (CONNECT TO PUMP)
12	INTRINSICALLY SAFE LEVEL PROBES
13	CONDUIT SEAL-OFF
14	X-PROOF PLUG & RECEPTACLE W/CONDUIT SEAL
15	12"ø BLACK STEEL RISER

ITEM	DIMENSION
A	90'-0"
B	81'-0"
C	1'-0"
D	172'-0"
E	1'-0"

NOTE:

WELL PUMP TO BE GRUNDFOS ENVIRONMENTAL MODEL 5S03-9 (1/2 HP, 230 VOLT, 3450 RPM, SINGLE PHASE) CAPABLE OF 7 GPM AT 90 FEET TOTAL DYNAMIC HEAD. PACKAGE TO INCLUDE 3-WIRE WITH GROUND PUMP/MOTOR ASSEMBLY WITH LEADS AND CONTROL BOX WITH LOCKABLE DISCONNECT SWITCH AND HAND-OFF-AUTO SWITCH IN A NEMA 4 ENCLOSURE WITHIN A LOCKABLE CABINET.

GENERAL NOTES:

1. CONTRACTORS SHALL COORDINATE ALL CONSTRUCTION ACTIVITIES WITH REPRESENTATIVES OF THE SRSNE PRP GROUP PRIOR TO COMMENCING ON-SITE ACTIVITIES.
2. CONTRACTORS SHALL VERIFY ALL DIMENSIONS IN THE FIELD.
3. CONTRACTORS SHALL PROVIDE ALL LOCAL PERMITS AND MAKE ARRANGEMENTS FOR LOCAL INSPECTIONS (AS NECESSARY).
4. CONTRACTORS SHALL INSTALL EQUIPMENT IN NEAT AND WORKMANLIKE MANNER; ALIGN, LEVEL AND ADJUST FOR SATISFACTORY OPERATION; INSTALL SO THAT PARTS ARE EASILY ACCESSIBLE FOR INSPECTION, OPERATION AND MAINTENANCE AND REPAIR. DEVIATIONS FROM INDICATED ARRANGEMENTS ARE SUBJECT TO BE REMOVED AND APPROVED BY REPRESENTATIVES OF THE SRSNE PRP GROUP PRIOR TO INSTALLATION AND/OR OPERATION.
5. CONTRACTORS SHALL FURNISH AND PLACE PROPER GUARDS FOR PREVENTION OF ACCIDENTS, PROVIDE ALL TRENCH SHORING, SCAFFOLDING, SHIELDING, DUST/FUME PROTECTION, MECHANICAL/ELECTRICAL PROTECTION, SPECIAL GROUNDING, SAFETY RAILINGS, BARRIERS, OR OTHER SAFETY FEATURES REQUIRED. CONTRACTOR SHALL PROVIDE AND MAINTAIN SUFFICIENT LIGHTS DURING NIGHT HOURS TO SECURE SUCH PROTECTION. CONTRACTORS SHALL MAINTAIN ALL SITE TRAFFIC.
6. CONTRACTORS SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS, AND ORDERS OF PUBLIC BODIES HAVING JURISDICTION FOR THE SAFETY OF PERSONS OR PROPERTY, OR TO PROTECT THEM FROM DAMAGE, INJURY, OR LOSS, INCLUDING, WITHOUT LIMITATION, THE DEPARTMENT OF LABOR SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION PROMULGATED UNDER SECTION 107 OF THE CONTRACTOR WORK HOURS AND SAFETY STANDARDS ACT (PL 91-54) AND AMENDMENTS THERETO. IT SHALL ERECT AND MAINTAIN AS REQUIRED BY THE CONDITIONS AND THE PROGRESS OF THE WORK, ALL NECESSARY SAFEGUARD FOR THE SAFETY AND PROTECTION AND SHALL COMPLY WITH ALL APPLICABLE RECOMMENDATIONS OF THE MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION OF THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.

SITE WORK NOTES:

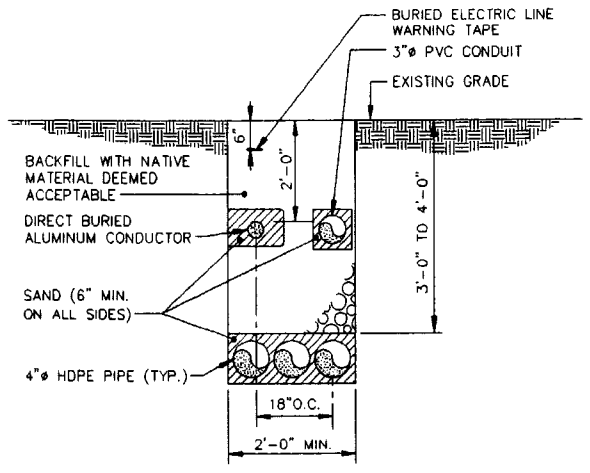
1. CONTRACTORS SHALL PLACE ALL SPOIL MATERIAL AT AN ON-SITE LOCATION AS DIRECTED BY REPRESENTATIVES OF THE SRSNE PRP GROUP.
2. CONTRACTORS SHALL FIELD VERIFY THE LOCATION OF UTILITIES IN THE FIELD PRIOR TO INITIATING WORK.
3. ALL SURFACES DAMAGED OR DESTROYED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT SHALL BE RESTORED TO THEIR PRE-CONSTRUCTION CONDITION IN A TIMELY MANNER.
4. ALL EXCAVATIONS SHALL BE OBSERVED BY REPRESENTATIVES OF THE SRSNE PRP GROUP PRIOR TO PLACING BACKFILL.
5. GALVANIZED CHAIN LINK FENCE SURROUNDING RW-13 SHALL BE A TOTAL OF 8 FEET ABOVE GROUND WITH 1 FOOT HIGH BARBED WIRE. FENCE SHALL CONSIST OF SCH. 40 GALVANIZED STEEL PIPE FOR POSTS, RAILS, AND BRACES. FABRIC SHALL BE ONE PIECE, 9 GAUGE, 2-INCH MESH WITH TWISTED AND BARBED BOTTOM WITH THREE 12 GAUGE BARBED WIRE TOP STRANDS.
6. CONTRACTOR TO PROVIDE CHAIN AND LOCK (WITH 8 KEYS) FOR LOCKING FENCE GATE.

MECHANICAL NOTES:

1. ALL ABOVE GROUND PIPING INSIDE BUILDING SHALL BE PVC SCHEDULE 80 TYPE II UNLESS OTHERWISE SPECIFIED.
2. ALL UNDERGROUND PIPES SHALL BE HDPE SDR 21 UNLESS OTHERWISE SPECIFIED.
3. ALL PVC JOINTS TO BE SOLVENT WELDED.
4. ALL HDPE PIPES SHALL BE BUTT-FUSED.
5. ALL PIPE INSIDE BUILDING SHALL BE SUPPORTED AT A MINIMUM OF 5'-0" O.C. (MAX) AND LOCATED 2'-0" (MAX) FROM JOINT LOCATIONS.
6. ALL PIPE TO BE INSTALLED AND PRESSURE-TESTED AS PER MANUFACTURER'S SPECIFICATIONS. ZERO LEAKAGE IS ALLOWED FOR ALL JOINTS.
7. ALL PIPING TO BE LABELED WITH STENCIL OR ADHESIVE. FLOW ARROWS TO BE LABELED AT INLET AND DISCHARGE CONNECTIONS. PIPING AND DESCRIPTION SHALL ALSO BE CLEARLY LABELED AT ALL VALVE INFLUENT AND APPURTENANCE LOCATIONS.
8. ALL BALL VALVES TO BE PVC DUO-BLOC, VITON SEALS, TRUE UNION OR EQUAL.
9. ALL CHECK VALVES TO BE PVC, FLANGED, SWING CHECK VALVE OR EQUAL.
10. ALL SAMPLE TAPS AND DRAIN VALVES SHALL CONSIST OF A 1/2" PIPE EXTENSION AND BALL VALVE OR EQUAL. SAMPLES TAPS AND DRAIN VALVES SHALL BE LOCATED AT LOCATIONS SHOWN ON THE DRAWINGS AND AT ALL LOW ELEVATIONS IN PROCESS PIPING.
11. FLOW METER SHALL BE A GREAT LAKES INSTRUMENTS MODEL 677F INTEGRAL MOUNT ANALOG FLOW METER/TRANSMITTER WITH 6-DIGIT TOTALIZER.
12. FLOW METER SHALL HAVE STRAIGHT PIPE PRECEDING (10 TIMES PIPE DIAMETER) AND FOLLOWING (5 TIMES PIPE DIAMETER) THEM.

EXISTING RECOVERY WELL 13 DETAIL

NOT TO SCALE



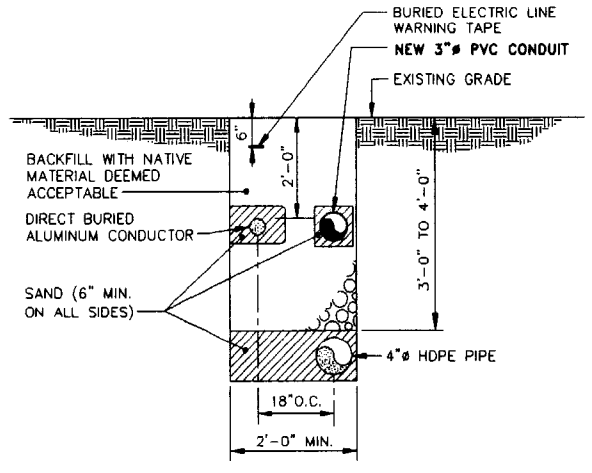
EXISTING TRENCH TYPICAL DETAIL

(TREATMENT BUILDING TO JB-310)

NOT TO SCALE

RECOVERY WELL 1R DETAIL

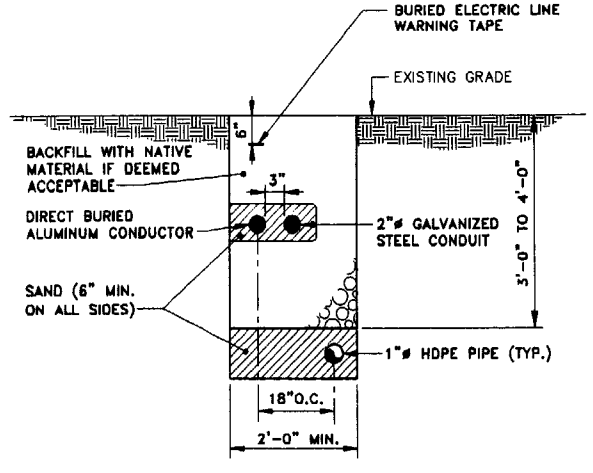
NOT TO SCALE



EXISTING TRENCH TYPICAL DETAIL

(JB-310 TO RW-13)

NOT TO SCALE



NEW TRENCH TYPICAL DETAIL

(RW-13 TO RW-1R)

NOT TO SCALE

L: ON=*, OFF=*REF*
P: CONT-DJD/CONT-MVB
11/4/99 SYR-54-DCC KMD DCC
08331013/08331G02.DWG

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NON-TIME-CRITICAL REMOVAL ACTION 2 SRSNE SITE
EXTRACTION WELLS RW-13 & RW-1R TIE-INS

EXTRACTION WELL RW-13 AND RW-1R INSTALLATION DETAILS

File Number 083.31.XXF
Date NOVEMBER 1999

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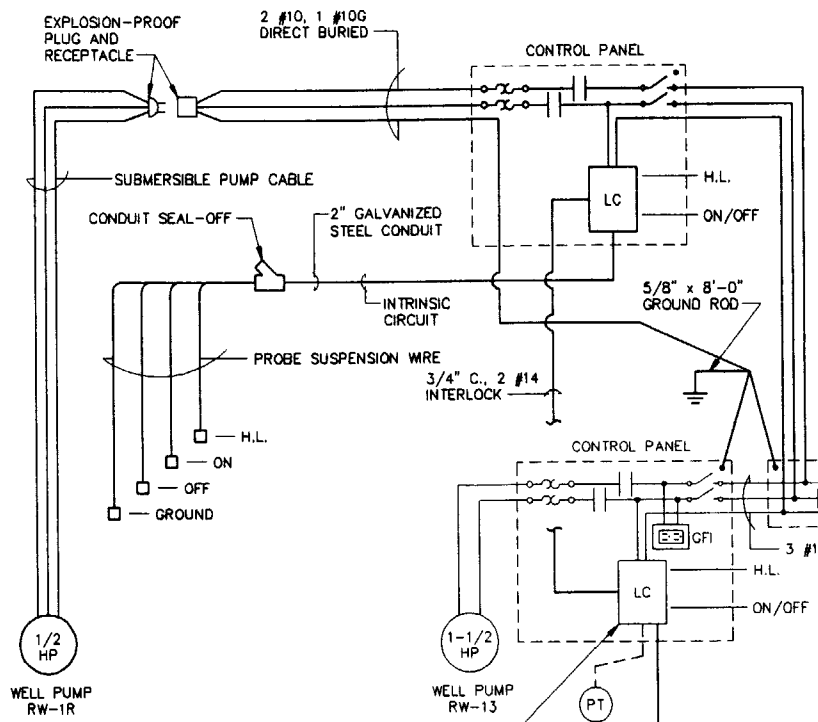

NOTE:
BOLD INDICATES NEW WORK REQUIRED AS PART OF THIS CONTRACT.

ONE-LINE DIAGRAM

NOT TO SCALE

L: ON=*, OFF=*REF*
P: CONT-DJD/CONT-MVB
10/22/99 SYR-54-DCC KMD DCC
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ONE-LINE DIAGRAM

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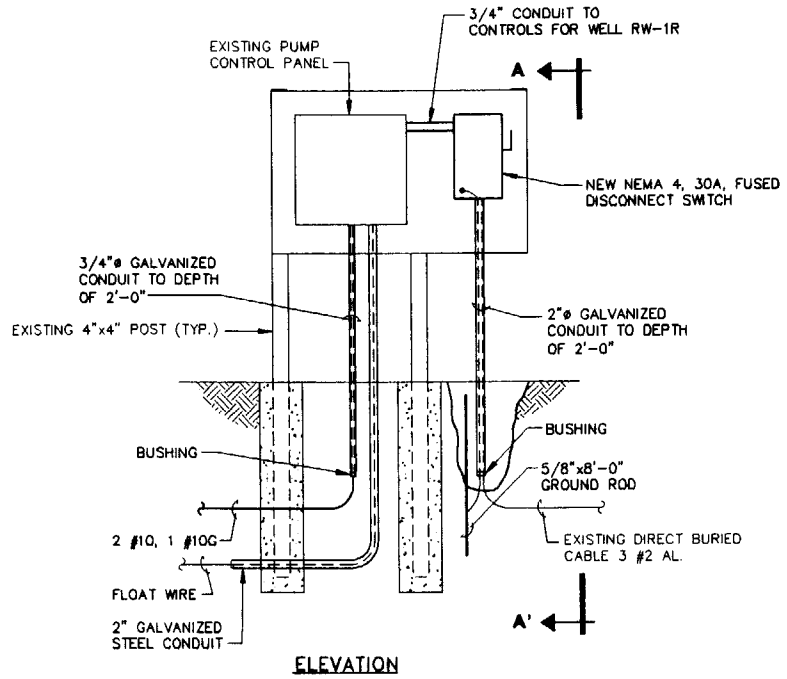
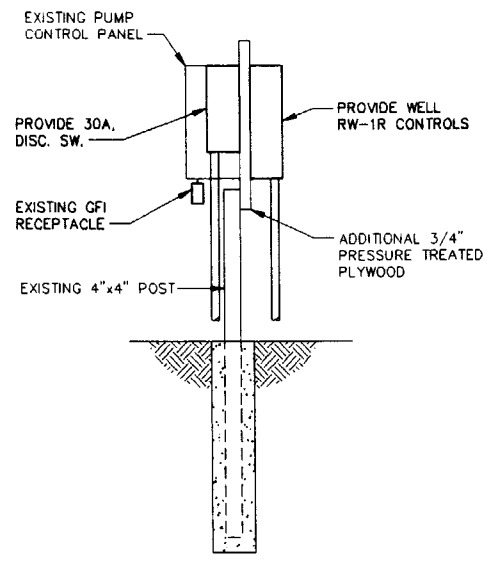


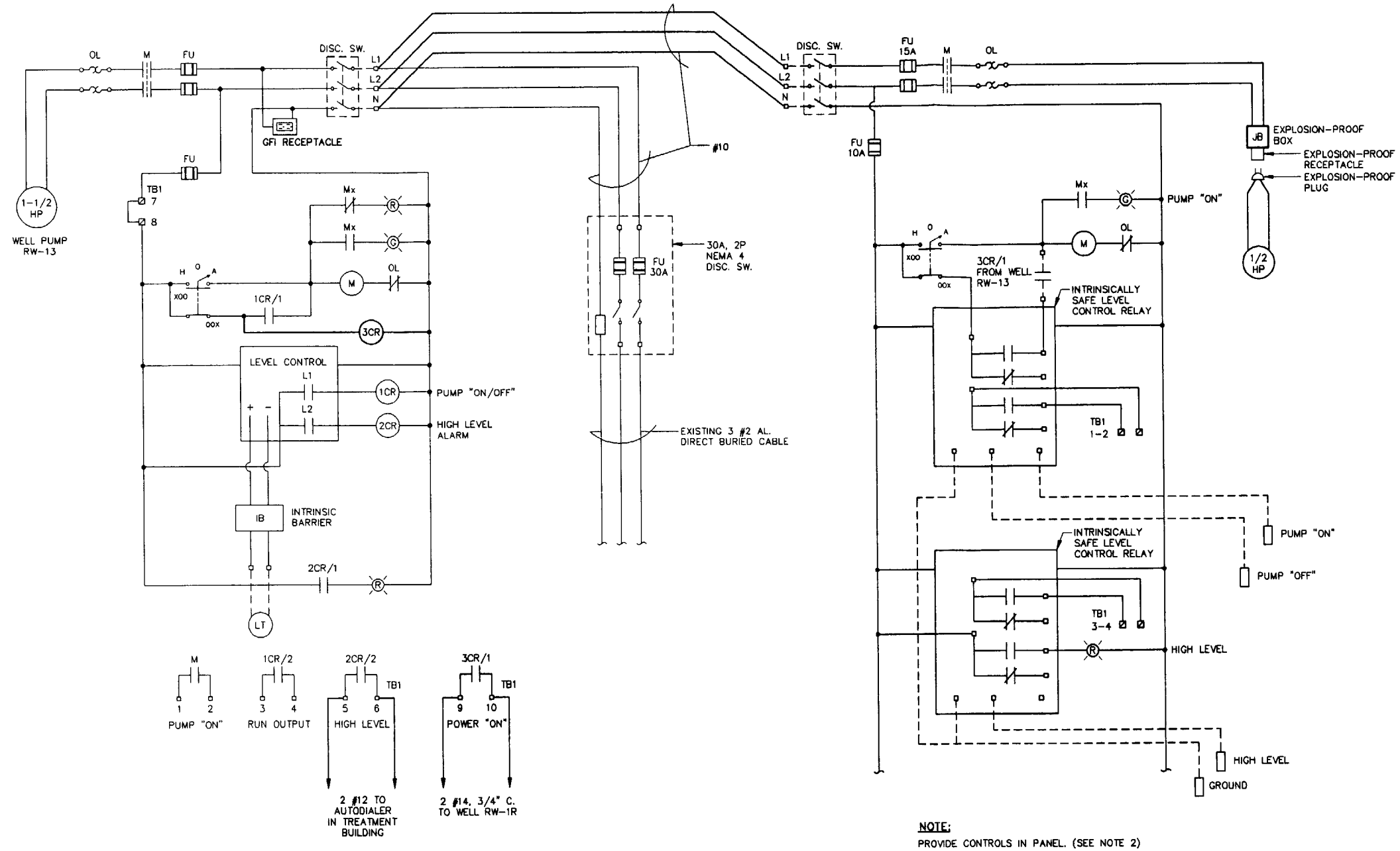
ELEVATION



SECTION A-A'

WELLS RW-13 AND RW-1R
CONTROL PANEL MOUNTING

NOT TO SCALE



EXISTING CONTROLS FOR WELL RW-13

NOT TO SCALE

NOTE:
PROVIDE CONTROLS IN PANEL. (SEE NOTE 2)

NEW CONTROLS FOR WELL RW-1R

NOT TO SCALE

ELECTRICAL NOTES:

1. ALL ELECTRICAL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF NFPA - 70, NATIONAL ELECTRICAL CODE (NEC).
2. CONTROL PANELS SHALL BE NEMA 4, STEEL, HINGED COVER, 8 INCH DEPTH BY SIZE REQUIRED; HEAVY DUTY OIL-TIGHT PUSH BUTTONS & INDICATING LIGHTS; 2 POLE, 20A DISCONNECT; WIRING TO TERMINAL STRIPS.
3. DIRECT BURIED CABLE SHALL BE 10/2 W/GRD., USE, COPPER. POWER AND CONTROL WIRE SHALL BE TYPE THHN/THWN IN SUITABLE WIREWAY.
4. INTRINSIC LEVEL CONTROLS SHALL BE B/W CONTROLS INTRINSICALLY SAFE CONTROL RELAYS CAT. NO. 5300SVOC.
5. WELL PROBES SHALL BE B/W CONTROLS TYPE E-1P, STAINLESS STEEL. FURNISH THREE SHIELDED AND ONE UNSHIELDED. FURNISH 600 FOOT ROLL OF B/W TYPE SW SUSPENSION WIRE.
6. DISCONNECT SWITCH SHALL BE 240 VOLT, HEAVY DUTY, NEMA 4, 2 POLE, 3 WIRE, SOLID NEUTRAL, RATED FOR ALUMINUM OR COPPER WIRE.
7. CONDUIT SHALL BE GALVANIZED RIDGED STEEL (RGS) CONDUIT WITH THREADED COUPLINGS UNLESS OTHERWISE NOTED.
8. EXPLOSION-PROOF PLUG AND RECEPTACLE, SHALL BE HUBBLE ACCEPTOR PLUG: NEMA 6-20P, CAT. NO. UGP 20232; RECEPTACLE: NEMA 6 -20R, CONNECTOR BODY, UGRA 20232.

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EXTRACTION WELL RW-1R CONTROL DETAILS

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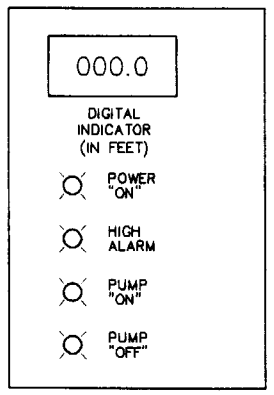
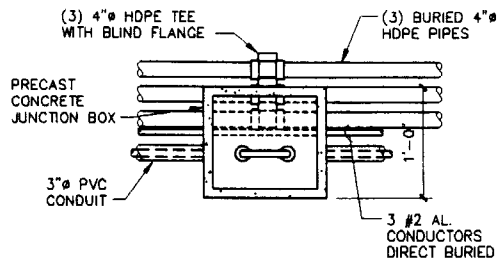


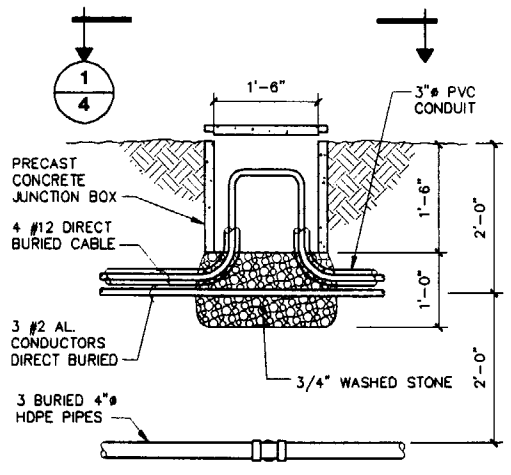
EXISTING WELL LEVEL CONTROL PANEL

NOT TO SCALE



SECTION 1/4

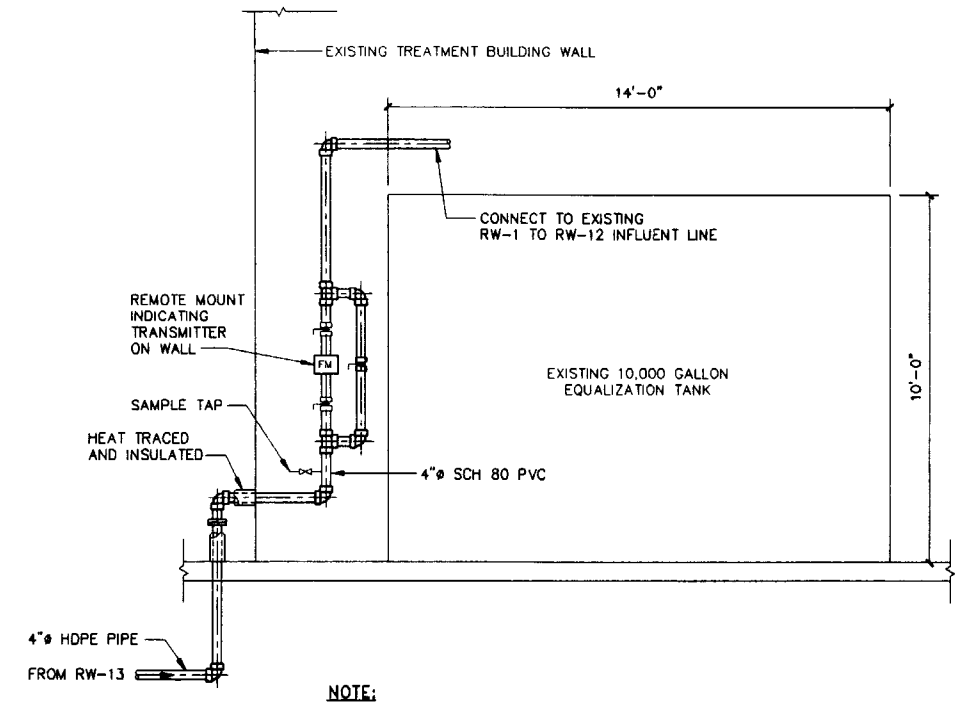
NOT TO SCALE



NOTE:
REUSE EXISTING 3 #2 AL. CABLE

EXISTING JUNCTION BOX DETAIL

NOT TO SCALE



NOTE:
TWO SPARE 4"ø HDPE PIPES TERMINATE INSIDE BUILDING.

EXISTING PIPE CONNECTION AT EQUALIZATION TANK

NOT TO SCALE

ELECTRICAL NOTES:

1. ALL ELECTRICAL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST REVISION OF THE NFPA-70, NATIONAL ELECTRICAL CODE (NEC).
2. PULL BOXES FOR OUTDOOR INGROUND USE SHALL BE 12"x18"x18" DEEP WITH COVER AND NO BASE. BOXES SHALL BE MANUFACTURED BY QUAZITE, OR EQUAL.
3. CONTROL CABLE SHALL CONSIST OF 600 VOLT, 12 AWG, CONDUCTORS CONSTRUCTED OF A MINIMUM OF SEVEN STRANDS OF UNCOATED CLASS B COPPER CONCENTRICALLY-STRANDED WIRES. EACH CONDUCTOR SHALL HAVE FLAME-RETARDANT ETHYLENE PROPYLENE INSULATION AND COLOR CODED PVC OUTER JACKET. CABLE SHALL BE MANUFACTURED BY CABLEC CORP. NO. AP63570, ROME TYPE CT-8, OR EQUAL.
4. TWISTED PAIR INSTRUMENTATION CONDUCTOR SHALL CONSIST OF TWO TWISTED STRANDS OF NO. 16 AWG, TINNED COATED COPPER STRANDED WIRES WITH AN ALUMINUM POLYESTER SHIELD AND COPPER DRAIN WIRE. EACH CONDUCTOR SHALL HAVE POLYETHYLENE INSULATION RATED FOR 600 VOLTS, AND COLOR COATED PVC OUTER JACKET. CONDUCTOR SHALL BE MANUFACTURED BY BELDEN TRADE NO. 8719, ALPHA NO. 2471, OR EQUAL.
5. INTRINSIC BARRIERS (IB) SHALL BE SUITABLE FOR USE ON CIRCUITS THAT SERVE HAZARDOUS LOCATIONS BY LIMITING THE ELECTRICAL ENERGY TO BELOW IGNITION LEVELS. RELAYS SHALL BE APPROVED BY FACTORY MUTUAL FOR USE IN CLASS I, DIV. I AREAS AND SHALL BE MANUFACTURED BY GEMS 54806, OR EQUAL.
6. ANALOG RELAYS SHALL BE USED WHERE SHOWN OR NOTED FOR INTERFACING ELECTRONIC EQUIPMENT AND LOW CURRENT DEVICES WITH OTHER CONTROLS. RELAYS SHALL BE FIELD CONFIGURABLE INPUT RANGE FOR DC CURRENT, DUAL TRIP (2SPDT, 5A). FURNISH WITH 11-PIN OCTAL BASE SOCKET WITH SCREW TERMINALS MANUFACTURED BY ACTION-PAK AP1090, OR EQUAL.
7. DIGITAL INDICATOR SHALL BE PANEL MOUNTED WITH NEMA 4X FRONT. 4-1/2 DIGIT DISPLAY LOOP POWERED AND SHALL OPERATE AT -40° TO 65°C. INDICATOR SHALL BE MANUFACTURED BY PRECISION DIGITAL MODEL 686, OR EQUAL.
8. ALL FIELD MOUNTED DEVICES (PUSH BUTTONS, SELECTOR SWITCHES, INDICATING LIGHTS) SHALL BE HEAVY-DUTY, CORROSION RESISTANT, WITH NEMA 4X OPERATOR BODIES AND MOLDED MODULAR TYPE CONTACT BLOCKS. ALL DEVICES SHALL BE CONFIGURED AS SHOWN, OR SPECIFIED. CONTACTS SHALL BE RATED 10 AMPS CONTINUOUS AT 120 VAC, 60 HZ. INDICATING LIGHTS SHALL BE WIRED FOR PUSH-TO-TEST AND SHALL BE 120 VOLT TRANSFORMER TYPE.
9. GROUND WATER LIQUID LEVEL PRESSURE TRANSDUCER SHALL BE SUITABLE FOR GROUNDWATER APPLICATIONS. OPERATING RANGE SHALL BE 0-60 psi WITH ACCURACY ± 0.5% OF SPAN. 9-32 VOLT EXCITATION AND 4-20 mA DC OUTPUT. TRANSDUCER SHALL BE HOUSED IN 316 STAINLESS STEEL. ZINC, HASTELLOY-C MATERIAL AND SHALL FEATURE A POLYURETHANE JACKET CABLE OF UP TO 85 FEET. PRESSURE TRANSDUCER SHALL BE MANUFACTURED BY SENSOTEC GW SERIES, KPSI SERIES 300S, OR EQUAL.
10. ALL PANELS SHALL HAVE PIANO HINGED, LOCKABLE DOORS. A ROLLED LIP AROUND THREE SIDES OF DOOR SHALL BE PROVIDED TO PREVENT DIRT AND LIQUID FROM ENTERING PANEL. SUBPANEL SHALL BE INCLUDED TO MOUNT ELECTRICAL EQUIPMENT. PANELS SHALL BE CONSTRUCTED OF A MINIMUM 14 GAUGE STEEL WITH 12 GAUGE STEEL SUBPANEL. PANELS SHALL BE 24"H x 20"W x 8"D NEMA 4 MANUFACTURED BY HOFFMAN A-24H20BLP, OR EQUAL.
11. DISCONNECT SWITCHES AS NOTED SHALL BE NEMA HEAVY-DUTY TYPE HD, UNDERWRITERS LISTED (UL). ALL SWITCHES SHALL HAVE SWITCH BLADES WHICH ARE FULLY VISIBLE IN THE "OFF" POSITION WHEN THE DOOR IS OPEN. LUGS SHALL BE (UL) LISTED FOR ALUMINUM AND/OR COPPER CABLES AND FRONT REMOVABLE. SWITCH MECHANISMS SHALL BE QUICK-BREAK OPERATING HANDLE WHICH SHALL BE AN INTEGRAL PART OF THE BOX, NOT THE COVER. SWITCHES SHALL HAVE INTERLOCK TO PREVENT UNAUTHORIZED OPENING OF SWITCH DOOR WHEN IN THE "ON" POSITION. DISCONNECT SWITCHES SHALL BE RATED AS NOTED AND MUST HAVE A (UL) LISTED REJECTION FEATURE TO REJECT ALL FUSES EXCEPT CLASS R. (UL) LISTED SHORT CIRCUIT RATING, WHEN EQUIPPED WITH FUSES, SHALL BE 200,000 AMPERES RMS SYMMETRICAL. MANUFACTURED BY SQUARE D CO., OR EQUAL.
12. FUSES SHALL BE FURNISHED AND INSTALLED FOR ALL SWITCHES AND ELECTRICAL DEVICES WITH FUSE HOLDERS. FUSES FOR USE ON INSTRUMENT AND CONTROL CIRCUITS SHALL BE FAST ACTING 1/4" x 1-1/4" GLASS TUBE FUSES. FUSES FOR USE ON MOTOR BRANCH CIRCUITS SHALL BE DUAL ELEMENT CLASS R FUSES: BUSSMAN FRN-R, GOULD-SHAWMUT TYPE TR, OR EQUAL.

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NON-TIME-CRITICAL REMOVAL ACTION 2 SRSNE SITE
EXTRACTION WELLS RW-13 & RW-1R TIE-INS

MISCELLANEOUS DETAILS

File Number 083.31.XXF
Date NOVEMBER 1999

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
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Appendix C

NTCRA 2 Demonstration of Compliance Plan

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.
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Syracuse, New York, 13214-0066
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Table of Contents

1. Introduction

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 down-time 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.

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. → actually list for future reports.

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

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

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.

STUDY AREA

HART ROAD

IVA DR

HART STREET

KANE STREET

CURTISS STREET

BOSTON & MAINE RAILROAD

SRSNE OPERATIONS AREA

PRODUCTION WELL NO. 6

NTCRA 1 CONTAINMENT AREA

FORMER CIANCI PROPERTY

TOWN WELL FIELD PROPERTY

TOWN WELL FIELD PROPERTY

PRODUCTION WELL NO. 4

CL & P EASEMENT

LAZY LANE

NORTH MAIN STREET

QUINNIPIAC RIVER

(CONN. ROUTE 10)

QUEEN STREET

FRANKLIN STREET

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, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

Original includes color coding.

0 300' 600'

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
NTCRA 2
DEMONSTRATION OF COMPLIANCE PLAN

SITE PLAN

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 1

X: 08551XCT
L: ONEFLOFF-REF\100_DESIGN
P: DJBOBREF.PCP
10/11/99 SYR 54 CBV
08551012/08551B04.DWG

Original includes color coding.

ESTIMATED NTCRA 2 CONTAINMENT AREA BOUNDARIES IN SHALLOW BEDROCK AND DEEP BEDROCK

ESTIMATED NTCRA 1 BEDROCK CONTAINMENT AREA

OPERATIONS AREA

NTCRA 1 CONTAINMENT AREA

NTCRA 1 TREATMENT SYSTEM BUILDING

FORMER IDEAL FORGING

NOTE:

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

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)

0 300' 600'

X: 08331X02
P: STD-DL.PCP ● E-SIZE OR D.JB.PCP
L: ON=*;OFF=REF* *X02PH *X02TR*
10/18/99 SYR-54-CBM KMD RCA
08331012/08331W01.DWG

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
NTCRA 2
DEMONSTRATION OF COMPLIANCE PLAN

CONTAINMENT SYSTEM AND HEAD MONITORING LOCATIONS

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 2